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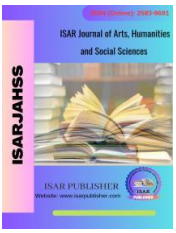

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Analysis of Credit Loss Provisions According to Micro and Macro Variables: Turkish Deposit Banks

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Abstract: Banks bring together those with surplus funds and those in need of funds within the financial system, thereby fulfilling their core functions with the right place, timing, and terms. Banks reintroduce the collected deposits to the system through granted loans while also allocating specific proportions of loan loss provisions to protect themselves from the undertaken risks. Therefore, they take precautions against possible credit losses by reflecting the value losses that may be faced in their financial statements in advance. Given the significance of financial institutions within the economic framework, this 'caution' holds paramount importance in ensuring the stability of both the sector and the broader economy.This study aims to reveal the relationship of the determined micro and macro variables on the loan loss provisions (LLPMB) levels through factor analysis. For the analysis, data for the period 2018-2022 of the top 10 largest deposit banks operating in Turkey in terms of their asset sizes were used. The factor structure of the factor analysis was first determined. The independent variables were observed to combine into 4 factors in a very strong structure. The impact of these factors on loan loss provisions (LLPMB) levels was then associated with an established model. The values and assumptions of all analyses were found to be quite strong and sufficient. It can be concluded from the results of this study that the variables generally had individual effects on LLPMB levels. In addition, these parameters were observed to have a combined effect by creating a high level of consistency, except for the macro data. The impact at the individual level is important. However, in the real market, where there are many measurable or unmeasurable parameters, revealing the combined effect of such variables may enhance the effectiveness of the predictions.

Keywords: Loan Loss Provisions, Banking Sector, Income-Expense Structure, GDP, Factor Analysis.

Subject classification codes: G01, G21, G29

1. INTRODUCTION

The activities of the banking sector are an extremely important factor in the development of country economies, which constitutes the focus of interest in the sector. Banks actively promote future growth by identifying and financing investments considered productive. A critical link between the effectiveness of the intermediary function of the banking sector and economic growth has been recognized. In this context, it can be deduced that the banking industry exerts substantial influence on the expansion and advancement of emerging economies. What is important here is that an efficient banking system will provide much greater benefits to the real economy. Therefore, the profitability of comes to the forefront. As part of the intermediary function, the primary activities of banks involve collecting savings and reintroducing them to the system by providing loans. It is also required by the principle of prudence to be cautious about the risks they may face while carrying out these activities. Prudence, one of the basic concepts of accounting, means for the institutions to act cautiously on the decision-making process in cases of uncertainty, not to overstate their assets and incomes, and not to understate their debts and expenses in their financial statements. As a part of the economic cycle and per the principle of prudence, banks are obliged to set aside provisions in order to cover the losses that have arisen or are expected to arise from their loans and other receivables with unknown amounts within the scope of the regulations of the supervisory authorities. Banks are institutions that have an influence on the supply of loans to the economy. The allocation of provisions by banks is a factor that significantly contributes to the volatility in profitability and changes in capital. Banks' loan loss provisioning policies are critical in assessing the stability of the financial system. As banks foresee potential loan losses during economic downturns, they need to set aside reserves for such losses during periods of economic expansion. Banks always focus on financial crises that may occur in unexpected or predictable periods. Thus, when the expected loan losses become certain, banks can cover the losses without damaging their capital by using the allocated loan loss provisions, and can smoothly maintain their function in expanding the loan supply to the economy. It is thusly ensured for banks to maintain their safe and

sound structure and continue to provide loans within their sector of operation.

