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Determinants of Profitability of Commercial Banks in Zambia

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Abstract
The aim of this study was to determine the main determinants of profitability of commercial banks in Zambia. The study is important because it establishes, based on empirical evidence, the extent to which the generally identified factors of profitability in banks impact bank profitability in Zambia.This study is the first documented scientific effort to determine the key determinants of profitability of commercial banks in the country.Using panel data compiled by the banking regulator in Zambia for 15 commercial banks, we computed the return on average assets (ROAA) as a measure of bank profitability, the dependent variable. Measures for independent variables namely asset size, loan loss provisioning, cost to income ratio, liquidity, non-interest income and foreign exchange income ratio were also computed.We also analysed the impact of macroeconomic variables namely GDP growth, inflation and interest rates, on bank profitability.Fixed effects modeling with dummy variables was then used to analyse the panel data for 12 years from 2010 to 2021 for 15 of the 18 commercial banks operating in Zambia.Based on the results of the study, we conclude that asset size, loan loss provisioning, cost efficiency, liquidity, non-interest income and foreign exchange income impacted bank profitability. We do not find adequate evidence to support the notion that macroeconomic variables are key determinants of bank profitability in Zambia. We conclude from the study that for banks to improve their profitability, management should focus on ensuring cost efficiency and high quality of the loan book. The regulatory authority also must check and ensure that commercial banks have adequate and satisfactory systems to ensure cost efficiency and loan book quality for sustained profitability and contribute to enhanced financial system stability.
Keywords: Bank size, commercial bank, cost efficiency, loan loss provisioning, profitability, Zambia
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1. Introduction

The aim of this study was to find out the main determinants of profitability of commercial banks in Zambia. This study is important because it establishes the extent to which the generally identified factors of profitability in banks impacted banks in the country.

To execute the study, we computed the return on average assets (ROAA) as a measure of bank profitability, the dependent variable. We further computed measures for independent variables namely bank asset size (SIZE), cost efficiency ratio (CER), loan loss provision ratio (LLPR), liquidity ratio (LIQR), diversification (DIV) measured by the total non-interest income ratio, foreign exchange income ratio (MKTR), GDP growth (GDP), inflation rate (INF), and interest rate (INT). Fixed effects regression modeling with dummy variables was then used to analyse panel data for 15 of the 18 commercial banks for the 12-year period from 2010 to 2021.

Based on our findings, we conclude that asset size, loan loss provisioning, cost to income ratio, liquidity, non-interest income and foreign exchange income impacted bank profitability. However, we did not find adequate evidence to support the notion that GDP growth, inflation and interest rates are key determinants of bank profitability in Zambia.

The remainder of the paper is organised as follows. Section 2 provides a brief review of the prior literature, while the methodology and dataset are described in Section 3. Empirical results are presented in Section 4, and Section 5 offers concluding remarks and implications for policy formulation.

2. Literature Survey

Profitability is a critical measure of stewardship success of any commercial bank. Determining factors that contribute to profitability can help banks improve their operations and make informed business decisions. Several studies have been conducted to identify determinants of profitability in commercial banks world over. The studies have focused on bank specific factors, industry factors as well as macroeconomic factors that impact bank profitability. Prior studies have also done single country analysis as well as panel country studies. This literature review finds that several studies have convergence on the direction of effect that some determinants seem to have on bank profitability. However, there is dichotomy on the impact that other factors have on bank profitability, with some studies finding positive impact while other studies find negative impact on bank profitability for the same factors.

This literature review aims to synthesize the findings of previous research studies to provide a comprehensive overview of the factors that influence the profitability of commercial banks. In this regard, the

review has synthesized literature from a broad spectrum of publications from around the world including in Asia, Africa, South America, Europe and North America. There seems to be no published literature specifically on factors affecting profitability of commercial banks in Zambia, though some unpublished literature is available.

