

FORECAST THE PROFITABILITY OF ISLAMIC BANKS IN MALAYSIA BASED ON ISLAMIC INTERBANK RATE

Husnul Adib bin Muhamad Amin¹, Muhammad Alif bin Izani², Ahmad Aqil bin Ahmad Azam³, Muhammad Hazim bin Nordin⁴ and Nur Amalina Shafie⁵

^{1,2,3,4}Fakulti Sains Komputer dan Matematik, Universiti Teknologi MARA Shah Alam,

⁵Fakulti Sains Komputer dan Matematik, Universiti Teknologi MARA Cawangan Negeri Sembilan Kampus Seremban

Corresponding author: amalina@uitm.edu.my

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1. Introduction

Islamic banking is one of the trusted banking systems used in Malaysia. While the international banks have been a common staple choice around the globe, Islamic banks have risen in popularity as well as their numbers. This is due to the need of a trusted and reliable banking system which will keep their finances safe (Hachicha and Amar, 2015). The rules that govern commercial transactions in Islamic Banking are referred to as Fiqh al-muamalat. Fiqh al-muamalat can be defined as the rulings governing commercial transactions between the parties involved (Jalil et al., 2014). Islamic bank has developed ways on how to gain profit following sharia's. Malaysia is one of the countries that have implemented the concept of Islamic finance in its banking industry. As collectively, there are 16 Islamic Banks (excluding development financial institutions) in Malaysia. Bank Negara Malaysia (BNM) acts as an organisation that administers the financial objective of the country and is following two-way banking practises: Islamic and conventional banking systems. Since Malaysia is a country, whose religion is mainly Islam, Shariah requirement must be complied with as the principle of banking operations.

Malaysian Islamic Banking currently entering global financial and economic crisis. Part of the banking sector have significantly strengthened the foundations for financial stability. In this circumstance, to identify the bank's profitability determinants is important because by knowing the variables that affecting the bank's profit. Moreover, one of the importance in identifying banks' profitability determinants is to adjust the performance of the bank to maximize profit. The capital, liquidity, operational efficiency, asset quality, inflation rate and gross domestic product (GDP) affect the profitability of Islamic Bank in Malaysia (Javaid and Alalawi, 2018). Liquidity is one of the main factors affecting the probability on Islamic Bank in Malaysia. Liquidity of a bank is related with interbank rates on behalf of model estimates changes according to central bank. The interbank loan can be as large as with perfect diversification since the interbank rate does not depend on the correlation of banks' loan portfolios. The reason for this is that when there are no interbank ties, correlation has no effect on bank activity. As a result, it will have no bearing on the terms of an interbank loan that is acceptable to the bank. If the interbank lender has a minor funding gap, its number of business loans will be lower if the correlation is larger, whereas the volume of business loans issued by the interbank borrower will be the same as if 100% diversification is achieved (Dietrich and Hauck, 2020)

Interbank, in general, allow banks to better manage, pool, and redistribute their funds, allowing them to provide more efficient lending and deposit services. The interbank overnight market is arguably the most important. It is an important part of a country's monetary and payment system, as well as a vital safety valve for banks (Green et al., 2016). One of the way Islamic banks gain profits is trough Interbank Rate. In replacement of conventional interbank rates which do not comply with the shariah requirements, the Islamic interbank rate (IIR) was established. The Islamic interbank rate now allows Islamic banks to make profit in accordance with Sharia law (Muhammad et al., 2012). BNM established the Islamic Interbank Money Market (IIMM) in 1994 to meet its interest rate target for the Islamic banking sector. The surplus and deficit in

institutional funds were traded between institutions through this market, depending on Shariah rules and the agreed-upon funding rate (Muhammad et al., 2012). Unfortunately, there have not been many studies on liquidity is a factor that affecting the profitability on Islamic Bank in Malaysia. Therefore, the objectives of this study are to determine the best model to forecast the profitability of Islamic Bank in Malaysia based on Islamic Interbank Rate and to predict the profitability of Islamic Bank in Malaysia interbank rate from April 2021 until December 2021.

