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Stress test of the capital of the BPRS and the BUS for the period 2014-2022 using the ECL approach

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ABSTRACT

The operation of BUS and BPRS cannot be separated from the risks experienced, one of which is capital risk. The capital stress test used to calculate the capital adequacy of BUS and BPRS is the calculation of Expected Credit Loss (expected loan loss). ECL is the result of multiplying PD, LGD, and EAD. This study aims to determine the assessment and differences in capital stress tests using the ECL approach in BUS and BPRS. This research uses a descriptive quantitative approach. The method used is purposive sampling. The samples of this study were 12 BUS and 3 BPRS. The data used is secondary data in the form of annual financial reports taken from the official websites of BUS and BPRS for 2014-2022. The results of this study indicate that the assessment of the capital stress test using the ECL approach on BUS is classified as stage 1 (performing), and BPRS is classified as stage 2 (under-performing). A significant difference was found between BUS and BPRS.

INTRODUCTION

In general, a healthy bank is a bank that can maintain public trust by facilitating payment traffic and conducting various policies Wilara & Prawoto, (2016). Islamic banks are also institutions that do not use interest. They rely on the Qur'an and Hadith to implement their financial products Rosida & Yazid, (2022). In addition, some things become the main focus of bank supervisory authorities worldwide, namely the adequacy of bank capital. Banks must have enough capital to cover all business risks experienced by the bank Indroes, (2017). For banks, the capital aspect is essential because global competition for capital strength is needed to reduce the risks that will occur in the present and the future. The capital aspect can be seen from the bank's capital adequacy level Utami & Tasman Abel, (2020).

The minimum banking capital regulation prepared by the Financial Services Authority Regulation Number 11/PJOK.03/2016 states that the minimum banking capital adequacy is set at 8%-11% adjusted from risk-weighted assets (ATMR) at the level of risk profile faced. Meanwhile, the minimum capital adequacy that needs to be owned by BPRS is 8%, derived from risk-weighted assets (RWA) (PJOK, 2022). Islamic banking faces many risks in its activities; capital risk is one of the risks it faces in maintaining capital requirements and growth Febiyanni & Hermanto, (2023).

The capital development in 2014-2022 in Islamic commercial banks (BUS) is in good condition. Capital in 2014 amounted to 15.78% and continued to increase until 2022 by 26.28%, while the development of capital in 2014-2022 in Sharia People's Financing Bank (BPRS) At the end of 2014, BPRS capital amounted to 22.77% and in 2019 capital amounted to 17.99%. In 2020, BPRS capital increased by 28.60% compared to the previous year. The capital increase was partly driven by the POJK/No.03/2016 regulation regarding the minimum capital provision obligation of BPRS, but BPRS capital decreased again until the end of 2022 at 24.42%. A decrease in asset quality can cause a decline in BPRS capital due to bad debts and the inability of banks to meet the minimum capital requirements set by Bank Indonesia, which causes capital risk Pratiwi et al., (2019).

BPRS and BUS, in carrying out their operations, are also inseparable from the risks experienced, including capital risk. Poor capital risk mitigation can lead to potential bankruptcy Hartanto & Setijaningsih, (2023). Bankruptcy is the failure of a company or agency to carry out activities to achieve its goals; bankruptcy can occur over a very long period (Agustian & Syofyan, 2022). Sufitri's (2019) research explains that bankruptcy in BPRS and BUS can be caused by a lack of fulfilment of the mandatory 8% core capital set by the OJK and Bank Indonesia.

Capital Risk in BUS and BPRS is a risk arising from a decrease in asset quality due to bad credit, so banks need to create new shares, find new investors, and increase capital deposits by owners to improve capital conditions to be equivalent to the capital requirements in BUS and BPRS Prabowo, (2016). The risk of bank capital adequacy is the main focus of bank supervisory authorities worldwide Indroes, (2017). Therefore, BUS and BPRS need to conduct *stress tests.* It is a tool for analysing and identifying risks that may be benign but which, if left unchecked, could significantly impact banking. The *stress test* method can assess capital pressure on the Bank Yildrim (2012).

The *stress test* used to calculate the capital adequacy of BUS and BPRS is the calculation of *Expected Credit Loss* (ECL) (Hartanto & Setijaningsih, 2023). The ECL approach in banking is reserve planning due to bank losses in the face of existing risks due to a decrease in asset value due to the value of bad credit caused by customers (Kindi et al. et al., 2023).