2.1 Bank specific factors

Bank size measured by various measures such as asset size, deposit base, and capital position is a key variable in bank performance. We obtain mixed results from the literature. Bank size measured by total assets is found positively impacting bank profitability by many researchers (Elshady, 2018; Tilahun, 2017; Karim, 2013; Kusa, 2013; Kusi, 2013; Kamanidin, 2012; Davydenko, 2011; and Flamini, 2009). Conversely, Jigeer (2023) and Naceur (2008) find a negative relationship between bank asset size and bank profitability, while Ranajee (2018) and Athanasoglou (2006) find that bank assets size does not have any impact. Sufian (2009) finds conflicting impacts depending on which measure of profitability is applied among return on equity (ROE), return on assets (ROA) and Net Interest Margin (NIM). He finds that bank asset size is positively related to profitability when ROA and NIM are used and is negative with ROE as a measure of bank profitability. Mwangi, (2018) undertook a study with an objective to establish the effect asset size has on the profitability of commercial banks in Kenya. He found size to have a positive effect on financial performance of commercial banks in Kenya. In addition, he found that the effect was stronger the larger the commercial bank. He does not however attribute any reason for this phenomenon.

Capital position of a commercial bank is one factor that most studies find significantly impacting profitability in commercial banks. Mixed results have been reported with respect to the effect of capital on bank profitability (Aggarwal, 1998). Some studies have reported a positive impact of capital on bank profitability; (Huizinga, 2000), (Berger, 1995), (Dahl., 1992), and (Pettway, 1976). Karim (2013) also found that capital significantly positively impacted bank profitability in his study; so did other studies: (Elshady, 2018; Ranajee, 2018; Shuremo, 2016; Kusa, 2013; Kamarudin, 2012; Sufian, 2012; Bourke, 1988). Jigeer (2023) finds capital to be positively impacting bank profitability only when profitability is measured using ROA. When he used ROE as the measure, he found capital to be negatively impacting bank profitability in China. Still others find a negative relationship between bank capital and profitability which may refer to what has been defined as the moral hazard hypothesis whereby banks may have an incentive to abuse the deposit insurance scheme where available; (Aslı Demirgüç-Kunt, 2002), (Nigro, 1997), Brewer and Lee (1986), and Jahankhani and Lynge (1980).

Asset quality is another factor found to affect bank profitability. Asset quality is measured by the level of nonperforming loans as a ratio of the total loan base. Alternatively, asset quality can be measured by the size of the loan loss provision. Engel (1996) studied the impact of loan loss provisions (LLPs) on bank profitability. The study finds that LLPs are significantly related to future earnings. The result suggests that LLPs are a significant and better predictor of the future earnings of banks than other accounting measures.

Ryan (1995) studied the effect of bank loan portfolio composition on the market reaction to and anticipation of LLPs, while Waylen (1994) studied the informational value of loan loss provisions. These studies found that loan loss provisions are informative about the future profitability of banks.

Other studies used the level of non-performing loans to study the impact of asset quality on bank profitability and found that the level of non-performing loans was inversely related to bank profitability. This means that high quality of assets positively impacted bank profitability. These studies include those by Jigeer, (2023); Ramajee, (2018); Yilmaz, (2014); Shuremo, (2012); Davydenko, (2011); Wanzenried, (2011); Flamini, (2009); Sufian, (2009); Maimbo, (2002); and Young, (1997).

It would appear, unsurprisingly, that more cost-efficient banks tend to be more profitable than the less cost-efficient ones owing to cost savings. However, Jigeer (2023) found cost to income ratio to be negatively related to bank profitability in China, while Aysan 2007 found no impact. On the other hand, other researchers including Hijazeen (2017), Davydenko (2011), Wanzenried (2011), Naceur (2008), Athanasoglo (2006), and Bourke (1988) found cost to income ratio to be positively impacting bank profitability in a significant way.

On the liquidity front, conflicting results are obtained. Jigeer (2023) finds no significant impact of liquidity on profitability of banks, just as Kusa (2013); while Davydenko (2011) finds liquidity to be negatively impacting bank profitability performance. Ranajee (2018), Yilmaz (2014), Karim (2013), Sufian (2012), Wanzenried (2011), and Bourke (1988) all find liquidity to be enhancing the profitability of banks.