2. Methodology

In this research study, the Islamic Interbank Rate are in form of overnight data from January 2016 until March 2021 are used from Bank Negara Malaysia. All the analysis will be conducted by using the RStudio. Figure 1 is a flowchart process to forecast Islamic Interbank Rate.

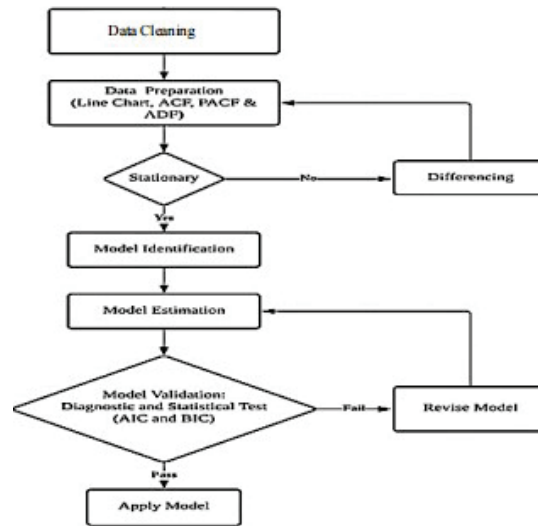


Figure 1: Flowchart Forecasting Process

3. Result and Discussion

Based on Table 1, the best forecast model that suit the data is ARMA(1,1) rather than AR(1), AR(2), ARIMA(2,2,0), and MA(1). This is determined by comparing the error measures such as AIC, MAE, and MAPE for each model. ARMA(1,1) has the lowest AIC(-153.80), MAE(0.02445) and MAPE(0.7929) compared with other models which indicate that this model is the best model. Supported by the Figure 2 and Figure 3 which is shows that ACF and PACF plot, we can roughly determine the starting point for our ARIMA(p, d, q) model.

Table 1: Five ARIMA Models

Models	AIC	MAE	MAPE
P = 1, D = 0, Q = 1 ARMA(1,1)	-153.80	0.02445	0.7929
P = 1, D = 0, Q = 0 AR(1)	-149.61	0.02493	0.8125
P = 2, D = 0, Q = 0 AR(2)	-153.47	0.02541	0.8244
P = 2, D = 2, Q = 0 ARIMA(2,2,0)	-136.39	0.02839	0.9311
P = 0, D = 0, Q = 1 MA(1)	-114.21	0.06818	2.0452

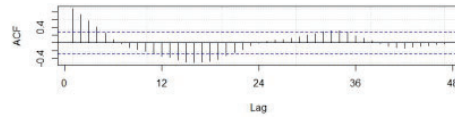


Figure 2: ACF for Monthly Islamic Interbank Rate of Islamic Bank

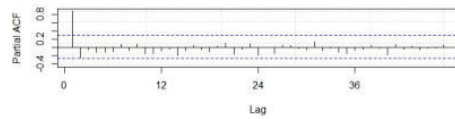


Figure 3: PACF for Monthly Islamic Interbank Rate of Islamic Bank

Since the ACF and PACF plot for the estimation part shows that the model is not stationary, hence it undergoes first differencing and replot the ACF and PACF. In the first differencing, it illustrates that the data is stationary with 1 significant spike for each ACF and PACF ($p=1$ and $q=1$) as shown in the Figure 4 and Figure 5.