Setting aside a specific portion of capital in exchange for the risks assumed by banks guarantees robust and secure financial frameworks within banks. There may arise a question to answer here. For profitable banks, can loan loss provisions harm their profitability? The capital of a bank offers direct assurance against the risks undertaken due to its assets. Therefore, banks may rather choose to transfer these profits to their capital and increase their capital instead of distributing their profits. Another option is to keep their profits as reserve funds. In both cases, investment capacity and loan placement limits will decrease due to the capital limitations of banks. As a result, banks will not be able to provide loans to increase their profitability, and the provisions set aside for loans will reduce the bank's profitability. On the other hand, if banks have chosen to distribute their profits, they can deduct the allocated provision amounts from the distributed profits. The amount of the distributed profit will thusly decrease, thereby ensuring a positive contribution to the financial structure of the bank. This can be considered as a positive effect of loan provisions.

From another perspective, non-performing loans disrupt the balance sheet asset-liability balance, causing bank liquidity ratios to be negatively affected. With the increase in the amount allocated to loan loss provisions, bank profitability will be negatively affected as well. This situation affects the financial sector and the real sector. This causes loan costs to increase and banks to become reluctant to meet the loan demands of the real sector. Companies with financial difficulties in the production sector may face negative scenarios such as layoffs in order to reduce their costs by reducing production. As a result, a negative impact on the overall economy can be observed.

Since the banking sector will earn less profit by increasing non-performing loans with the impact of negative economic developments, banks will transfer fewer resources to the budget, therefore leading to a negative impact on the budget. In this context, the subject of this study is the analysis of the relationships of loan loss provisions according to micro and macro variables from the perspective of the Turkish banking sector. Regarding loan provisions for the Turkish banking sector, loan provision calculation studies with a dynamic structure based on risk-oriented detailed examination and calculation have been initiated as of 2018. In this respect, the application TFRS 9 has become the key to accessing more realistic financial information. In the practice of provisioning by evaluating the loans and risks of loans in the sector, banks have reached more realistic figures with healthier calculations after 2018, and as a result of reflecting these healthier calculations in their financial statements, more accurate information can be obtained from their financial statements.

Due to the economic developments in Turkey in 2018 and the effects of the pandemic that started in 2019, banks were granted some flexibility regarding loan classifications and provisions. The period of analysis for this study was, therefore, determined as 2018-2022. The analysis data was obtained from the official website of the Banks Association of Turkey (TBB), the Banking Regulation and Supervision Agency (BDDK), and the Turkish Statistical Institute (TÜİK). The analysis included the top –in terms of asset sizes– 10 deposit banks operating in the Turkish banking sector. For this study, factor analysis is thought to be important in transforming different level variables and different bank data into standardized scores, and reflecting multiple correlations and the combined effect of more than one parameter into the model. In the study, the factor structure was first determined in factor analysis. The independent variables were observed to combine into 4 factors in a very strong structure. The effect of these factors on loan loss provisions (LLPMB) levels was then associated with our model. The values and assumptions of all analyses were found to be quite strong and sufficient. However, it is thought that these may strengthen with the increase in the number of data and periods.

2. Literature

In this section, previous research on loan loss provisions is examined.

Liu and Ryan (1995) – This study investigated the time schedules of loan portfolio composition and loan loss provisions of banks and examined the effect of the relationship between security returns and these provisions. The study argued that, compared to other information on loan default, the timeliness of loan loss provisions decreased with the increase in the discretion over such provisions, and that the discretion over loan loss provisions varied according to the type of loan. As a result, bank managers were determined to have greater discretion regarding loan loss provisions for large loans than for small loans. It was also stated that size and the possibility of renegotiation provide justification for banks to cover their losses on a loan basis rather than through statistical analysis of historical data.

Ahmed et al. (1999) – This research leverages the alteration in capital adequacy regulations in 1990 to conduct more robust examinations of the impact of capital and earnings management on bank loan loss provisions. The findings provided robust backing for the notion that loan loss provisions were employed for capital management purposes. Nevertheless, there was a lack of evidence indicating earnings manipulation through loan loss provisions. Moreover, in contrast to the signaling outcomes observed in earlier investigations, a negative correlation was identified between loan loss provisions and both future alterations in profitability and concurrent stock returns.