Studies further highlight the impact that type of ownership (whether state owned or private owned and whether foreign or local) has on bank profitability. Again, mixed results are obtained with respect to ownership structure. Hijazeen (2017), Yilmaz (2014), Kusa (2013), and Athanasoglo (2006) find that ownership type has no significance, while Davydenko (2011) and Aysan (2007) find that foreign ownership impacts profitability positively. Wanzenried (2011) finds that state ownership contributed positively to bank profitability in Switzerland especially after the 2007-2008 financial crisis as government backing was seen as a key factor in the stability of a banking institution. Flamini (2009) on the other hand finds private ownership to impact bank

profitability positively.

2.2 Industry factors

Banking industry factors are seen to be important in determining bank profitability. Prominent among them are the level of competition and concentration as well as regulation. Jigeer (2023) finds that bank regulation contributes positively to bank profitability while Hijazeen (2018) and Shuremo (2016) find negative impact.

IMF (2022), Shuremo (2016), Kamarandin (2012), and Maimbo (2002) found that competition negatively impacted bank profitability as players fight for market share. In similar vein, Simpasa (2013) finds that monopolistic conditions contribute positively to bank profitability in Zambia. Abdullah (2014), Haaf (2002), and Bourke (1988) found positive impact of competition on bank profitability, while Athanasoglo (2006) found no impact. The mandate of the banks also served as an important contributor as some banks had a mandate to attain a particular objective other than profit maximization. This was the finding by IMF (2022) for some banks in Germany where there is a complex tiered industry structure with barriers to entry and an explicit mandate of a large part of the banking system, particularly cooperative and savings banks, to maximize the welfare of stakeholders rather than profits.

Regarding bank income diversification, many studies have found a positive correlation with profitability; for example, in developed countries (Elsas et al., 2010; DeYoung & Rice, 2004; DeYoung & Roland, 2001), emerging economies (Meslier et al., 2013; Sanya & Wolfe, 2011), and developing countries (Ammar & Boughrara, 2019; Hamdi et al., 2017). However, some studies found no rosy relationship between non-interest income diversification and profitability (Paltrinieri et al., 2020; Lee et al., 2014). In the Zambian context, Kayombo (2021) showed that certain banks in the country were unable to improve their profits by diversifying their sources of income, while others experienced better profit performance in certain years but not consistently. Nonetheless, his main conclusion was that diversifying non-interest income positively impacts the profitability of commercial banks in Zambia.

2.3 Macroeconomic variables

Macroeconomic factors are deemed important determinants of profitability of banks as they provide the operating environment. Studies by Jigeer (2023), Kamarudin (2012) and Sufian (2012), find inflation deleterious to bank profitability just as Maimbo (2002). On the other hand, Ranajee (2018) finds inflation to be positively impacting profitability performance when measured by ROE but not when using ROA for which there is a negative impact. Hijazeen (2017), Naceur (2008), and Athanasoglo (2006) all find inflation to have no impact. Karim (2013), on the other hand, finds inflation to be positively impacting bank profitability.

Based on economic theory, positive economic growth is expected to have a positive impact on bank profitability. Empirical evidence provides mixed results. Jigeer (2023) found a positive correlation with Gross Domestic Product (GDP) growth impacting bank profitability positively. So did Shuremo (2016), Karim (2013), Kusi (2013), Sufian (2012), Kamarudin (2012) and Flamini (2009). Yilmaz (2014), Naceur (2008), and Athanasoglou (2006) found GDP growth to have no impact, while Ranajee (2018) found GDP growth to be negatively impacting bank profitability.

Other studies have investigated other macroeconomic factors such as interest rates, exchange rates and level of stock market development to estimate their impact on bank profitability. Kohlscheen (2018), Shuremo (2016), Naceur (2008), Maimbo (2002), and Bourke (1988) all found interest rates to positively impact bank profitability.

Shuremo (2016) finds foreign exchange rate depreciation contributing positively to bank profitability while Naceur (2008) finds no impact. Naceur (2008) also finds the level of stock market development to be positively impacting bank profitability owing to the complementarities that come with it. Kohlscheen (2018) also introduces sovereign risk premia noting that increases in sovereign risk premia reduce bank profits in a significant way.

