

# PERFORMANCE COMPARISON BETWEEN ISLAMIC AND CONVENTIONAL BANKS USING MODIFIED TOPSIS WITH OBJECTIVE WEIGHTS

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## Introduction

The banking system acts as an intermediary between two parties that provides financial services to society, which oversees operating a payment system, taking deposits, providing loans and assisting with investments. Thus, efficiently measuring the performance of the banking sector is vital to beneficiaries who want to assess fiscal conditions and economic health. Hence, this study analysed the financial performance of Islamic and conventional banks in Malaysia. A total of seven Islamic banks and twelve conventional banks that were identified as the principal dealer's banks by the Bank Negara Malaysia (BNM) were observed in this study using the completed and consolidated financial statements of each bank from 2016 to 2020. Since 1979, regulators and policymakers recommended implementing the CAMELS rating system as an effective internal supervisory tool for evaluating and examining banks based on their financial performance (Johnes et al., 2009; Rozzani & Rahman, 2013; Desta, 2016).

Next, the performance was further analysed to compare the performance between Islamic and conventional banks using standard Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) and various methods of modified TOPSIS. The modified TOPSIS approach was used to overcome the drawbacks of standard TOPSIS such as the correlation between criteria, weight selection and distance measurement which may produce inconsistency in the outcomes (Odu, 2019). Finally, Spearman's rank correlation will be employed to conclude the best method for this study.

## Methodology

There are three phases in this study. Figure 1 shows the overall conceptual framework of this study. Phase 1 involved collecting the data from the financial statement and calculating eight financial ratios using CAMELS Rating System. In line with the study by Aspal and Dhawan (2016), this study will also employ eight financial ratios under CAMELS acronym that stands for Capital Adequacy (CA), Asset Quality (AQ), Management Efficiency (ME), Earning Quality (EQ), Liquidity (LI) and Sensitivity (S) as shown in Table 1.

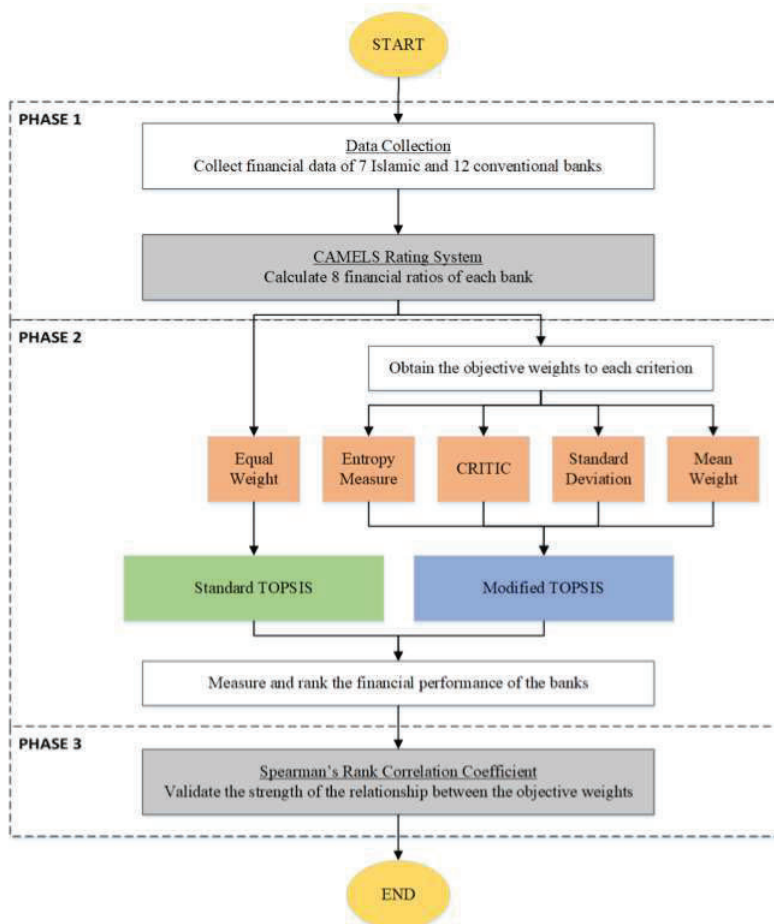


Figure 1: Conceptual Framework of the Study

Table 1: CAMELS Rating System

	Component	Symbol	Ratio
C	Capital Adequacy	C1	Capital Adequacy Ratio
A	Asset Quality	C2	Impaired Loans Ratio
M	Management Efficiency	C3	Administrative Expenses to Total Earnings
E	Earnings Quality	C4	Return on Asset
		C5	Return on Equity
L	Liquidity	C6	Liquid Assets to Total Deposits
		C7	Liquid Assets to Total Assets
S	Sensitivity	C8	Total Securities to Total Assets Ratio

Phase 2 was to measure and rank the financial performance of selected banks using standard TOPSIS and modified TOPSIS. For the modified TOPSIS, there were four objective weighting methods proposed which are Entropy Measure (EM), Criteria Importance Through Intercriteria Correlation (CRITIC), Standard Deviation (SD) and Mean Weight (MW). The final phase, Phase 3 was to validate the strength of the relationship between the average of eight financial ratios with TOPSIS and various objective weighting methods in modified TOPSIS.

