

Overcoming Asymmetric Information with A Profit Sharing System at Bank Sharia : Acceleration of Theory and Practice

¹MUAIDY YASIN, ²LALU MUH. KABUL, ³LALU EDY HERMAN

^{1,3}Faculty of Economics and Business, University of Mataram, INDONESIA

²Faculty of Information and Communication Technology, University of Technology Mataram,
INDONESIA

Abstract: This study aims to examine the profit-sharing system in Islamic banks in overcoming the adverse selection issue and the practice of implementing the profit-sharing system. In this study, evaluative and descriptive methods were used. The results of this study indicate that theoretically the issue of asymmetric information can be overcome by a profit-sharing system in Islamic banks. In practice, the profit-sharing system has been implemented at Bank NTB Syariah as a superior product in productive financing. The market share of the profit-sharing system at Bank NTB Syariah was at 64.73 percent in 2019 and increased to 68.55 percent in 2020 with a growth of 35.78 percent. The Covid-19 pandemic does not significantly affect the health condition of Bank NTB Syariah where Bank NTB Syariah remains relatively healthy before and after the Covid-19 pandemic.

Keywords: Asymmetric information, profit-sharing, Adverse Selection, Islamic Bank

Received: May 9, 2022. Revised: May 13, 2023. Accepted: June 19, 2023. Published: July 12, 2023.

1. Introduction

Information is a highly important commodity in this world. In the business world there is information that is owned by each party (Avdasheva & Yakovlev, 2010). Perfect information is certainly needed for the smooth running of a business activity because it is related to the efficiency of a business activity. The existence of information will have its own costs, so there will be efforts by each party involved in the business to hide information (Thadden, 2004). Some parties may get more information than others and this is called asymmetric information (Abdul *et al.*, 2020; Xue & Zhang, 2019). Basically, information asymmetry occurs if the company has more information about the product than the buyer, although the opposite condition may also occur.

In economic theory, information asymmetry was developed by three economists who won the 2001 Nobel Prize in Economics, namely Akerlof, Spence, and Stiglitz. Asymmetric Information was used by George Akerlof in his 1970 work: *The Market for Lemons*. He mentioned that, in such a market, the average value of commodities tends to fall, even for goods that are classified as good quality. Sellers who do not have good intentions will deceive buyers by giving the impression as if the goods they sell are good, this is what gives rise to Adverse Selection. Adverse Selection is how the selection of decisions to be taken based on weak information (Chen *et al.*, 2014; Christie, 2014; Herman *et al.*, 2018). Thus, many fraud-evading buyers refuse to make transactions in such markets or refuse to spend big money in such transactions (Albaity & Rahman, 2019; Grassa, 2012). As a result, sellers who actually sell good goods

are not selling because buyers value their products as cheap, and eventually, the market will be filled with poor quality goods.

The Regional Development Bank of West Nusa Tenggara (Bank NTB Syariah) is a Bank owned by the Government of the Province of West Nusa Tenggara which was established and started operations on 5th July 1964 as a conventional bank. The conversion of Bank NTB to Bank NTB Syariah officially carried out operational activities according to sharia principles on September 24, 2018. West Nusa Tenggara Province is an area that has a Muslim majority population. So, many activities carried out by the society tend to follow the general habits of the Muslim community. Bank NTB Syariah, during the conversion to Islamic banking, has shown a great performance. The conversion of Bank NTB Syariah has increased Islamic banking assets in Indonesia by 7.26 trillion rupiah (OJK, 2019).

Stiglitz and Weiss (1981) have discussed asymmetric information in relation to credit markets. Stiglitz and Weiss stated that in the credit market only borrowers know the risks of the business activities (projects) that will be funded with the credit. The high-risk business by the borrowers is reported to the bank as a low-risk business. As a result, borrowers fail to repay credit loans because their business is actually high risk. This causes the bank to suffer losses. The credit market is filled with high-risk businesses where the demand for credit by borrowers for high-risk businesses is increasing. Finally, banks raise interest rates as a filtering tool by limiting the supply of credit even though banks have excess funds to lend or known as credit rationing (Johan & Putit, 2016). One fundamental lesson from the imperfection of information is the act of conveying information. In the banking world, customers are usually in a weak bargaining position and therefore can become targets of exploitation

from business actors who are socio-economically strong, especially in the case of business actors or banks apply standard agreements (Khmous & Besim, 2020; Mbawuni & Nimako, 2017). Many cases occur due to information asymmetry or inequalities of knowledge and bargaining power (Thadden, 2004).