Laeven and Majnoni (2003) – This paper provided empirical evidence supporting the incorporation of loan loss provisions into capital regulations, thereby offering valuable insights to the ongoing discourse on this matter. Additionally, this study provided empirical evidence that many banks around the world delayed setting aside provisions for bad loans until economic downturns began, but by that time, it was too late; consequently, the impact of the economic cycle on banks' incomes and capital was heightened.

Anandarajana et al. (2007) – This research investigates the utilization of loan loss provisions (LLPs) by Australian banks for purposes of capital management, earnings management, and signaling. While some evidence suggested that Australian banks employ LLPs for capital management, there was no indication of a change in this practice following the implementation of the Basel Accord. The study concluded that Australian banks utilize LLPs to regulate their profits. Additionally, it was observed that listed commercial banks exhibit more aggressive earnings management behavior through LLPs compared to non-listed commercial banks,

with such behavior becoming more apparent in the post-Basel period.

Abou El Sood (2012) – This research, conducted on a sample of 878 US bank holding companies spanning from 2001 to 2009, uncovered compelling evidence of income smoothing practices. The study revealed that bank holding companies expedited their loan loss provisions to stabilize income levels when banks approached the legal minimum target, particularly during non-recessionary periods and times of heightened profitability. Moreover, it was observed that internally determined regulatory capital ratios held greater significance than those mandated by regulators in influencing income smoothing behaviors via loan loss provisions. A comparison between the pre-crisis period of 2002-2006 and the crisis era of 2007-2009 indicated that banks extensively employed loan loss provisions to artificially inflate income during the crisis.

Balboa et al. (2013) – This research contends that the relationship between accruals and earnings might not follow a linear pattern, as both the motivation to manipulate income and the methods to do so can vary based on the magnitude of earnings. Analyzing a dataset comprising 15,268 US banks spanning from 1996 to 2011, the primary findings of this study indicate that bank managers exhibit different earnings management strategies based on the size of earnings. Specifically, when earnings are negative, managers tend to employ strategies that decrease earnings ("big-bath"), whereas they utilize methods to increase earnings when earnings are positive. Additionally, when earnings are positive and substantial, managers resort to provisions as a means of smoothing income ("cookie-jar" accounting). These findings, which cannot be accounted for by the earnings-smoothing theory, align with the compensation theory.

Di Colli and Lopez (2014) – This study investigated the determinants of loan loss provisions and coverage ratios for the Italian banking system (2006-2012) using financial statements and balance sheets in the Italian Banking Association database. An analysis was also conducted for a subsample of cooperative credit banks. The research examined the factors influencing overall loan loss provisions (LLP) and endeavored to construct models to identify primary factors contributing to non-performing loans (NPLs) and the dynamics of NPLs. The study's findings suggested that Italian banks predominantly incurred loan loss provisions due to non-discretionary actions.

Caporale et al. (2015) – Utilizing data from a panel comprising over 400 Italian banks spanning from 2001 to 2012, this study analyzed the principal factors influencing loan loss provisions (LLP), categorized as either discretionary (including income smoothing, capital management, and signaling) or non-discretionary. The findings indicated that in Italian banks, LLP was primarily influenced by non-discretionary elements, particularly during the 2008-2012 economic downturn, aligning with the countercyclical pattern of LLP.

Acar and İpçi (2015) – This study investigated whether banks operating in Turkey used loan loss provisions to correct their income flows using panel data analysis with a sample of 28 commercial banks for the period 2005-2011. It was also tested whether loan loss provisions were used as a tool to communicate managers' expectations of future bank profits to investors. As a result, the study confirmed the signaling hypothesis that the income-smoothing behavior of foreign banks was much stronger than that of domestic banks and that bank managers used loan loss provisions to provide some specific information about the positive future expectations of their banks.