Arising from the literature survey, other important nexus is the impact of business cycles versus financial cycles, short term versus long term interest rates, credit growth versus GDP growth and private investment versus private consumption expenditure.

Clearly, based on literature review, this study finds that there is a myriad of determinants of commercial bank profitability. However, there is no evidence of a study of the impact of such factors for the profitability of the Zambian commercial banking sector. It was expected, therefore, that the current study would be an illuminating inquiry into the factors impacting profitability of commercial banks in Zambia.

3. Data and Methodology

A description of the data and data sources used in the study is provided in this section. The measures adopted to measure bank profitability and the variables that affect it in the context of this study are also defined. Lastly, the empirical model used in the study is described.

3.1 Data and Sources

The study obtained financial data from the Bank of Zambia (BoZ), which serves as the central bank of the country. The data consisted of audited financial statements covering the period from 2010 to 2021 for each commercial bank. These financial records allowed us to compute the profitability metric, Return on Average Assets (ROAA), as the dependent variable. We also considered several independent variables, including asset size, cost to income ratio, loan loss provisioning, liquidity, non-interest income, and income from foreign exchange activities.

The Bank of Zambia provided data for all 18 commercial banks operating in the country. However, due to bank mergers and acquisitions, we were able to analyze data for 15 banks only. This sample of 15 banks represents approximately 83% of the total population of banks in Zambia, which we deemed sufficient to be representative of the banking sector's characteristics.

3.2 Data analysis

Descriptive statistics were generated to appreciate the data used in the study. Variance inflation factor (VIF) and correlation analyses were then used to test the presence or absence of multicollinearity among the predictor variables.

The data used in this study had both time-series and cross-sectional elements. Such data allows for the use of panel data analysis methodology. The advantage of panel data analysis methodology is that it not only enables the researcher to incorporate cross-sectional observations over multiple time periods, but also to control for individual heterogeneity due to hidden factors. The researcher therefore avoids biased results.

Fixed effects (panel) regression by way of the Least Squares Dummy Variable approach in SPSS was used to analyse the panel data because of its ability to handle unbalanced and correlated data (SPSS Inc., 2005). The data set used in the study had missing data for a few banks for the years 2020 and 2021, hence the choice of the fixed effect model over General Linear Models (GLM). The fixed effects model was preferred because it is asymptotically efficient, whether the data is balanced or not. Additionally, Yeboah and Yeboah (2014) who carried out a similar study established that fixed effects regression analysis provided better results compared to ordinary least squares modelling. The dummy variables in the model were designed to control for all possible between-case/bank differences on any measured and unmeasured predictors. Accordingly, the fixed effect regression model takes the form:

$$yij = \alpha 0 + \beta 1x1ij + \beta 2x2ij \ldots \beta nxnij + \varepsilon ij \quad (1)$$

In the model above, yij represents the value of the dependent variable for a specific case ij. α0 denotes the constant term, while β1 to βn represent the coefficients of the fixed effect variables (predictors). The variables x1ij through xnij correspond to the fixed effect variables for observation j in group i, and εij represents the error term for case j in group i.

The specific model employed in the study is listed below, while the variables are defined in Table 1 below.

$$ROAAij = \alpha 0 + \beta 1SIZEij + \beta 2CERij + \beta 3LLPRij + \beta 4LIQR\ ij + \beta 5DIVij + \beta 6MKTRij + \beta 7GDPij + \beta 8INTij + \beta 9INFij + \varepsilon ij \quad (2)$$

Table 1: Variables definitions

Variable	Type	Definition	Expected predictor and outcome variable relationship
Profitability	Dependent	Return on Average Assets (ROAA). We use the sum of net income for current year and previous year divided by 2.	Profitability is the predicted variable.
Asset size	Independent	The natural log of the total asset size (SIZE). Total asset size aptly measures the size of each bank relative to other banks financed by both debt and equity.	Positive correlation on account of the anticipated economies of scale that come with bigger bank assets size.
Cost Efficiency Ratio	Independent	Ratio of the non-interest expenses to total income and denote it as CER.	Negative correlation indicating that the lower the cost to income ratio, the higher the profitability of the bank.
Loan Loss Provision Ratio	Independent	Ratio of the loan loss provision to the gross loans and advances as a measure of the quality of assets (LLPR).	Negative correlation implying that the lower the ratio, the better the quality of the loan book, the lower the losses and the higher the bank profitability.