This study aims to examine the profit-sharing system in Islamic banks in overcoming the issue of asymmetric information, namely adverse selection which previously has been researched by Abdul *et al.*, (2020) and Bakhtiar and Sugema (2012). The results of research show that based on the theoretical dimensions of the phenomenon of adverse selection in conventional banks, it can be overcome with a profit-sharing system in Islamic banks. This study is different from the previous research where the focus of this research is not only on the theoretical dimension but on the theoretical and practical dimensions. On the other hand, based on research by Iqbal Zamir (2007) and Mervyn KL (2010) that the practice of profit sharing systems in Islamic banks is still relatively poor. From the practical dimension, this study is different from previous research where here the verification of previous research will be carried out. On the other hand, the locus of previous research is global Islamic banks (Iqbal Zamir, 2007; Iqbal Zamir and Mirakhor, 2013), while the locus of this study is regional Islamic banks, namely Bank NTB Syariah.

2. Literature Review

Islamic bank is a bank that operates based on the principles of Islamic sharia with reference to the Qur'an and Hadith. In its transactions, Islamic banks apply a profit-sharing system, different from conventional banks that apply interest (*usury*). In terms of risk in conventional banks, the risk is only borne by the customer. Whereas in Islamic banks, the risk is shared by the bank and the

customer (Greuning and Iqbal, 2008; Askari H et al, 2015). In the context of usury which means addition and growth is prohibited as stated in the Qur'an in QS Al-Baqarah 2:275-281 then Ali Imran 3:130-131 and An-Nisa 4:160-161 (Chapra, 2008).

Referring to the theoretical dimension using a mathematical model that asymmetric information issue, namely adverse selection in conventional banks can be overcome by a profit-sharing system in Islamic banks (Bakhtiar and Sugema, 2012). First, the discussion focuses on adverse selection in conventional banks. Second, the discussion of the profit-sharing system in Islamic banks to overcome adverse selection in conventional banks. For example, there are two types of businesses (projects) namely X and Y. The opportunities for business X and Y to succeed are P_x and P_y , respectively. While the chances of the two types of businesses to fail are $1-P_x$ and $1-P_y$, respectively. The acceptance from project x is $R(x)$ if project X is successful and 0 (zero) if it fails. The acceptance from project y is $R(y)$ if project Y is successful and 0 (zero) if it fails. The expected value or expectation (E) of business x is $E[R(x)]=P_xR_x$ and the expected value of work y is $E[R(y)]=P_yR_y$.

For businesses X and Y, each requires a capital amount of K, all of which are credit loans from banks. On the other hand, the bank is assumed to be risk-neutral with an interest rate of r; so that the revenue from a risky business is greater than r, i.e. $r < r_y < r_x$. This means that the riskier business, namely X, is subject to a higher interest rate (r_x) than the interest rate of the less risky business Y (r_y). Bank revenue (R) from business X or Y is $R=(1+r)K$. In the context of "adverse selection", the borrower who owns business X lies to the bank that the condition he reports to the bank is not business X which is riskier, but business Y which is less risky as in the following equation:

$$(1) \quad E\{R(x)|r_y < r_x\} = P_x(1+r)K < (1+r)K$$

Based on equation (1) the bank suffers a loss. Banks cannot differentiate a business based on risk, so the bank applies a single interest rate "rk". The proportion of business X from the project population is γ and business Y is $(1-\gamma)$. Hence, the relationship between r and rk is expressed in the following equation:

$$(2) \quad 1 + rk = \frac{1+r}{\gamma P_x + (1-\gamma)P_y}$$

Based on equation (2) because $0 < P_x < P_y < 1$, the result is $r < rk$. Then, the magnitude of r_x and r_k can be compared in the following equation:

$$(3) \quad r_x - r_k = \frac{(1+r)(1-\gamma)(P_y - P_x)}{P_x[\gamma P_x + (1-\gamma)P_y]}$$