Curcioa and Hasan (2015) – This research investigated the correlation between loan loss provisions (LLP) and earnings manipulation concerning the capital adequacy of banks within the Euro Area (EA) and non-EA lending institutions. It also explored whether LLPs conveyed managers' anticipations regarding future bank earnings to investors. The study also traced the role of bank regulations and creditor protection systems in explaining income smoothing. Data spanning from 1996 to 2006 showed that loan loss provisions (LLPs) mirrored shifts in the anticipated caliber of a bank's loan assets for both categories of banks. Additionally, earnings manipulation emerged as a notable factor influencing LLPs among Euro Area (EA) intermediaries, whereas non-EA loan institutions employed LLPs for signaling purposes.

Ozili and Outa (2017) – This study examined the current academic and policy literature on bank loan loss provisions (LLP). It was observed that the interplay among loan loss provisions (LLPs) and the diverse precautionary, accounting, corporate, cultural, religious, tax, and financial frameworks across different countries, alongside managerial discretion in allotting provisions, strongly correlated with income smoothing, capital management, signaling, tax management, and other objectives. Furthermore, the research highlighted that addressing issues such as the ethical aspects of income smoothing, influential factors affecting income smoothing, methodological challenges in LLP modeling, and dynamic credit loss could offer diverse perspectives for future investigations.Soedarmonoa et al. (2017) – This study examined whether loan loss provisions were cyclical in Islamic banks, based on a sample of Islamic banks worldwide from 1997 to 2012. Empirical findings revealed that although the 'expected' loan loss model (E-LLM) was implemented for Islamic banks in various countries, loan loss provisions remained cyclical in Islamic banks. In conclusion, this study highlighted the possibility of reducing the cyclicality of loan loss provisions in Islamic banks with higher capitalization.

El Diri et al. (2021) – This research explored the conduct of earnings management (EM) in defunct banks by analyzing the degree and orientation of EM in the vicinity of FDIC-insured commercial bank bankruptcies. The empirical analysis found that failing banks were significantly more engaged in developing banks than non-failing banks. It was consequently observed that the discretion of failed banks on loan loss provisions varied between aggressive (upwardly developing) and conservative (downwardly developing).

Hou et al. (2021) – This study investigated the effect of bank executive salary limits on discretionary loan loss provisions (DLLP) in the context of a large developing economy such as China. A bank executive pay limit intended to temporarily suspend stock option incentive plans was found to lead to a significant increase in income-decreasing DLLPs, while a pay limit imposed to restrict total salaries was found to lead to a significant decrease in income-increasing DLLPs. Furthermore, it was noted that the degree of impact of salary limits on bank DLLPs varied according to the personal characteristics of CEOs and bank manager privileges.

Skała (2021) – This research examined the involvement of shareholders in the formulation of discretionary loan loss provisions (LLP) and their utilization in income smoothing. Drawing upon a dataset comprising over 200 Central European financial institutions, it was observed that the LLP practices and income smoothing behaviors differed among foreign-capitalized banks, state banks, and domestic private banks. The analysis revealed that foreign and state-owned banks tended to establish larger discretionary LLPs compared to domestic private banks. Additionally, it was identified that foreign banks utilized these LLPs for discretionary income adjustments, whereas state-owned banks generally refrained from income smoothing practices. Furthermore, the study noted that the level of discretionary LLPs in foreign banks correlated positively with low asset quality and high profitability. Conversely, foreign banks operating in volatile economic conditions with low profitability did not exhibit higher discretionary LLPs compared to domestic private banks.

Tayler and Zilberman (2021) – This research explored the impacts of optimal loan loss provisions on well-being using a New Keynesian framework incorporating internal default risk and inflationary credit spreads. The study highlighted the distinctive relationship between provisions, credit spreads, and inflation, suggesting their potential to bolster macroeconomic stability. It was found that the effectiveness of optimal provisions was most pronounced in addressing cost-push fiscal shocks associated with fluctuating spreads and the zero lower bound challenge in monetary policy. The requirements imposed on credit loss provisions after financial distress during an economic downturn were stated to override the value of the committed monetary policy. In contrast, deflationary demand shocks were indicated to guarantee an optimal increase in loan provisions, which would inflate prices while slightly contracting production.