Variable	Type	Definition	Expected predictor and outcome variable relationship
Liquidity ratio	Independent	Ratio of liquid assets to deposits and short-term liabilities (LIQR).	Negative correlation as a higher liquidity ratio is a trade off with employing funds for profitability.
Diversification	Independent	Ratio of non-interest income to total income as a proxy measure for diversification (DIV).	Positive correlation as greater diversification signifies more resilience to market turbulences and stability of income.
Foreign Exchange Income Ratio	Independent	Ratio of foreign exchange income to total operating income as a measure of the impact of market risk on bank profitability (MKTR).	We expect a positive or negative relationship between foreign exchange income and bank profitability depending on the net foreign currency position of the banks.
GDP growth	Independent	Annual GDP growth rate (GDP) as a measure of growth in national output.	Positive correlation as more GDP growth entails increases in economic activity and credit demand as well as in income and discretionary expenditure.
Interest rates	Independent	Average 91 Day treasury bill rate (INT) as a proxy for interest rates in the market.	Positive correlation as higher interest rates denote higher interest incomes for banks and therefore higher profitability. It could also be negatively correlated to profitability as increases in interest rates could lead to reduced bank credit.
Inflation rate	Independent	Annual inflation rate (INF) as a measure of increase in the general price level.	Positive or negative. Positive correlation as increase in inflation leads to increase in bank lending rates and subsequently more profitability. It could also be negative as higher inflation acts as a disincentive for lenders to lend hence reducing credit and ultimately profitability.

4. Empirical Results

4.1 Descriptive Statistics

Table 2 below shows the descriptive statistics for variables used in the model.

Table 2: Descriptive Statistics

Description	Minimum	Maximum	Mean
ROAA	-.19	.08	.0097
SIZE	12.00	17.00	14.6686
CER	.24	2.45	.5972
LLPR	.00	.43	.0679
LIQR	.19	3.12	.7820
DIV	.08	.57	.3154
MKTR	-.36	.42	.1369
GDP	-2.80	10.30	4.2250
INT	7.17	20.50	12.1200
INF	6.60	22.00	10.6333

The return on average assets (ROAA), which is our dependent variable has a mean value of 0.0097. On average, the banking sector earned a return of less than 1 percent at 0.97 percent on each unit of asset employed. In percentage terms, this rate of return on assets implies an inefficient use of assets for the banking industry as it was earning a very low rate of return on every unit of an asset employed in the banking business. However, this average return is as expected and is supported by the World Bank which reported that the aggregate return on assets for Zambia's banking sector ranged from 0.8% to 3.1% between 2012 and 2021 (World Bank Group, 2023).

The cost efficiency ratio (CER) shows the amount of costs incurred per unit of income earned. On average, this ratio was 0.5972. This means that for every unit of income earned, the banking industry spent 59.72 percent of that income on expenses. The ratio was marginally below the 60 percent maximum prudential threshold (Ministry of Finance and National Planning, 2022).

The loss loan provision ratio (LLPR) measures the level of provisions for loan losses set aside for every unit of loan disbursed. On average, the banking industry made a provision for loan losses of 0.0679 on every loan disbursed. This means that for every loan disbursed, 6.79 percent of it was expected to be irrecoverable. This was within the range considered reasonable since it is below the 10 percent prudential threshold (Ministry of Finance and National Planning, 2022) and internationally acceptable limit for the non-performing loans ratio in furtherance of the Basle Committee on Banking Supervision (BCBS) core principles guidance (Bank for International Settlements, 2012).

The liquidity ratio (LIQR) had a mean value of 0.7820. Effectively, the banking industry had on average 78.20 percent of every unit of a deposit and short-term liability covered by liquid assets. To note is that the liquidity ratio was above the prudential minimum of 25 percent (Ministry of Finance and National Planning, 2022) but below the minimum of 100 percent liquidity coverage ratio (LCR) set by the BCBS (Bank for International Settlements, 2013).