Based on equation (3), we get $r_x - r_k > 0$ or $r_x > r_k$ in the same way we get $r_y < r_k$ where the relationship of r, r_k , r_x , and r_y can be expressed in the following inequality:

$$(4) \quad r < r_y < r_k < r_x$$

Based on inequality (4), it is found that in conventional banks, less risky businesses (Y) are subject to higher interest rates ($r_y < r_k$), while riskier businesses (X) are subject to lower interest rates ($r_k < r_x$) resulting in an "adverse selection" where the credit market is filled with high-risk businesses that shift low-risk businesses.

With the profit-sharing system at Islamic banks, from capital investment (K) in business activities a return rate of ρ is obtained. In conventional banks ρ corresponds to r (interest rate). If the business is successful, the bank will get a profit-sharing ratio α and if it fails, the Islamic bank will not get anything. The "opportunity cost"

for the profit-sharing system at Islamic banks with the assumption that the bank is risk-neutral is shown in the following equation:

$$(5) \quad (1 + \rho)K = \alpha E(R(i))$$

With $i \in \{X, Y\}$ and $E[R(i)] = P_i R_i$, we get equation (6) as follows:

$$(6) \quad \alpha = \frac{(1+\rho)K}{P_i R_i}$$

Based on equation (6) the amount of profit-sharing ratio (α) depends on the magnitude of the opportunity cost ρ , the capital invested (K), the probability of success (P_i), and the acceptance of the venture when successful (R_i). This reflects that the determination of profit sharing ratio in Islamic banks is more comprehensive than conventional banks because it considers more factors. Since it is assumed that $E[R(x)] = E[R(y)]$ and K are also the same for both types of businesses (projects), then the following equation is obtained:

$$(7) \quad \alpha = \frac{(1+\rho)K}{P_x R_x} = \frac{(1+\rho)K}{P_y R_y}$$

Equation (7) states that the profit-sharing ratio (α) is universal, which means that Islamic banks apply a single profit-sharing ratio for all businesses (projects). With this situation, business (project) X which is riskier can no longer be reported as business Y which is less risky. At the same time, it is not only risk that determines the profit-sharing ratio, but also revenue. Thus, as long as risk can be compensated by revenue, the profit-sharing ratio will remain the same and as long as revenue expectations are the same, the problem of "adverse selection" will not arise. In other words, the problem of asymmetric information, namely "adverse

selection" in conventional banks can be overcome with a profit-sharing system in Islamic banks.

3. Research Methods

3.1. Approach

Approaches in economic research include descriptive, predictive, and evaluative (Sen, 2014). In this study, an evaluative approach was used to evaluate the problem of asymmetric information, namely "adverse selection" in conventional banks; then the problem is solved using Islamic banks based on a profit-sharing system. On the other hand, a descriptive approach was used to describe the practice of implementing a profit-sharing system in Islamic banks. In this study, a survey method was used with Bank NTB Syariah as the sample determined based on purposive sampling with the considerations: (1) the market share of Bank NTB Syariah assets reached 61.37 percent compared to other Islamic banks in NTB, (2) market share of Bank NTB Syariah financing reached 66.19 percent compared to other Islamic banks in NTB, (3) Bank NTB Syariah third party funds market share reached 79.91 percent compared to other Islamic banks in NTB (Bank NTB Syariah, 2020).

3.2. Variables and Data Sources

The variables of this study consisted of theoretical variables including Islamic banks, conventional banks, adverse selection, and practice variables including financing, financial ratios. Sources of theoretical variable data were obtained from various works of relevant literature for this study. While the source of the practice variable data was obtained from the Bank NTB Syariah.

3.3. Data Analysis

In this study, data analysis includes theoretical variables and practical variables. The theoretical variable data was analyzed

using a mathematical model (Samarskii and Mikhailov, 2018). The practice variable data were statistically analyzed using the Mann-Whitney U test (Siegel, 2017).

