

# Do Technology Changes Affect The Productivity of The Indonesian Islamic Rural Bank (BPRS)?

Aam Slamet Rusydiana<sup>1</sup>, Aisyah As-Salafiyah<sup>2</sup>

<sup>1,2</sup> Sharia Economics Applied Research and Training (SMART), Indonesia

The Islamic financial industry in Indonesia is currently a global concern, one of which is bank financial institutions, so measuring productivity is essential for Islamic rural banks (BPRS) in Indonesia. This study tries to analyze the BCC model as a basic model to see the level of productivity in a BPRS using the Malmquist productivity index, both in terms of changes in efficiency and changes in technology. The results obtained from the Malmquist index score or total productivity change (TFPCH) show that, in general, BPRS has experienced a decline in productivity but has increased in the last two years. However, there are six BPRS out of 16 BPRS that get an average score of more than one and show an increase in productivity. The BPRS with the highest productivity level score is PT BPD East Kalimantan and North Kalimantan, and the BPRS with the lowest productivity level score is PT BPD Central Java (UUS). However, East Java still has not reached the optimal level of productivity, with a score of 0.803. Overall, the priority factor that needs to be improved in BPRS is the rate of change in technological innovation. This research shows that BPRS needs to implement digitalization.

**Keywords: BPRS; Productivity; Technology; Digitization**

## OPEN ACCESS

\*Correspondence:  
Aam Slamet Rusydiana  
aamsmart@gmail.com

Received: 29 October 2022  
Accepted: 4 November 2022  
Published: 29 November 2022

Citation:  
(2022) Do Technology Changes Affect  
The Productivity of The Indonesian  
Islamic Rural Bank (BPRS)?  
Tamkin Journal. 1.1.

## INTRODUCTION

Islamic Rural Banks, or Bank Pembiayaan Rakyat Syariah (BPRS), offer similar financial services to Islamic commercial banks, except that BPRs are not permitted to handle payment flow, such as clearing. BPRS may be owned only by Indonesian residents and legal entities, regional governments, or joint ventures between Indonesian citizens or legal entities and local governments (Fatimatuzahra, 2016; Wardiwiyo, 2020).

In a report published in September 2021, the Financial Services Authority (OJK) stated that the total number of BPR (rural bank) and BPRS (Islamic rural bank) in Indonesia had reached 1,646 units. This number was derived from 1,481 BPR and 165 BPRS. Islamic banking institutions have consulted the National Sharia Council (DSN) fatwa before providing a service product in the recent decade. The DSN MUI fatwa serves as a guideline for Islamic banking in Indonesia, ensuring that the principles of Islamic sharia are followed to maintain sharia conformity with the principles of Islamic sharia (Hadi, 2019; Marlina et al., 2021; Rusydiana & Firmansyah, 2018).

While interest in the BPRS is increasing, multiple studies indicate that it is still less efficient than a traditional rural bank. It is empirically related to the performance of still-developing BPRS. While there is little competition between conventional and Islamic rural banks, BPRS have a place in society. As a result, research on the BPRS sector's productivity has become a significant banking literature component. Apart from that, examining the banking sector's productivity shifts should interest bankers and policymakers. A rise in productivity is anticipated to be a positive indicator of banks' ability to manage their resources more efficiently, lower their pricing, and improve the quality of their services.

Productivity discussions in a given business entail the efficient utilization and integration of existing resources. This stage is necessary for the company's growth and development and the internalization of numerous subsystem upgrades. Productivity refers to the most efficient use of a business's resources to accomplish effective and efficient goals within the agreed-upon value framework. The Malmquist Index is a unique measure of productivity since it enables researchers to decompose the index of productivity change into components, thereby elucidating the reasons for either productivity increase or loss. This method is a comprehensive instrument for analyzing the performance of a sector whose operational activities

involve many inputs and outputs (Mohd Salleh & Rani, 2020).

BPRS development must be accompanied by a productivity analysis that quantifies the banking industry's output growth. Productivity is measured in this study using Total Factor Productivity (TFP) by not partially distinguishing production factors. TFP is significant in and of itself since it is a measure of productivity that incorporates all critical aspects of production. Additionally, there is a dearth of literature on banking productivity in developing nations. Additionally, this disparity prompts additional research on assessing the productivity performance of BPRS with BPR, particularly in developing countries such as Indonesia.