We measured the level of diversification of the banking sector in Zambia (DIV) using the ratio of non-interest income to total income. The mean of the non-interest income ratio was 0.3154. This means that out of the total income of the banking sector, on average, 31.54 percent was earned from activities other than the traditional credit provision function. This shows that even though the banking industry earned much (68.46 percent) of its income from the conventional core function of credit provision, the non-core activities were a huge contributor to the earnings of the banking sector in Zambia.

The mean for the market risk ratio (MKTR) was 0.1369. In this study, market risk is measured by the ratio of foreign exchange income to total income. Out of total income of the banking sector, on average, 13.69 percent was realized from activities in the foreign exchange market. Clearly, foreign exchange earnings are a significant part of bank earnings performance.

We also incorporated macroeconomic variables in the study namely annual GDP growth rate, average annual interest rate, and the average annual inflation rate. Annual GDP growth rate averaged 4.23 percent, the annual interest rate averaged 12.12 percent, while annual inflation rate averaged 10.63 percent, which was above the 6-8 annual inflation percentage range set as the country's macroeconomic inflation target range by the Government of the Republic of Zambia. (Ministry of Finance and National Planning, 2022)

4.2 Correlation Analysis

Table 3 below is a graphical representation of the correlation of the variables under study as measured by the Pearson correlation measure.

Table 3: Correlation Analysis

Correlations										
	ROAA	SIZE	CER	LLPR	LIQR	DIV	MKTR	GDP	INT	INF
ROAA	1									
SIZE	.433**	1								
CER	-.898**	-.458**	1							
LLPR	-.246**	.029	.132	1						
LIQR	.158*	.291**	-.158*	-.041	1					
DIV	-.259**	-.142	.383**	-.037	-.132	1				
MKTR	.125	.021	-.077	-.146	-.086	.357**	1			
GDP	-.188*	-.430**	.320**	-.162*	-.167*	.430**	-.011	1		
INT	.093	.276**	-.229**	.146	.115	-.292**	.033	-.545**	1	
INF	.172*	.282**	-.198**	.082	-.037	-.223**	.085	-.338**	.326**	1

Notable of the correlations among the variables is the high negative correlation between the average annual GDP growth and the average annual interest rate at -0.545. This implies that as interest rates rise, GDP growth declines. This agrees with economic theory, which postulates a negative correlation between GDP growth and interest rates. In similar vein, there is a negative correlation between GDP growth and inflation. This implies that as inflation goes up, GDP growth declines. This also agrees with economic theory that postulates that an elevated level of inflation has a deleterious impact on GDP growth hence, the desire by the country's monetary authority to keep annual inflation rate at single digit level of 6-8 percent.

The correlation between bank size and cost efficiency ratio is negative. This implies that as bank size increases, the cost efficiency ratio declines. This could indicate the positive role that asset size plays in enhancing efficiency gains on account of increased scale and scope. Bigger banks are likely to have increased cost efficiency as they spread the total cost base over larger scale of activities and over a larger pool of customers.

There was positive correlation between foreign exchange income ratio (MKTR) and non-interest income ratio (DIV) at 0.357 which is not surprising. This denotes that for the banking sector, there is a strong positive correlation between non-interest income as a whole and income from foreign exchange activities.

GDP growth rate is positively correlated with the level of diversification. This implies that as GDP growth rises, banks increase non-interest income which is an indicator of increase in non-core income from increased economic activity.

4.3 Analysis of Multicollinearity

We used the Variance Inflation Factor (VIF) to measure the level of severity of multicollinearity in the data. Table 5 below indicates the results of the analysis. All the VIF factor values were below the generally accepted threshold of 10. Similarly, the tolerance values were all above 0.1. According to Pallant (2020, pp.246-247) this indicates that there was no multicollinearity among the variables in the model which is a good prerequisite for robust regression results.

4.4 Goodness of Fit of the Model

To measure the goodness of fit of the model, we computed the Model Summary statistics shown in Table 4 below.