4. Results and Discussion

In 2020, the world community witnessed the emergence of a new type of corona virus that causes coronavirus diseases or what is now known as Covid-19. The virus initially spreaded in Wuhan, Hubei Province, China on 1st December 2019 then quickly spreaded out to various parts of the world. Then on 11th March 2020, Covid-19 was declared as a pandemic by WHO (Bappenas, 2021). In Indonesia, Covid-19 was detected on 2nd March 2020 and since then its spread has not been stopped. The Covid-19 pandemic in NTB first appeared on March 24, 2020 (BPS NTB, 2020).

Even though NTB is faced with the Covid-19 pandemic, the financing growth of Bank NTB Syariah in 2020 was recorded at 14.85 percent (YoY) which was greater than the growth in regional banking credit distribution of 12.59 percent and national banking which actually experienced a contraction of minus (-2.40 percent). On the other hand, the growth of Islamic banking financing nationally in 2020 was 8.1 percent (YoY) (Bank NTB Syariah, 2020). Bank NTB Syariah financing included consumptive financing and productive

financing with growth in 2020 of 13.59 percent (YoY) and 28.21 percent (YoY), respectively.

The productive financing of Bank NTB Syariah as shown in table 1 is mostly a product of the profit-sharing system (*shirkah*) in skimmed form *musharakah* with a market share of 64.73 percent in 2019 then increased to 68.55 percent in 2020 with a growth of 35.78 percent. *Musharakah* is a collaboration between Islamic banks and customers for a particular business in which each party contributes capital with the risk of profit and loss being shared in accordance with the profit-sharing ratio agreed in the contract (Hasan and Lewis, 2007; Iqbal and Mirakhor, 2013). In addition to the profit-sharing system, Bank NTB Syariah productive financing also includes *receivables Murabahah* with a market share in 2019 and 2020 of 35.27 percent and 28.69 percent, respectively. *Murabahah* is a sale and purchase transaction in which the Islamic bank acts as the seller, while the customers as the buyer with the price is the purchase price from the supplier plus the agreed profit (Antonio, 2003; Hasan and Lewis, 2007). In addition, Bank NTB Syariah also has productive financing in the form of *qard* with a market share of 1.76 percent in 2020. *Qard* is a loan agreement given by Islamic banks to customers with conditions that must be returned at a mutually agreed time (Askari *et al*, 2015; Greuning and Iqbal, 2008).

Table 1. Productive Financing for Bank NTB Syariah 2019-2020

| Description | 2019 | | 2020 | | Growth (%) |
|-----------------------|------------------------------|--------|------------------------------|--------|------------|
| | Nominal (millions of rupiah) | % | Nominal (millions of rupiah) | % | |
| Murabahah Receivables | 169,480 | 35.27 | 182,942 | 29.69 | 7.94 |
| Musharakah financing | 311,088 | 64.73 | 422,380 | 68.55 | 35.78 |
| Qard Financing | - | 0.00 | 10,814 | 1.76 | 100.00 |
| Total | 480,568 | 100.00 | 616,136 | 100.00 | 28.21 |

Source: Bank NTB Syariah 2020 (processed)

In addition to Bank NTB Syariah, it is noted that the productive financing of the National Islamic Bank is also a product of the profit-sharing system (shirkah) as shown in table 2 with a market share of 61.89 percent in 2019 and increased to 64.56 percent in 2020. Meanwhile, the profit-sharing system for the National Sharia Bank includes a skim of musharakah and mudharabah. Market share musharakah in 2019 and 2020 by 89.91 percent and 91.89 percent, respectively. Meanwhile, the market share of mudharabah in 2019 by 10.09 percent and 8.11 percent in 2020 (OJK, 2021). The results of this study are different from the research of Iqbal Zamir (2007) where productive financing on profit-sharing products (shirkah) in global Islamic

banks was low at only 2.93 percent and was dominated by buying and selling products in the form of receivables murabahah by 83.53 percent. On the other hand, the results of this study are also different from the research of Mervyn KL (2010) where the profit-sharing system (shirkah) was still relatively low in Pakistan with 2 percent, Arab Gulf countries 11 percent, South Asia 13 percent, and Southeast Asia only 1 percent. In other words, the profit-sharing system (shirkah) at Bank NTB Syariah has been implemented in the form of practice as a superior product for productive financing. Likewise with the National Islamic Bank where the profit-sharing system (shirkah) becomes a superior product for productive financing.