## LITERATURE REVIEW

According to the Financial Services Authority (OJK), rural banks (BPRs) are banks that operate traditionally or according to sharia principles but do not provide payment services. BPR activities are significantly restricted compared to general bank activities, as BPRs are not permitted to accept demand deposits, foreign exchange transactions, or insurance. Meanwhile, a BPRS is a bank that operates according to sharia principles and does not engage in payment traffic.

The legal framework for establishing Sharia Rural Banks is laid out in Law No. 7 of 1992 on Banking and Government Regulation (PP) No. 27 of 1992 on Profit Sharing Banks. However, following a revision in Sharia Rural Banks' law, Law Number 10 of 1998 was enacted. Islamic Rural Banks do business under sharia principles, as specified in the Decree of the Director of Bank Indonesia No. 32/36/KEP/DIR/1999 dated 12 May 1999 concerning Islamic Rural Banks (Bank Perkreditan Rakyat Berdasarkan Prinsip Syariah) (Sutisna et al., 2021).

Several studies attempted to design a plan for BPRS's business development loans to SMEs. They seek to ascertain internal (strengths and weaknesses) and external (opportunities and threats) variables, establish a development strategy based on external and internal factors, and prioritize the BPRS development strategy (Rusydiana & Devi, 2013).

Their findings indicated that the primary strength of BPRS is its customer-centric positioning and strategy, while the primary weakness is its limited human resource quality. At the same time, potential market opportunities are Muslims enrolled in boarding schools (pesantren), and the immediate threat to BPRS is an overabundance of competitors in small and medium businesses. Thus,

strategic position, market potential, human resource quality, and the number of competitors all play a role in the development of BPRS. Additionally, this can be connected to BMT, a component of microfinance organizations. Thus, the development of BMT is controlled by four factors that must be taken into account and addressed (Pratiwi, 2016).

Additionally, BPRS may provide finance to microbusinesses, thereby increasing their capital. However, this promise cannot be fully realized because BPRS continue to confront numerous restrictions, including overlapping institutional features, a lack of management resources, and a shortage of capital in Microfinance Institutions. The researcher proposed solutions to institutional efforts to reinforce the Microfinance Institutions Act and the government's commitment to linking small and medium-sized businesses to microfinance institution development (Andriyani et al., 2020).

## METHODOLOGY

Sten Malmquist first created the Malmquist index in 1953 to measure productivity. But in its development, the Malmquist Index was introduced by Caves et al. (1982). Two things are calculated in the Malmquist index measurement: the catch-up and the frontier shift effect. The catch-up effect measures the rate of change in relative efficiency from period 1 to period 2. Meanwhile, the frontier shift effect measures the rate of technological change, a combination of inputs and outputs from period 1 to period 2. The frontier shift effect is often referred to as the innovation effect (Caves et al., 1982; Rani et al., 2017; Rusydiana, 2018).

The Malmquist index has several favourable characteristics. First, this index is a non-parametric method, so it does not require the specification of the production function. Second, the Malmquist index does not require assumptions about the behaviour of economic production units, such as cost minimization or profit maximization. So it is helpful if the destination is a different manufacturer or unknown. Third, the calculation of this index does not require price data which is often not available. Fourth, the Malmquist productivity index can be divided into two components: changes in efficiency and changes in technology (Marlina et al., 2018).

The study was conducted on 16 samples of BPRS in Indonesia during the period 2013 to 2020. The variables used were fixed assets, labour costs, third party funds, and paid-in capital as for the output variables used, namely the amount of financing provided and

operating income. The analytical tools used in this study to measure the Malmquist productivity index are using DEAP 2.1 software. BPRS productivity calculation is carried out using the BCC or VRS approach with an output orientation.

**Table 1:** Input and Output Grouping

No.	Input	Output
1	Fixed assets	Amount of Financing Granted
2	Labor Load	Operating Income
3	Third-party funds	
4	Paid-up capital	

In this study, the estimated growth of TFP and its components refers to the Malmquist Index and uses the Cobb-Douglas production function. The Cobb-Douglas production function can be written as follows:

$$Y = A * L^a * K^{(1-a)} \quad (4)$$

The equation is expressed as a measure of the total factor productivity, where scalar A has economic value. The input's geometric weighted average (geometric weighted average) is used to produce the actual output. Thus, A can be interpreted as real output per unit of input. This is a better productivity measure than Y/L and Y/K, which are partial productivity measures that do not consider the possible number of other inputs used. Then, the method used to measure efficiency in this research is part of the Data Envelopment Analysis (DEA), namely the Malmquist Productivity Index (MPI).