Tran and Houston (2021) – This research examined whether the correlation between economic policy uncertainty and discretionary loan loss provisions varied based on the characteristics of bank holding companies (BHCs), utilizing a dataset comprising 2483 US bank holding companies. The study indicated that the presence of institutional investors, heightened analyst coverage, and the issuance of dividends mitigated the positive link between discretionary loan loss provisions and policy uncertainty. Additionally, it was observed that increased regulatory oversight weakened this correlation. As a result, it was inferred that policy uncertainty acted as a safeguard against managerial misjudgments in adjusting loan loss provisions, albeit with a reduced inclination from managers when both internal and external stakeholders were well-informed.

Kutubi et al. (2021) – This study examines whether managers with multiple management roles affected the size of loan loss provisions of banks in South Asia. As a result, it was found that managers with multiple management roles tended to delay the recognition of loan loss provisions. This study specifically detected a U-shaped relationship between managers with more than one management role and loan loss provisions. This indicated a more prominent delay in the case of moderately busy managers than managers who have fewer management roles and are limited in time.

Degryse and Huylebroek (2023) – This research investigated how government financial assistance during the COVID-19 pandemic affected banks' loan loss provisions. The study distinguished between direct support and liquidity support to analyze the effects of different forms of assistance on banks' provisions for loan losses. Direct support encompassed cash transfers, tax cuts, and tax deferrals, while liquidity support included state-backed loans and capital injections. The findings revealed that direct support decreased banks' credit portfolio risk, whereas liquidity support did not have the same effect. Moreover, the impact extended beyond macroeconomic stabilization, indicating that direct support directly contributed to reducing banks' loan portfolio risk amid the pandemic.

3. Methodology and Data

The factor analysis method used in the analysis will be explained in this section of the study. In the next section, the data set used in the study is provided.

3.1. Factor Analysis

Factor analysis encompasses various correlational analyses aimed at exploring the connections among variables. Daniel (1988) succinctly described factor analysis as a method to investigate the covariance structure of a group of variables and elucidate the relationships among them using a smaller set of unobserved latent variables known as factors. Reymont and Joreskog (1993) provided a comprehensive definition, stating that factor analysis refers to a range of techniques for examining interrelationships within a set of variables or objects, resulting in the identification of a few hypothetical variables (or objects) called factors. These factors are believed to encapsulate the essential information from the larger set of observed variables or objects, thereby reducing the data's overall complexity by leveraging inherent interdependencies. As a result, a small number of factors typically capture a similar amount of information as the much larger original set of observations (Stapleton, 1997).

The areas where factor analysis is applied can be grouped in three points: (1) to summarize the data by dividing it into homogeneous groups, to reveal new concepts under the name of 'factor', thus to get familiarized with the content of the study subject more closely and to facilitate interpretations; (2) to identify highly correlated variables and after selecting the most important among them, to include it in the regression models and to ignore the others, thereby avoiding the problem of multicorrelation, and (3) to reduce the number of data. The first factor revealed as a result of the factor analysis accounts for the largest part of the total variance among all variables included in the system, followed by the second, third, and other factors, respectively. As the number of factors increases, the total variance explained by each additional factor decreases. As a result, the whole system can be explained with 1-2 factors. (OMÜ, 2023)

3.2. Methodology

First, the factor structure of the factor analysis was determined. At this stage, different parameters emerged as similar factors and were named accordingly. In other words, the names of the combined subjects are also combined. The independent variables were combined into 4 factors in a very strong structure, and finally, the effect of these factors on loan loss provisions (LLPMB) levels was associated with our model. The factor analysis is important in transforming different level variables and different bank data into standardized scores and reflecting multiple correlations and the combined effect of more than one parameter into the model. The

values and assumptions of all analyses are quite strong and sufficient; however, it is thought that these may strengthen with the increase in the number of data and periods.