## Result and Discussion

### 1. CAMELS Rating System

Table 2 shows the rating analysis of CAMELS for the sample of banks used in this study. Later, each bank was ranked based on the total rating attained using financial ratios as the criteria listed in Table 1. As shown, most of the criteria of the banks were frequently rated 1, 2 and 3. Observed that, the lower the rate, the better the ranks of the banks. A13 is on the list of the top with rank 1. Followed by A3 until A10 and A16 until A18 was ranked 2, while A2, A5, A8, A11, A15 and A19 were ranked 3. In contrast, A1, A6, A7 and A14 with rank 4 and A12 ranked 5 indicated poor financial performances among the banks observed.

### 2. Standard TOPSIS and Modified TOPSIS

Standard TOPSIS used equal weights while modified TOPSIS used various methods to calculate the objective weighting for each criterion. As a result, each of the methods produces different ranking outcomes.

Observed that from Table 3, four Islamic banks are constantly in the top 10 which are CIMB Islamic Bank Berhad (A4), Hong Leong Islamic Bank Berhad (A5), Maybank Islamic Berhad (A6) and RHB Islamic Bank Berhad (A7). While there are two Islamic banks attaining the lowest rank namely Affin Islamic Bank (A1) and Ambank Islamic Berhad (A2).

On the other hand, JP Morgan Chase Bank Berhad (A13) consistently ranks first due to its highest-performing index as compared to other conventional banks. Followed by Citibank Berhad (A10), OCBC Bank Malaysia Berhad (A15) and Standard Chartered Bank Malaysia Berhad (A18). According to the findings, conventional banks' have higher efficiency than Islamic banks in Malaysia.

### 3. Spearman's Rank Correlation Coefficient

Based on Hauke and Kossowski (2011), Spearman's rank correlation coefficient is a common non-parametric (distribution-free) approach which is used to determine the strength of the relationship between variables. Sedgwick (2014) stated Spearman's rank correlation coefficient is measured on a scale ranging from -1 to +1.



Table 2: CAMELS Rating Analysis of the Selected Islamic and Conventional Banks

CAMELS ratios	C1	C2	C3	C4	C5	Average rate	C6	C7	Average rate	C8	Rank								
Banks																			
A1	17%	1	1%	2	4%	1	1%	1	19%	2	1	26%	1	21%	5	3	90%	5	4
A2	15%	1	1%	2	5%	1	2%	1	26%	1	1	31%	1	24%	5	3	90%	5	3
A3	17%	1	1%	1	7%	1	2%	1	34%	1	1	33%	1	25%	5	3	86%	5	2
A4	16%	1	1%	1	22%	1	1%	1	28%	1	1	30%	1	25%	5	3	85%	5	2
A5	14%	1	1%	1	28%	2	1%	1	25%	1	1	27%	1	24%	5	3	94%	5	3
A6	19%	1	1%	1	33%	3	1%	1	39%	1	1	21%	1	17%	5	3	88%	5	4
A7	15%	1	1%	1	34%	3	1%	1	22%	1	1	23%	1	21%	5	3	90%	5	4
A8	16%	1	2%	2	7%	1	2%	1	26%	1	1	37%	1	28%	5	3	87%	5	3
A9	17%	1	2%	2	6%	1	2%	1	25%	1	1	48%	1	35%	4	2	85%	5	2
A10	19%	1	1%	1	23%	1	5%	1	40%	1	1	41%	1	32%	5	3	77%	5	2
A11	15%	1	1%	1	5%	1	2%	1	21%	2	1	37%	1	30%	5	3	92%	5	3
A12	21%	1	3%	3	16%	1	2%	1	22%	2	1	36%	1	26%	5	3	82%	5	5
A13	26%	1	1%	1	30%	2	3%	1	23%	1	1	126%	5	77%	1	3	35%	3	1
A14	19%	1	2%	2	12%	1	1%	1	12%	3	2	55%	1	36%	4	2	84%	5	4
A15	18%	1	1%	2	18%	1	2%	1	33%	1	1	29%	1	24%	5	3	89%	5	3
A16	16%	1	0%	1	2%	1	2%	1	23%	1	1	21%	1	17%	5	3	93%	5	2
A17	16%	1	2%	2	5%	1	2%	1	23%	1	1	42%	1	33%	4	2	87%	5	2
A18	16%	1	2%	2	14%	1	3%	1	35%	1	1	47%	1	36%	4	2	77%	5	2
A19	19%	1	1%	2	11%	1	2%	1	30%	1	1	27%	1	24%	5	3	82%	5	3