## RESULT AND DISCUSSION

Factors of change in productivity can be seen through the value of the Efficiency Change Index (EFFCH) and Technology Change Index (TECHCH) to explain the change in productivity. Meanwhile, the Pure Efficiency Change Index (PECH) and Scale Efficiency Change Index (ECH) are used to determine the cause of changes in the efficiency change index (EFFCH). The value of Total Factor Production (TFP) shows a change in the index. If the value of M>1 indicates an increase in productivity, M=1 indicates no increase in productivity, and M<1 shows a decrease in the value of productivity at the bank.

Table 1 below describes the results of the estimated Malmquist Productivity Index (MPI) values of BPRS in Indonesia, which are included in the object of observation.

**Table 2:** Malmquist Index score per year

Year	Effch	Techch	Pech	Sech	Tfpch
2013-2014	0.862	0.831	0.929	0.927	0.716
2014-2015	1.090	0.284	1.032	1.056	0.309
2015-2016	0.606	1.519	0.760	0.797	0.920
2016-2017	1.560	1.237	1.277	1.222	1.931
2017-2018	0.911	0.914	0.877	1.038	0.833
2018-2019	1.227	1.081	1.214	1.010	1.326
2019-2020	0.944	1.229	0.963	0.981	1.161
<b>Mean</b>	<b>0.991</b>	<b>0.915</b>	<b>0.993</b>	<b>0.997</b>	<b>0.907</b>

The table above shows that there has been an increase in productivity levels in the last two years as indicated by the total factor productivity changes (TFPCH), which increased from the unproductive value below 1, namely 0.833 in 2017-2018, even though the previous year was 2016-2018. 2017 experienced the highest productive condition with a score of 1,931. Then in 2018-2019, it increased to 1,326 and in 2019-2020 by 1,161. Despite the decline, they are still in a productive condition with a score above 1. The increase in TFPCH experienced by BPRS in Indonesia is influenced by the

level of change in efficiency (EFFCH score) and technological change (TECHCH score).

In the results above, in the last period, namely 2019-2020, the EFFCH value was 0.944, which indicated it was not productive and decreased from the previous year, while the TECHCH value was 1,229, which indicated that it was productive and increased from the last year. As for the average score, EFFCH achieved a higher average score with 0.991 compared to TECHCH with 0.915. Meanwhile, the average score of all BPRS is 0.907, which means it is not productive.

Based on the analysis of two factors, namely efficiency and productivity above, the average condition of being unproductive but increasing in the last two years is generally due to the low level of innovation in technology (TECHCH). However, technological changes have continued to grow over the previous two years. On the other hand, the higher EFFCH value, although not at the productive level, contributed more to the TFPCH value.

This research was conducted by measuring the productivity levels in each BPRS in Indonesia in the 2013-2020 period. The calculation results seen from the average of each BPRS can be seen in Table 3 below.

**Table 3:** Malmquist Index Score per bank

DMU	Effch	Techch	Pech	Sech	Tfpch
PT Bank Aceh Syariah	1.009	0.895	1.009	1.000	0.903
PT BPD Nusa Tenggara Barat Syariah	1.000	0.834	1.000	1.000	0.834
PT Bank Jabar Banten Syariah	0.998	0.767	0.997	1.002	0.765
PT BPD DKI (UUS)	0.975	0.777	0.976	0.999	0.757
PT BPD Daerah Istimewa Yogyakarta (UUS)	0.971	0.794	0.971	1.000	0.771
PT BPD Jawa Tengah (UUS)	0.948	0.786	0.949	0.999	0.745
PT BPD Jawa Timur (UUS)	0.994	0.808	0.995	1.000	0.803
PT BPD Sumatera Utara (UUS)	1.000	0.808	1.000	1.000	0.808
PT BPD Jambi (UUS)	0.999	0.980	1.000	0.999	0.979
PT BPD Sumatera Barat (UUS)	1.000	0.989	1.000	1.000	0.989
PT BPD Riau dan Kepulauan Riau	1.000	1.034	1.000	1.000	1.034
PT BPD Sumatera Selatan dan Bangka Belitung	0.965	1.039	1.000	0.965	1.002
PT BPD Kalimantan Selatan	0.988	1.011	1.000	0.988	1.000
PT BPD Kalimantan Barat	1.000	1.095	1.000	1.000	1.095
PT BPD Kalimantan Timur dan Kalimantan Utara	1.004	1.128	1.002	1.003	1.133
PT BPD Sulawesi Selatan dan Sulawesi Barat	1.000	1.032	1.000	1.000	1.032
<b>Mean</b>	<b>0.991</b>	<b>0.915</b>	<b>0.993</b>	<b>0.997</b>	<b>0.907</b>