As to the analysis of data, descriptive statistics, frequency, and percentage values were calculated. Factor analysis was performed to determine the consistency of the factor structure of the variables. Aderson-Rubin factor scores for the identified factors were created. Regression analysis was conducted to model the multi-level effect of the 4 identified factors on LLPMB Loan Provisions/Total Assets. In the study, p-values less than 0.05 were considered significant. Analyses were conducted with the SPSS (Statistical Package for the Social Sciences) 25.0 package program.

4. Data

The relationship levels of loan loss provisions with micro and macro variables were investigated by factor analysis using the financial ratios of the top ten – based on their asset sizes – operating in the Turkish Banking sector for the period 2018-2022. Financial ratios and other variables used in the analysis have been retrieved from the official website of the Banks Association of Turkey (istatistik@tbb.org.tr), TCMB EVDS Bank Statistics (https://evds2.tcmb.gov.tr), and TÜİK Data Portal (https://data.tuik.gov.tr).

Table 1. Deposit Banks Data Subjected to Analysis

Deposit Banks
Türkiye Cumhuriyeti Ziraat Bankası A.Ş.
Türkiye Vakıflar Bankası T.A.O.
Türkiye İş Bankası A.Ş.
Türkiye Halk Bankası A.Ş.
Türkiye Garanti Bankası A.Ş.
Yapı ve Kredi Bankası A.Ş.
Akbank T.A.Ş.
QNB Finansbank A.Ş.
Denizbank A.Ş.
Türk Ekonomi Bankası A.Ş.

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Table 2. Macro and Micro Variables of the Analysis

Variables	**Explanation**	**Notation**
Dependent Variable	Loan Loss Provisions/Total Assets	LLPMB
Independent Variables (Micro)		
Income-Expense Structure	Net interest income/Total Assets	NFMMB
Balance Sheet Structure		
	TRC (Turkish Currency) Liabilities/Total Assets	CLMB1
	FC (Foreign Currency) Liabilities/Total Assets	CLMB2
	Total Deposits/Total Assets	CAMB
Profitability		
	Pretax Profit/Total assets	PPIMB
	Net profit/Total assets	ROAMB
	Net profit/Capital	ROEMB
Asset Quality		
	Total Loans/Total Assets	RYMB
	Non-performing loans/Total Loans	NPLMB
	Total Loans/Total Deposits	KMMB
Capital Adequacy		
Growth	Total Capital/Total Assets	EQUMB
Size	LOG Value of Total Assets	
Independent Variables (Macro)		
	Gross Domestic Product	GDP
	Inflation	INF

5. Analysis and Findings

Table 3. General Characteristics

		n	reactions to obtain
Banks	Akbank	5	10.0%
	Denizbank	5	10.0%
	Garanti B	5	10.0%
	Halkbank	5	10.0%
	İşbank	5	10.0%
	QNB Finans	5	10.0%
	Ziraat B	5	10.0%
	TEB	5	10.0%
	Vakıfbank	5	10.0%
	Yapı ve Kredi	5	10.0%
Year	2018	10	20.0%
	2019	10	20.0%
	2020	10	20.0%
	2021	10	20.0%
	2022	10	20.0%

Data from Akbank, Denizbank, Garanti, Halkbank, İşbank, QNB Finans, Ziraat B, TEB, Vakıfbank, and Yapı ve Kredi Bankası were included in the study based on the period 2018-2022.

Table 4. Factor Analysis Table

Parameters	Factor Analysis		
	Dimension Name	Factor Load	% Explained Variance
NFMMB	Income-Expense Structure and Balance Sheet Structure	0.647	36.19
CLMB1		0.965	
CLMB2		0.966	
CAMB		0.591	
PPIMB	Profitability	0.896	24.11
ROAMB		0.888	
ROEMB		0.770	
RYMB	Asset Quality-Capital Adequacy-Total Assets	0.689	21.43
NPLMB		0.775	
KMMB		0.853	
EQUMB		0.699	
SIZEMB		0.772	
GDP	Macro parameters	0.909	7.56
INF		0.853	

As a result of the factor analysis, the income-expense structure, profitability, asset quality, and macro indicators for estimating the LLPMB levels included in the study were determined to have collected under 4 sub-factors. These factors are named the factors Income-Expense and Balance Sheet Structure, Profitability, Asset Quality-Capital Adequacy-Total Assets, and Macro parameters. The sample adequacy coefficient (KMO) of the factor analysis was found to be 0.74. It indicates the sufficiency of the sample size (n=50) for revealing the factor structure. Additionally, the Bartlet test ($X2 = 1358.622$, $p = 0.01$, $p < 0.05$) was applied to examine the significance levels of the factor structures.