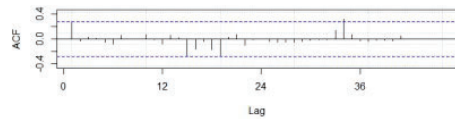


Figure 4: ACF for First Differencing Monthly Islamic Interbank Rate of Islamic Bank

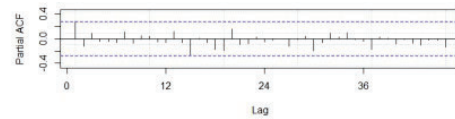


Figure 5: PACF for First Differencing Monthly Islamic Interbank Rate of Islamic Bank

Then the model is applied onto the evaluation part to estimate the forecast values of the data for the next 9 months. Hence, we obtained the forecast values for Islamic interbank rate in Malaysia from April 2021 until December 2021 as shown in the Figure 6. From the forecasted values, we can conclude that Islamic interbank rate for Islamic banks in Malaysia increases from April 2021 to December 2021. This shows that even during this pandemic, Islamic banks in Malaysia will stay profitable.

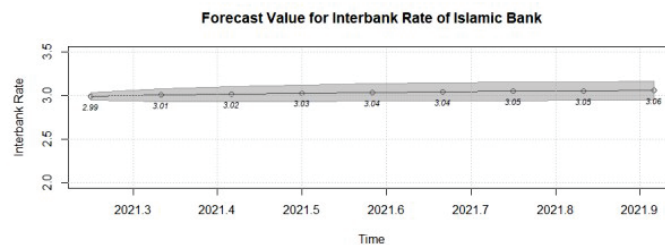


Figure 6: Forecast Interbank Rate

4. Conclusion

Banking is an essential component and practically used in our daily life across the world. Islamic banking is one of the trusted banking systems used in Malaysia. While the international banks have been a common staple choice around the globe, Islamic banks have risen in popularity as well as their numbers. The Conventional bank and Islamic Bank can be differentiated in such that the conventional banks are limited to monetary market and to monetary affairs with a purpose to gain monetary benefits in wrongly or rightly ways while Islamic Bank is directive as defined for the betterment of socioeconomic development as the benefit of society. The capital, liquidity, operational efficiency, asset quality, inflation rate and gross domestic product (GDP) affect the profitability of Islamic Bank in Malaysia. This research is done to determine the best model to forecast the profitability of Islamic Bank in Malaysia based on Interbank Rate hence predict the profitability of Islamic Bank in Malaysia interbank rate from April 2021 until December 2021. The data is separated into two parts, estimation parts and evaluation parts. Estimation parts is to find the best forecast model that suits the data by obtaining the lowest Akaike Information Criterion (AIC), lowest Mean Average Error (MAE) and Mean Average Percentage Error (MAPE) while evaluation part is used to forecast the model. Our finding shows that the best forecast model that suit the data is ARMA(1,1) since it has the lowest AIC, MAE, and MAPE compared to other models showing that it is the best model to use for forecasting the data obtained. The model is then applied to the evaluation part for the forecasting value from April 2021 to December 2021 to be obtained for expected value of Islamic interbank rate in Malaysia. The results show that the Islamic interbank rate will increase gradually by month which signify the increase in profitability of Islamic Bank in Malaysia.

References

- Dietrich, D. and Hauck, A. (2020). Interbank borrowing and lending between financially constrained banks. *Economic Theory*, 70(2):347–385.
- Green, C., Bai, Y., Murinde, V., Ngoka, K., Maana, I., and Tiriongo, S. (2016). Overnight interbank markets and the determination of the interbank rate: A selective survey. *International Review of Financial Analysis*, 44:149–161.
- Hachicha, N. and Amar, A. B. (2015). Does Islamic bank financing contribute to economic growth? The Malaysian case. *International Journal of Islamic and Middle Eastern Finance and Management*, 8(3):349–368.
- Jalil, A., Ramli, A. M., and Shahwan, S. (2014). The four introductory theories of fiqh muamalat. *Wisdom Publication*.
- Javaid, S. and Alalawi, S. (2018). Performance and profitability of Islamic banks in Saudi Arabia: An empirical analysis. *Asian Economic and Financial Review*, 8(1):38–51.
- Muhammad, F., Sulaiman, A., Hussien, M., and Razak, A. A. (2012). Does islamic interbank rate influence bank characteristics and economic cycle in malaysian monetary transmission? *Asian Journal of Finance & Accounting*, 4(2):131–143.