Based on Table 3, overall, BPRS in Indonesia has a productivity level that is not yet optimal, with a total average of 0.907. The most productive BPRS among

other BPRS are PT BPD East Kalimantan and North Kalimantan, with a TFPCH value of 1,133, indicating productivity. The bank's EFFCH value is also

productive with a value of 1,004 and the TECHCH value with a score above one, to be exact 1,128. So it can be concluded that one of the factors that affect the high level of productivity at PT BPD Kalimantan Timur and North Kalimantan is the high level of technological innovation (TECHCH), followed by the level of efficiency, which is also productive.

In addition to PT BPD Kalimantan Timur and Kalimantan Utara, there are also five BPRS with a score of more than one, indicating that they are productive, namely PT BPD Riau and Riau Islands with a score of 1,034, PT BPD Sumatra Selatan and Bangka Belitung with a value of 1,002, PT BPD Kalimantan Selatan with a value of 1,000, PT BPD West Kalimantan with a value of 1,095 and PT BPD South Sulawesi and West Sulawesi with a value of 1,032.

The BPRS with the lowest TFPCH value compared to the other BPRS sampled in this study is PT BPD Jawa Tengah (UUS), acquiring a productivity level (TFPCH) of 0.745. PT BPD Jawa Tengah (UUS) has the lowest efficiency change rate among other BPRS at 0.948. Meanwhile, the level of technological innovation owned by PT BPD Jawa Tengah (UUS) is 0.786. Although the value is lower, it is not the BPRS with the lowest TFPCH score. Based on these results, the factors that cause the low level of productivity at PT BPD Jawa Tengah (UUS) are the low level of efficiency change and technological innovation.

As for the PT BPD East Java (UUS) specifically, the BPRS received a TFPCH score of 0.803. The score for the change in efficiency is 0.994, which is close to the productive value of 1 and the technological innovation score is 0.808. This shows that the East Java BPRS still needs to improve its technological innovation as a top priority, only increasing the level of efficiency change.

At the end of 2021, the Financial Services Authority's (OJK) Regional Office 4 East Java noted that credit or financing for the rural bank (BPR) industry in the region, including sharia-compliant rural bank (BPRS), increased 3.46 per cent year on year, or faster than the East Java and national banking industries. This rise resulted from the economic recovery process in East Java, which included the position in October 2021 that the BPR and BPRS industries in East Java restructured debts totalling IDR 1.3 trillion, or 1.8 per cent of total banking restructuring in East Java.

This was facilitated by the ongoing restructuring stimulus provided by COVID-19, as the gross NPL/NPF ratio of BPR/BPRS reduced from 9.45 per cent in October 2020 to 9.19 per cent in October 2021. Meanwhile, to combat deterioration in credit or

financing quality, OJK has directed BPRs and BPRS to tighten their internal controls, mainly through improved risk management and higher capital.

## FINDINGS

In Indonesia, there are several types of microfinance institutions. One of them is Islamic Rural Bank (BPRS). Unlike others, a cooperative with limited government engagement and backing, the BPRS is a bank regulated by the Indonesian Central Bank (Bank Indonesia). When comparing the borrower's status before and after funding, the BPRS type of institutions is related to an improvement in the borrowers' economic variables, although the BPRS had a more substantial influence on micro-enterprises than other microfinance institutions, possibly because of their larger size and the central bank of Indonesia's backing and oversight (Hossain, 2019; Sulaiman & Zakari, 2015).

Based on the research results using the Malmquist Productivity Index above, the results show the productivity of BPRS in Indonesia. The total number of BPRS studied was 16 BPRS from 2013 to 2020. Based on this data, the most priority aspect to be improved by BPRS is to increase productivity in technological innovation. By taking advantage of the potential for swift technological developments, BPRS can compensate by starting to digitize. BPRS needs to use digital technology and digitized data to influence how all work is completed, change the way banks interact with customers, and create new revenue streams (digitally) (Norafni et al., 2020).

There must be a digital transformation in the BPRS industry. Over the past few years, there has been a massive increase in the demand for digital acceleration. This is because people have changed their expectations for fast, efficient, and secure financial services that can be done anywhere. BPRS need to make digital transformation a top priority and one of their strategies to make their BPRS more competitive (Bahrini, 2015; Rani et al., 2020).