Table 2. Market Share of Profit-Sharing for Bank NTB Syariah and National Islamic Banks

| Description | Profit Sharing Market Share (%) | |
|-----------------------|---------------------------------|--------|
| | 2019 | 2020 |
| Bank NTB Syariah | 64.73% | 68.55% |
| National Islamic Bank | 61.89% | 64.56% |

Source: Bank NTB Syariah 2020 (processed) and OJK (2021) (processed)

Profit-sharing system (shirkah) of National Islamic Banks was dominated by skim of musharakah amounted to 89.91 percent in 2019 then increased to 91.89 percent in 2020. Other skims in the profit-sharing system of the National Islamic Bank are: mudharabah by 10.09 percent in 2019 and 8.11 percent in 2020 (OKJ, 2021). Mudharabah is profit sharing between customers as owners of funds or capital (shahibul maal) with Islamic banks as fund managers (mudharib) based on a mutually agreed profit-sharing ratio (Hasan and Lewis, 2007; Iqbal and Mirakhor, 2013).

The performance of Islamic banks is measured using financial ratios which include liquidity ratio, solvency ratio, profitability ratio, and the ratio of Non-

Performing Loans/NPLs (Kasmir, 2012; Antonio, 2013). The performance of Islamic banks, apart from using financial ratios, can also be measured using “economic value added”/EVA (Endri and Wakil, 2018). At Bank NTB Syariah, the liquidity ratio is measured using the Financing to Deposit Ratio/FDR, the solvency ratio is measured using the Capital Adequacy Ratio (CAR), and the profitability ratio to measure the level of profitability and business efficiency. The level of profitability is measured using Return on Assets (ROA), Return on Equity (ROE), Net Profit Sharing (NPS). While the level of business efficiency is measured using Operational Costs on Operational Revenues (BOPO). The financial ratios of Bank NTB Syariah are shown in table 3.

Table 3. Bank NTB Syariah Financial Ratios 2019-2020

| Description | 2019 | | 2020 | |
|---|--------|-------|--------|-------|
| | Ratio | Score | Ratio | Score |
| Financing to Deposit Ratio (FDR)/LDR | 81.89% | 4 | 86.53% | 3 |
| Capital Adequacy Ratio (CAR) | 35.47% | 5 | 31.60% | 5 |
| Return on Assets (RAO) | 2.56% | 5 | 1.74% | 5 |
| Return on Equity (ROE) | 12.05% | 3 | 9.54% | 3 |
| Net Profit Sharing (NPS) | 5.51% | 5 | 4.38% | 5 |
| Operational Costs/Operational Revenues (BOPO) | 76.83% | 5 | 81.39% | 5 |
| Non Performing Financing (NPF)/NPL | 1.36% | 5 | 1.26% | 5 |

Source: Bank NTB Syariah 2020 (processed)

Based on Bank Indonesia Regulation Number 13/1/PBI/2011 that the bank soundness level includes five ratings and each rating is assigned a score of “not healthy” with a score of 1, “less healthy” with a score of 2, “fairly healthy” with a score of 3, “ healthy” with a score of 4, and “very healthy” with a score of 5. Bank NTB Syariah soundness score is shown in table 3. The weighted average score of Bank NTB Syariah financial ratios in 2019 (before the Covid-19 pandemic) was 4.51 and in 2020 (after the Covid-19 pandemic) was 4.11. On the other hand, based on the results of statistical tests, the Mann-Whitney U value obtained was 23.50 at Sign.0.872 (> 0.05) or "not significant" at a significance level of 0.05. The Covid-19 pandemic does not significantly affect the health condition of Bank NTB Syariah where Bank NTB Syariah remains relatively “healthy” before and after the Covid-19 pandemic.

5. Conclusions

In conventional banks, businesses that are less risky are subject to higher interest rates, while businesses that are riskier are subject to lower interest rates as a result of adverse selection where the credit market is filled with high-risk businesses that shift low-risk businesses. With the profit-sharing system in Islamic banks, then the more risky business can no longer be reported as a less

risky business, so the adverse selection issue will not arise. That is, from the theoretical dimension of the problem of asymmetric information, namely adverse selection in conventional banks, it can be overcome by a profit-sharing system in Islamic banks (Abdul *et al.*, 2020; Meslier *et al.*, 2020).