Previous research by Auraluna et al. (2022), Mongid & Kurniadi (2018), Setiawan et al. (2022), Sugiarto & Suroso (2020) explains that the calculation of Expected Credit Loss is proven to have a significant contribution to the national interest, banking industry, and financial position statements and also has an impact on the PD of Islamic banks in Indonesia, where Islamic banks need to distribute financing and ensure PD below 9%. This difference from previous research is an additional research object, namely BPRS (Sharia People's Financing Bank), and the research

period was conducted from 2014 to 2022. This study aims to determine the assessment and differences in capital stress tests on BUS and BPRS using the expected credit loss (ECL) approach.

RESEARCH METHODS

This study uses a descriptive quantitative approach to determine an objective description of the condition using numbers, data collection, and interpretation of data Arikunto, (2006). The population of this study includes BUS and BPRS registered with OJK at the end of 2022. The sample of this study comprises BUS and BPRS, which publish annual financial reports. The sample of this study contained 12 BUS and 3 BPRS. The sample list is presented in Table 1.

Table 1. List of BUS and BPRS samples

No.	Islamic Commercial Bank	Islamic People's Financing Bank
1	Muamalat Bank	BPRS Bahkti Sumekar Perseroda
2	Bank Syariah Indonesia	BPRS HIK Bahari
3	Panin Bank Syariah	BPRS HIK Parahyangan
4	BCA Syariah	
5	Bank Victoria Syariah	
6	Bank Mega Syariah	
7	BTPN Syariah	
8	Bank Bukopin Syariah	
9	Bank Aladin / Maybank Syariah	
10	Bank Aceh Syariah	
11	BPD Kapri Syariah	
12	BPD NTB Syariah	

Source: OJK, 2024

This research uses a purposive sampling method so that the sample is selected based on specific criteria as follows:

1. BUS and BPRS run their operations and are registered with the OJK for 2014-2022.
2. BUS and BPRS publish their annual financial reports completely and sequentially during 2014-2022.

This study uses secondary data. The calculation method uses the Expected Credit Loss approach with the formula = PD x LGD x EAD; Expected Credit Loss (ECL) calculates the capital stress test with PD testing set as NPF. Banks' LGD is generally set at 40%, and EAD is the total financing provided to customers in the form of mudharabah, musyarokah, murabahah, sale and purchase, and other contracts data analysis techniques used in the research, including quantitative descriptive analysis using SPSS and Mrs. Excel tools and t-test using EViews 12 tools.

RESULTS AND DISCUSSION

RESULTS

Quantitative Descriptive Analysis

The sample used in this study consisted of 12 BUS and 3 BPRS. The quantitative descriptive analysis describes data based on mean, Standard deviation, minimum, and maximum. The following are the results:

Table 2. Results of descriptive statistical analysis of BUS and BPRS

Bank Type		Analysis Result
BUS	Mean	154.99614
	Std.Deviation	275.445548
	Minimum	.223
	Maximum	1.069.542
BPRS	Mean	4.24737
	Std.Deviation	4.288537
	Minimum	.004
	Maximum	12.355

Source: SPSS, 2024

The descriptive statistical test results show that the highest ECL is Maybank Syariah, and the lowest is BCA Syariah. Meanwhile, in BPRS, the highest ECL is BPRS Bhakti Sumekar, and the lowest is BPRS HIK Bahari. The following is also the table of the growth of expected credit loss of BUS for the period 2014-2024:

Table 3. ECL BUS growth in the period 2014-2022

BANK	ECL 9 -Year Growth								
	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bank Muamalat	835.882	684.343	224.056	454.168	346.401	501.341	467.158	5.773	64.744
Victoria Syariah	20.458	20.739	21.100	20.610	17.086	13.005	13.816	11.992	3.388
BSI	15.720	259.233	220.196	328.213	667.292	333.033	286.983	222.878	177.394
Mega syariah	39.499	53.233	52.994	51.055	39.916	36.239	27.304	28.089	25.729
BCAS	0.852	6.189	2.908	0.670	4.694	5.871	0.222	0.249	0.303
Bukopin Syariah	49.575	47.206	89.462	75.785	61.957	77.040	80.343	91.165	86.413