Table 4: Model Summary

Model	R	R Square	R Square Change
1	.586[a]	.343	.343
2	.949[b]	.900	.557

The R squared at 90 percent shows a high degree of goodness of fit of the model. This indicates that 90 percent of the variations in the dependent variable are explained by the predictors in the model with the other 10 percent attributable to other factors. According to Newbold (1974), this indicates that this model does fit the data well.

4.5 Regression Analysis

Table 5 below provides the regression results at 95 percent confidence level.

Table 5: Results of the Regression Analysis and Collinearity Statistics

Model		Unstandardized Coefficients		Sig.	Collinearity Statistics	
		B			Tolerance	VIF
1	(Constant)	.027		.553		
	SIZE	.003		.329	.106	9.432
	CER	-.114		.000**	.422	2.372
	LLPR	-.051		.025**	.551	1.816
	LIQR	-.001		.615	.632	1.583
	DIV	.018		.403	.361	2.767
	MKTR	.027		.163	.432	2.316
	GDP	.001		.069	.334	2.990
	INT	.000		.492	.195	5.127
	INF	.000		.730	.318	3.145

*** denotes statistically significant*

The results indicate that all the studied predictors have no statistical significance in impacting the profitability of commercial banks in Zambia except two, namely, the cost efficiency ratio (CER) and the loan loss provision ratio (LLPR).

Bank asset size has a positive impact on profitability albeit minimally. Based on the results of the study, a 1 percent increase in bank asset size has a corresponding 0.3 percent increase in bank profitability. This relationship is statistically insignificant with a computed 0.329 test statistic. Plausible explanation is that a bigger asset base enables a bank to take advantage of the larger scope and scale to realise economies of scale and scope and make profit gains. This finding is congruent with the finding by Elshady (2018), Tilahun (2017),

Karim (2013), Kusa (2013), Kusi (2017), Kamarudin (2012), Davydenko (2011), and Flamini (2009). All these studies found that bank assets size positively impacts bank profitability.

The cost efficiency ratio has a negative impact on bank profitability. This is as expected. As the cost to income ratio rises, it negatively impacts bank profitability. For every unit of cost increase, bank profitability decreases by 11.4 percent. Unsurprisingly, the result is statistically significant with a test statistic of 0.00. The finding of this study is similar to the findings by Hijazeen (2017), Davydenko (2011), Wanzenried (2011), Athanasoglo (2006), and Bourke (1988) who found that an increase in cost efficiency impacted bank profitability positively. This is obvious as costs are an expense and therefore impact negatively on bank earnings.

The loan loss provision was found to have a negative impact on profitability. The higher the LLPR, the lower the bank profitability. The plausible explanation for this phenomenon is that higher loan loss provisions are a signal of impending poor earnings performance. For every unit increase in LLPR, there is a corresponding 5.1 percent decrease in bank profitability. This result is statistically significant with a test statistic of 0.025. The finding of this study is similar to those of other researchers (Engel, 1996; Ryan, 1995; Waylen, 1994). These studies found that the loan loss provision was a signal to the impending poor earnings performance of a bank. The higher the LLP, the lower the profitability of the bank.

This study found bank liquidity to have a statistically insignificant negative relationship with bank profitability. The computed test statistic was 0.615. For every unit increase in bank liquidity, there is a corresponding 0.1 percent decrease in bank profitability. This signifies the tradeoff between bank profitability and liquidity. As banks hold more liquid assets to meet deposit withdrawals, they lose out on potential earnings from investing those funds in loans and advances. This finding agrees with the finding by other researchers (Khati, 2020; Davydenko, 2011; Kunt, 2001).

Income diversification (DIV) measured by the ratio of non-interest income to total income is another variable with a statistically insignificant positive relationship with bank profitability. For every unit increase in non-interest income, there is a corresponding 1.8 percent increase in bank profitability. Increases in non-interest income correspond with increases in bank profitability. Elsas et al. (2010), DeYoung & Rice (2004), and DeYoung and Roland (2001) found a similar relationship between non-interest income and bank profitability for developed economies. For emerging economies, Meslier et al. (2013), and Sanya and Wolfe (2011) also found the same relationship just as for developing countries (Ammar and Boughrara, 2019; Hamdi et al., (2017).