The profit-sharing system (*shirkah*) at Bank NTB Syariah has been implemented in the form of practice as a superior product for productive financing. The productive financing of Bank NTB Syariah is mostly a product of the profit-sharing system (*shirkah*) in skimmed form of *musharakah* with a market share of 64.73 percent in 2019 then increased to 68.55 percent in 2020 with a growth of 35.78 percent. The Covid-19 pandemic does not significantly affect the health condition of Bank NTB Syariah where Bank NTB Syariah remains relatively “healthy” before and after the Covid-19 pandemic.

6. Managerial Implications

The product sharing system implemented by Bank NTB Syariah is still only a skim of *musharakah*, so that in the future it is necessary to develop other skims, namely *mudharabah*. In this study, the performance of Islamic banks is assessed using financial ratios; in the future, it is

necessary to conduct research with other assessment instruments, namely economic value added (EVA).

References

- [1]. Abdul, Z., How, J., Verhoeven, P., & Hassan, M. K. (2020). Asymmetric information and securitization design in Islamic capital markets. *Pacific-Basin Finance Journal*, 62(August 2019), 101189. <https://doi.org/10.1016/j.pacfin.2019.101189>
- [2]. Akerlof G., 1970. *The market for lemons: quality uncertainty and the market mechanism*. Quarterly
- [3]. *Journal of Economic*, 84(3), 488-500.
- [4]. Albaity, M., & Rahman, M. (2019). The intention to use Islamic banking: an exploratory study to measure Islamic financial literacy. *International Journal of Emerging Markets*, 14(5), 988–1012. <https://doi.org/10.1108/IJOEM-05-2018-0218>
- [5]. Askari H., Iqbal Z., Mirakhor A., 2015. *Introduction to Islamic Economic: Theory and Application*. Wiley & Sons Singapore Pte.Ltd, Singapore.
- [6]. Avdasheva, S., & Yakovlev, A. (2010). *Asymmetric Information and the Russian Individual Savings Market*. 1377. <https://doi.org/10.1080/14631370050043625>
- [7]. Banerjee, A.V. and A.Newman, 1993. *Occupational Choice and the Process of Development*. *Journal of Political Economy*, 101, 274-289.
- [8]. Bank NTB Syariah, 2020. *Laporan Tahunan PT.Bank Syariah 2020: Semangat Amanah, Optimisme dan Tumbuh Dalam Berkelanjutan*. PT. Bank NTB Syariah, Mataram.
- [9]. Bakhtiar, T. dan Sugema Imam, 2012. *Masalah Informasi Asimetrik Dalam Sistem Perbankan Syariah: Adverse Selection Problem*. Institut Pertanian Bogor, Bogor.
- [10]. BPS NTB, 2020. *Analisis Isu Terkini: Dampak Covid-19 di Provinsi NTB*. Badan Pusat Statistik Provinsi NTB, Mataram.
- [11]. Chen, Y., Friedman, R., & Tony Simons. (2014). Article Information - Home Article Information - Home. *Managerial Auditing Journal*, 28(2), 2–3.
- [12]. Christie, A. N. (2014). Experiments in Financial Economics Article information : In *Research in Experimental Economics* (Vol. 12). Emerald Group Publishing Limited. [https://doi.org/10.1108/S0193-2306\(2013\)0000016002](https://doi.org/10.1108/S0193-2306(2013)0000016002)
- [13]. Endri dan Wakil, Abdul, 2018. *Analisis Kinerja Keuangan Dengan Menggunakan Rasio-Rasio Keuangan dan Economic Value Added (Studi Kasus: PT. Bank Syariah Mandiri)*. Tazkia: Islamic Finance Review, 113-134.
- [14]. Grassa, R. (2012). *Islamic banks ' income structure and risk : evidence from GCC countries*. 25(3), 227–241. <https://doi.org/10.1108/10309611211290185>
- [15]. Hasan Kabir M. and Lewis Mervyn K., 2007. *Handbook of Islamic Banking*. Edward Edgar Publisihing Limited, Cheltenham, United Kingdom.
- [16]. Herman, L. E., Setiyaningrum, A., & Ferdinand, A. T. (2018). Techno-entrepreneurial relationship marketing to ignite the SMEs marketing performance in Indonesia. In *Quality - Access to Success* (Vol. 19, Issue 167, pp. 98–106).
- [17]. Iqbal, Zamir and Mirakhor A., 2013. *Economic Development and Islamic Finance*. World Bank, Washington, DC.
- [18]. Iqbal Zamir, 2007. *Challenge Facing Islamic Financial Industry*. *Journal of Islamic Economic, Banking, and Finance*.
- [19]. Johan, Z. J., & Putit, L. (2016). Conceptualizing the Influences of Knowledge and Religiosity on Islamic Credit