BTPN Syariah	8.696	2.501	3.997	2.421	5.821	9.359	7.611	7.511	15.590
Aceh Syariah	36.452	38.536	3.417	2.055	2.117	2.298	2.444	2.615	2.773
Panin dubai Syariah	5.494	43.616	65.159	166.717	169.456	98.953	86.688	82.182	79.097
BPRD Riau Kepri Syariah	9.998	17.105	7.240	5.596	17.963	19.314	76.602	66.474	25.873
BPD NTB Syariah	6.215	8.649	8.346	5.397	11.100	20.608	22.819	20.520	8.606
Maybank Syariah	629.305	1.069.54	1.055.511	796.263	800.096	941.404	808.483	1.042.130	1.009.149

Source: Mrs. Excel, 2024

Based on Table 3 above, it can be seen that the ECL growth of Islamic commercial banks for nine years. The ECL calculation of Victoria Syariah Bank, Mega Syariah Bank, Aceh Syariah Bank, and Muamalat Bank shows a yearly decrease. In contrast, BSI Bank, BCAS, BTPN Syariah, and BPD NTB Syariah show fluctuating growth. Maybank syariah, panin dubai syariah and BPRD Riau kepri show an increase in ECL every year. The following is also the table of the growth of expected credit loss of BPRS for the period 2014-2024:

Table 4. ECL BPRS growth in the period 2014-2022

BPRS	ECL 9 -Year Growth								
	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bhakti Sumekar	1.453	2.012	3.585	5.184	7.839	10.139	11.384	10.466	12.355
HIK Parangkaraya	1.816	2.682	2.926	4.451	4.894	5.381	6.732	11.287	10.663
HIK Bahari	4,12	5,28	15,09	45,15	84,78	331,66	131,07	259,65	324,07

Source: Mrs. Excel, 2024

Based on Table 4 above, the ECL growth of Islamic people's financing banks has occurred for nine years. The calculation of ECL BPRS Bhakti Sumekar, HIK parangkaraya, and HIK Bahari increases yearly, although the increase in BPRS HIK Bahari is smaller than that in the other 2 BPRS.

T-test

The t-test is a hypothesis test in research to verify the authenticity and error of a hypothesis or ensure the acceptance or rejection of a hypothesis that has been made. The following table 3. The results of the t-test.

Variable	t-Statistic	Prob.
BUS	2.570292	0.0165
BPRS	2.879949	0.0080

Source: Eviews 12 processed, 2024

Based on the table above, it can be seen that nil prob. BUS and BPRS> 0.05, so it can be concluded that ECL significantly influences BUS and BPRS.

DISCUSSION

The results of the capital *stress test* assessment using the ECL approach on BUS

Based on the results of the analysis regarding the capital stress test assessment using the Expected Credit Loss (ECL) approach on BUS in 2014-2022, The highest ECL of 1,069,542 in 2015 was Maybank Syariah; it can also be seen that Maybank Syariah showed a high ECL growth graph for nine years; it can be concluded that Maybank Syariah is in the ECL *stage* 3 (*non-performing*) category**.** Next, the lowest ECL of 0.222 in 2020 is BCA Syariah; it can be seen that BCAS has shown a low ECL growth graph for nine years; it can be concluded that BCAS is in the ECL *stage 1 (performing*) category Indramawan (2019)**.**

Bank Victoria Syariah, Bank Mega Syariah, and Bank Aceh Syariah for nine years show a decreasing (low) ECL growth graph; it can be concluded that the banks above are in the ECL *stage 1 (performing)* category, then Bank Muamalat, Bank Bukopin Syariah, Bank Panin Dubai Syariah, BPD Kepri Riau Syariah and BSI for nine years show a reasonably high ECL growth graph, but every year there is a decrease in ECL, it can be concluded that the banks above are in the ECL *stage 2 (under-performing)* category. Next are BPTN Syariah and BPD NTB Syariah, which show a fluctuating growth graph. However, the fluctuation is decreasing, and the ECL of these two banks is still relatively low, so it can be concluded that the banks above are in the ECL *stage 1 (performing)* category Indramawan, (2019)**.**

Suroso (2017) explanation of the stage placement in the Expected credit loss calculation is as follows:

1. Stage 1 (performing), ECL, where there is no increase in credit risk and financial assets. Such as loans that have never been paid late within one year (low ECL)

2. Stage 2 (underperforming), ECL with significantly increased credit and financial asset risks. For example, loans over 30 days late in payment must still be in the stage 3 category. ECL is expected to reach its final maturity date (lifetime).
3. Stage 3 (non-performing), ECL Loans and financial assets that are sharply impaired with a history of late payments ECL recognised until the final maturity time (lifetime). I am running a few minutes late; my previous meeting is over. ECL is high, and credit risk has a very significant increase.