\* Σr = Sum of the eight ratios ratings of each bank; n = Number of ratios (i.e. 8)  
 \*\* A1=Affin Islamic Bank; A2=Ambank Islamic Berhad; A3=Bank Islam Malaysia Berhad; A4=CIMB Islamic Bank Berhad; A5=Hong Leong Islamic Bank Berhad; A6=Maybank Islamic Berhad; A7=RHB Islamic Bank Berhad; A8=Ambank (M) Berhad; A9=CIMB Bank Berhad; A10=Citibank Berhad; A11=Hong Leong Bank Berhad; A12=HSBC Bank Malaysia Berhad; A13=JP Morgan Chase Bank Berhad; A14=Malayan Banking Berhad; A15=OCBC Bank (Malaysia) Berhad; A16=Public Bank Berhad; A17=RHB Bank Berhad; A18=Standard Chartered Bank Malaysia Berhad; A19=United Overseas Bank (Malaysia) Berhad  
 \*\*\* Note that the specific ratings of CAMELS are in line with Table 2 and 4 above.

Table 3: Ranking of 19 Banks as Principal Dealers in Malaysia

Bank		Standard TOPSIS		Modified TOPSIS							
				EM		CRITIC		SD		MW	
		Index	Rank	Index	Rank	Index	Rank	Index	Rank	Index	Rank
A1	Affin Islamic Bank	0.2216	19	0.2022	19	0.2429	19	0.2189	19	0.2216	19
A2	Ambank Islamic Berhad	0.2499	18	0.2151	18	0.2701	18	0.2474	18	0.2499	18
A3	Bank Islam Malaysia Berhad	0.3712	8	0.3584	11	0.3868	10	0.3724	9	0.3712	8
A4	CIMB Islamic Bank Berhad	0.3786	7	0.4347	6	0.4132	8	0.4001	7	0.3786	7
A5	Hong Leong Islamic Bank Berhad	0.4130	5	0.4869	5	0.4531	6	0.4396	5	0.4130	5
A6	Maybank Islamic Berhad	0.4500	3	0.5171	2	0.4912	3	0.4794	3	0.4500	3
A7	RHB Islamic Bank Berhad	0.4162	4	0.5036	4	0.4588	5	0.4476	4	0.4162	4
A8	AmBank (M) Berhad	0.2998	14	0.2816	14	0.3168	14	0.2991	14	0.2998	14
A9	CIMB Bank Berhad	0.2978	15	0.2499	16	0.3052	15	0.2904	15	0.2978	15
A10	Citibank Berhad	0.5090	2	0.5124	3	0.5340	2	0.5264	2	0.5090	2
A11	Hong Leong Bank Berhad	0.3606	10	0.3613	10	0.3739	11	0.3582	10	0.3606	10
A12	HSBC Bank Malaysia Berhad	0.2517	17	0.2537	15	0.2773	17	0.2636	16	0.2517	17
A13	J.P Morgan Chase Bank Berhad	0.7780	1	0.8635	1	0.7560	1	0.7800	1	0.7780	1
A14	Malayan Banking Berhad	0.3498	11	0.3656	9	0.4683	4	0.3491	11	0.3498	11
A15	OCBC Bank (Malaysia) Berhad	0.3670	9	0.3828	8	0.3978	9	0.3826	8	0.3670	9
A16	Public Bank Berhad	0.3438	12	0.3499	12	0.3593	12	0.3437	12	0.3438	12
A17	RHB Bank Berhad	0.2672	16	0.2178	17	0.2778	16	0.2597	17	0.2672	16
A18	Standard Chartered Bank Malaysia Berhad	0.4097	6	0.3828	7	0.4228	7	0.4146	6	0.4097	6
A19	United Overseas Bank (Malaysia) Berhad	0.3282	13	0.3225	13	0.3484	13	0.3343	13	0.3282	13

Table 4: List of Method and Its Average Ratio

Method	Average Ratios
TOPSIS	0.2724
EM	0.2542
CRITIC	0.2682
SD	0.2719
MW	0.2724

Observed that, this study also found that there exists a positive relationship between the average of eight financial ratios and each method of TOPSIS either standard or modified. From table 4, this study also suggests that TOPSIS and modified TOPSIS with MW approach can reflect the decision information emitted by eight financial ratios effectively with average ratios of 0.2724 respectively.

## Conclusion

Banks are advised to apply a composite CAMELS rating model regularly to assess the financial soundness and health of the banks. Based on the result, the overall performance of 19 principal dealers' banks in Malaysia is primarily in satisfactory condition. By comparing the performance between Islamic and conventional banks using standard TOPSIS and modified TOPSIS, the results showed bank A13 (conventional bank) appeared ranked first which indicates the best performing bank meanwhile A1 (Islamic bank) ranked last that Hence, by using the Spearman's Rank Correlation Coefficient this study found that the TOPSIS method and modified TOPSIS with MW as its objective weight are the best methods as compared to other methods proposed previously. Finally, this study aims to highlight the concept of TOPSIS and various modified TOPSIS and successfully demonstrated its applications in real-life problems.

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