- Card Compliance. *Procedia Economics and Finance*, 37(16), 480–487. [https://doi.org/10.1016/s2212-5671\(16\)30155-1](https://doi.org/10.1016/s2212-5671(16)30155-1)
- [20]. Khmous, D. F., & Besim, M. (2020). Impact of Islamic banking share on financial inclusion: evidence from MENA. *International Journal of Islamic and Middle Eastern Finance and Management*, 13(4), 655–673. <https://doi.org/10.1108/IMEFM-07-2019-0279>
- [21]. Mbawuni, J., & Nimako, S. G. (2017). Determinants of Islamic banking adoption in Ghana. *International Journal of Islamic and Middle Eastern Finance and Management*, 10(2), 264–288. <https://doi.org/10.1108/IMEFM-04-2016-0056>
- [22]. Mervyn K. Lewis, 2010. *In What ways does Islamic Banking Differ from Conventional Finance*. *Journal of Islamic Economic, Banking, and Finance*, 4(3), 13-25..
- [23]. Meslier, C., Risfandy, T., & Tarazi, A. (2020). Islamic banks' equity financing, Shariah supervisory board, and banking environments. *Pacific-Basin Finance Journal*, 62(May), 101354. <https://doi.org/10.1016/j.pacfin.2020.101354>
- [24]. OJK, 2021. *Statistik Perbankan Syariah 2020*. Departemen Perizinan dan Informasi Perbankan, Otoritas Jasa Keuangan, Februari 2021, Jakarta.
- [25]. Samarskii A.A. and Mikhailov, A.P., 2002. *Principles of Mathematical Modeling: Ideas, Methods, Example*. CRC Press Taylor & Francis Group, New York.
- [26]. Sen, Amartya, 2014. *Economic Methodology: Heterogeneity and Relevance*. *Social Research*, 71(3), 583-614.
- [27]. Stiglitz, Joseph E., 2001. *Information and The Change in The Paradigm in Economics*. Columbia Business School, Columbia University, New York, USA, Prize Lecture, December 8, 2001, 472-540
- [28]. Stiglitz, Joseph E. dan Weiss, Andrew, 1981. *Credit Rationing in Markets with Imperfect Information*. *American Economic Review*, 71(3), 393-410.
- [29]. Stiglitz, Joseph E., 1975. *The Theory of "Screening", Education, and the Distribution of Income*. *American Economic Review*, 65(3), 283-300.
- [30]. Thadden, E. Von. (2004). *Asymmetric information, bank lending and implicit contracts: the winner's curse*. 1, 11–23. [https://doi.org/10.1016/S1544-6123\(03\)00006-0](https://doi.org/10.1016/S1544-6123(03)00006-0)
- [31]. Xue, W., & Zhang, L. (2019). The Journal of Economic Asymmetries Revisiting the asymmetric effects of bank credit on the business cycle: A panel quantile regression approach. *The Journal of Economic Asymmetries*, 20(May), e00122. <https://doi.org/10.1016/j.jeca.2019.e00122>

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

The authors equally contributed in the present research, at all stages from the formulation of the problem to the final findings and solution.

Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself

No funding was received for conducting this study.

Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

Creative Commons Attribution License 4.0 (Attribution 4.0 International, CC BY 4.0)

This article is published under the terms of the Creative Commons Attribution License 4.0

https://creativecommons.org/licenses/by/4.0/deed.en_US