In this study, it was found that most of the BUS samples were still classified as *stage 1 (performing)*, so it can be said that BUS was still able to maintain the health of its capital through controlling NPF (PD) and financing provided (EAD) so that the assessment of the capital *stress test* on BUS using the ECL (expected loss) approach is influenced by the level of increase and decrease in PD and EAD Mongid & Kurniadi, (2018).

The results of this study are supported by research conducted by Mongid and Kurniadi (2018), which explains that the stress test of Islamic banking capital in Indonesia with the ECL approach is closely related to the calculation of PD, LGD, and EAD.

Results of capital stress test assessment using the ECL approach at BPRS

Based on the capital stress test assessment analysis results using the Expected Credit Loss (ECL) approach at BPRS from 2014 to 2022, The lowest ECL of 0.004 in 2014 is BPRS HIK Bahari. It can also be seen that BPRS Bhakti Sumekar shows an ECL growth graph for 9, which shows a reasonably high ECL growth graph. Still, the ECL of BPRS HIK Bahari is relatively small, so it is in the ECL *stage 1 (performing)* category Indramawan, (2019)**.** *The* next highest ECL of 12,355 in 2022 is BPRS Bhakti Sumekar; it can also be seen that BPRS Bhakti Sumekar shows an ECL growth graph that increases every nine years, at BPRS HIK Parahyangan also shows an ECL growth graph that increases every nine years both BPRS Bhakti Sumekar and BPRS HIK Parahyangan show a high ECL growth graph. There is a significant increase, so it falls into the ECL *stage 2 (under-performing)* category Indramawan, (2019)**.**

In this study, it was found that there are 2 BPRS in stage 2 (under-performing); this is due to the increase in NPF (PD) and the level of financing provided (EAD) by BPRS, which is increasing every year. So, BPRS is quite capable of maintaining the health of its capital. So, the capital stress test assessment on BPRS using the ECL (expected loss) approach is influenced by the increase and decrease in PD and EAD Mongid & Kurniadi, (2018). The increase in financing provided by BPRS is supported by research conducted by Wenni and Canggih (2021), which states that in 2015-2019, BPRS could channel funds raised for financing activities to experience a significant increase.

Differences in capital *stress test* results using the ECL approach between BUS and BPRS

Based on the results of the analysis of capital risk measured using the capital *stress test* approach using the *Expected Credit Loss* (ECL) approach between BUS and BPRS in 2014-2022, answering the hypothesis in the research that there is a significant difference in ECL BUS and BPRS. The

results of the BUS probability analysis of 0.0165 <0.05 hypothesis were accepted, while the BPRS probability analysis of 0.0080 <0.05 hypothesis was accepted.

The capital stress test was calculated using the ECL approach conducted by researchers using a sample of 12 BUS and 3 BPRS from 2014-2022. The results of this study indicate that BPRS is better than BUS because the financing issued (EAD) by BUS is relatively higher than the financing issued (EAD) by BPRS. This also affects the calculation of expected losses (ECL) between BUS and BPRS.

The capital stress test was calculated using the ECL approach, and researchers used a sample of 12 BUS and 3 BPRS from 2014-2022. The results of this study indicate that BPRS is better than BUS because NPF and financing issued by BUS are relatively higher than NPF and financing issued by BPRS. This also affects the calculation of expected losses (ECL) between BUS and BPRS.

Research conducted by Bunga Islami et al. (2021) and Muwazir et al. (2018) explains that BPRS has a higher average efficiency level than BUS and performs better in terms of profit.

CONCLUSION

The researcher's conclusion regarding the capital stress test on BUS and BPRS for the period 2014-2022 with the expected credit loss approach is as follows:

1. The capital stress test assessment using the ECL approach on BUS for 2014-2022 with 12 samples showed that 6 BUS samples were still classified as stage 1 (performing), and BUS was declared still able to maintain the health of its capital.
2. The capital stress test assessment using the ECL approach on BPRS for 2014-2022 with three samples found 2 BPRS in stage 2 (underperforming) due to high NPF.
3. The difference in the capital stress test results using the ECL approach between BUS and BPRS was significant. This indicates that BPRS is better than BUS because financing issued (EAD) by BUS is relatively higher than NPF and financing issued by BPRS, thus affecting ECL.

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