Exposure to market risk measured by income from foreign exchange transactions shows a positive relationship between bank profitability and market risk. This relationship is found to be statistically insignificant with a computed test statistic of 0.163. Every unit increase in income from foreign exchange transactions has a corresponding 2.7 percent increase in bank profitability. Shuremo (2016) found a similar relationship between bank profitability and foreign exchange risk exposure.

All the macroeconomic variables studied namely GDP growth, Inflation and interest rates have no statistical significance and their impact on bank profitability was found to be negligible or nonexistent. GDP growth had a positive statistically insignificant impact on bank profitability to the extent of 0.1 percent increase in bank profitability per unit increase in GDP growth. Inflation and interest rates had no impact whatsoever. This could imply that as revenues increased on account of increased interest rates and inflation, so did the costs associated with the banking business in tandem with the increase in inflation and interest rates hence having no impact on bank profitability. The findings of this study of the impact of macroeconomic variables on bank profitability are not unique.

As noted above, Yilmaz (2014), Naceur (2008), and Athanasoglou (2006) found GDP growth to have no impact, while Ranajee (2018) found GDP growth to be negatively impacting bank profitability. As for inflation, Hijazeen (2017), Naceur (2008), and Athanasoglo (2006) found inflation to have no impact on bank profitability.

Interestingly, the finding of this study on interest rates is at variance with findings from some prior studies. Kohlscheen (2018), Shuremo (2016), Naceur (2008), Maimbo (2002), and Bourke (1988) all found interest rates to positively impact bank profitability. Their explanation for this finding is that increases in interest rates lead to a widening interest rate spread, and hence, improved bank profitability.

5.0 Conclusion and Policy Implications

The aim of this study was to evaluate the factors that impact the profitability of commercial banks in Zambia. Using cross-sectional panel bank performance data for the period 2010 to 2021, we found that the following factors impact bank profitability measured by the return on average assets (ROA):

Asset size: Larger banks tend to be more profitable than smaller banks. This is likely due to economies of scale and the ability to attract more deposits and lend out more money.

Loan loss provisions: Banks that set aside more money to cover potential loan losses are likely to experience unexpected losses, which can negatively impact profitability.

Cost efficiency: Banks that can operate efficiently, with low costs, tend to be more profitable. This can be achieved through a variety of measures, such as streamlining operations, using technology effectively, and

negotiating favorable contracts with suppliers.

Liquidity: Banks that have a high level of liquidity tend to be less profitable. This is on account of the tradeoff between holding funds to meet customer withdrawal demands and deploying the liquid funds into income generating assets. Holding liquidity therefore tends to injure profitability.

Income diversification: Banks that have a diversified source of income are less likely to be affected by fluctuations in any one market. This can help to stabilize profitability.

Foreign currency activities: Banks that engage in foreign currency activities, such as foreign exchange trading and lending, can potentially earn higher profits. However, this can also be a risky proposition, as foreign exchange markets can be volatile.

Of these factors, only two have statistical significance: the cost to income ratio and the loan loss provision ratio. This means that these two factors are the most important determinants of bank profitability in Zambia.

We also found that macroeconomic variables such as GDP growth, inflation, and interest rates have no significant impact on bank profitability. This suggests that the profitability of commercial banks in Zambia is primarily driven by factors internal to the banks, such as their asset size, cost efficiency, and risk management practices.

These findings have important implications for policy for both commercial bank management and the regulatory authority of the banking sector in Zambia. For commercial banks, the findings suggest that they should focus on improving their cost efficiency and asset quality in order to boost profitability. The regulatory authority, on the other hand, should focus on ensuring that banks have adequate capital and liquidity buffers to withstand shocks from the macroeconomic environment.

Overall, this study provides valuable insights into the factors that impact the profitability of commercial banks in Zambia. The findings can be used by commercial banks, regulators, and other stakeholders to develop policies and strategies that promote financial stability and economic growth.

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