On examination of the structures, the Income-Expense and Balance Sheet Structure was determined to have a variance ratio of 36%, Profitability of 24%, Asset Quality-Capital Adequacy-Total Assets of 21%, and Macro parameters of 8%. In total, these variables were determined to have an explained variance of 89%. This high ratio indicates the high consistency of the detected structure. For the formation of the dimensions determined to be significant, the factor was converted into scores using the Aderson-Rubin method. Since these scores were normalized and linear data, they can be expressed to be suitable for Regression analysis.

Table 5. Factors affecting the LLPMB level

Dependent Variables	Independent Variables	Model Testing		Test of coefficients				
		Model F	R^2	β	t	p	Tolerance	VIF
LLPMB	Income-Expense Structure and Balance Sheet Structure	F=96.07	0.58	0.89	4.12	0.01	0.29	3.45
	Profitability			0.33	3.63	0.01	0.29	3.43
	Asset Quality-Capital Adequacy-Total Assets			0.02	2.52	0.01	0.40	2.52

*Regression analysis was performed. **DW=1.86

The LLPMB level was observed to be significantly related to the income-expense structure and balance sheet structure, profitability, and asset quality-capital adequacy-total asset factors. The Macro parameters factor, which was considered significant in the study, was observed not to affect the LLPMB levels significantly and at multiple levels. The model established in the study was calculated to be statistically significant ($F = 97.08$, $p = 0.01$, $p < 0.05$). The coefficient (β) used in the model was observed to be significant (t Profitability = 3.63, t Income-Expense Structure and Balance Sheet Structure = 4.12 t Income-Expense Structure and Balance Sheet Structure = 2.52, $p = 0.01$, $p < 0.05$).

It was observed that the explanation level of changes in LLPMB for the independent variables in the model, such as income-expense structure and balance sheet structure, profitability, and asset quality-capital adequacy-total asset factors, was 58%. Moreover, it was observed that the explanation level of the model was at a high level ($R2 = 0.58$). Although this ratio was high and the factors included in the study explained 58% of the changes in the LLPMB level, there was still a ratio of approximately 42% that was unmeasured.

As a result of the Durbin and Watson test, it was seen whether there was an autocorrelation in the model ($DW = 1.86$) and that the Tolerance and VIF values were within appropriate ranges. In this regard, the established model was observed to provide sufficient assumptions and was interpretable.

6. Conclusion

This study investigates the impact of micro and macro variables on loan loss provisions (LLPMB) levels using factor analysis. Data from the top 10 largest deposit banks in Turkey, covering the period 2018-2022, were analyzed. Results show that the income-expense structure and balance sheet structure are the most influential parameters affecting LLPMB levels, followed by factors related to profitability and asset quality-capital adequacy-total assets. Despite the significance of these individual variables, their combined effect contributes to a high level of consistency in LLPMB levels. However, macro parameters were found to have no significant impact on LLPMB levels. The study suggests that the COVID-19 crisis and government financial support to banks during this period may have affected loan loss provisions, warranting further investigation. Additionally, expanding the dataset and including more banks and indicators could strengthen future analyses. Overall, the study acknowledges its limitations but underscores the robustness of its findings, anticipating further reinforcement with increased data and analysis periods.

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Author statement
I also declare that I agree with the submission of the article to International Journal of Management and Accounting and I am responsible for its content and originality. This article has not been published or submitted for publication elsewhere.

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