SRBs must change how they manage and operate their business due to digital transformation. People are moving away from traditional financial institutions and towards the more accessible financial institutions of the future. This has made financial institutions change their business strategies, reorganize their distribution networks, and encourage banking transactions through digital channels (mobile apps and the internet). Including the use of the latest electronic banking tools to improve customer service (Al-Muharrami, 2007; Barneveld et al., 2020).

Therefore, the development of BPRS must be focused on various effective strategies to accelerate its digitalization. However, the digitalization of BPRS presents new problems that BPRS needs to be aware of to deal with, such as sharia compliance. Along with the growth of the BPRS, it is also necessary to make various efforts to deal with the multiple problems that the BPRS will face in the digital era. Islam can benefit a lot from the rise of digital technology, but it must also pay attention to the principle of prudence. That way, the country's economy will not be affected by changes in the financial sector (Alexakis et al., 2019; Asad et al., 2018; Nugrohowati et al., 2020).

Since the Covid-19 pandemic, particularly in Indonesia, BPRS has been forced to rethink its strategy. The BPRS has lowered risk by carefully identifying clients eligible for loan restructuring. Then they could determine which clients are qualified for restructuring and which are not. Additionally, BPRS continues to expand and focuses on industries that may still have a future in the event of a pandemic. After all, this BPRS continues to repay depositors. Additionally, BPRS must exercise caution in selecting business areas that can survive and grow.

BPRS should prioritize the development of digital and online banking. Since the pandemic conditions, numerous digital and online banking services have been implemented, and BPRS must follow suit. Additionally, BPRS can support its customers, particularly MSMEs. Customers must be assisted to continue operating their businesses. Thus, the buyer will be able to meet his responsibilities.

Additionally, BPRS must engage in digital marketing. The current circumstances, which require all meetings to be conducted digitally, must be used as an opportunity to sell. Additionally, BPRS leaders must maintain an agile leadership style, continuously grow, and be adaptable to change and change. In addressing the crisis's challenges, which have resulted in uncertain conditions, the company is currently relying on a positive response and analyzing changes in the market/behaviour of competitors and customers, as well as planning for the preventive side and developing a strategy for the post-Covid-19 economic recovery condition.

## CONCLUSION

This study tries to analyze the BCC or VRS model as the basic model in the DEA to see the productivity level of BPRS in Indonesia using the Malmquist index. The Malmquist Productivity Index is used to know the

productivity level of a BPRS, both in terms of changes in efficiency and changes in technology.

The results obtained from the Malmquist index score show that all the BPRS observed, namely 16 BPRS, have experienced a general decline in productivity. However, it has increased explicitly in the last two years, namely the period 2018-2019 and 2019-2020 and reached a productivity level with a score above one. The average score of changes in total factor productivity (TFPCH) is less than one.

This is influenced, among other things, by the low technological change (TECHCH) in BPRS of 0.915, as well as changes in the efficiency of BPRS in Indonesia, which tend to be better even though it has not yet reached the productive level, where the change in efficiency (EFFCH) obtained is 0.991. This means that the productivity level of BPRS in Indonesia can be increased by prioritizing improving technological changes and implementing digitalization in BPRS, then only increasing efficiency changes.

## RECOMMENDATION

Suggestions for practitioners are that they must improve the quality of innovation and use of technology and bring up BPRS digital products so that customers have more convenience. The BPRS itself will become more efficient and get a better productivity score. Academics must continue to update information and data on BPRS productivity, especially in the years ahead during the post-pandemic economic recovery period. Through further research, the researchers are expected to find ways to increase productivity with updates that are appropriate to the situation. Suggestions for regulators are the need for technological and digitalization regulatory support for BPRS to improve their quality and productivity. In the future, consideration should also be given to measuring the social performance of BPRS in Indonesia (Rusydziana & Marlina, 2019; Rusydziana, 2019).

## REFERENCES

- Al-Muharrami, S. (2007). The causes of productivity change in GCC banking industry. *International Journal of Productivity and Performance Management*, 56(8), 731–743. <https://doi.org/10.1108/17410400710833029>
- Alexakis, C., Izzeldin, M., Johnes, J., & Pappas, V. (2019). Performance and productivity in Islamic and conventional banks: Evidence from the global financial crisis. *Economic Modelling*, 79, 1–14.

- <https://doi.org/10.1016/j.econmod.2018.09.030>
- Andriyani, L., Usman, N., & Pambuko, Z. B. (2020). Antecedents of social funds' productivity of Islamic Banks in Indonesia. *Humanities and Social Sciences Reviews*, 8(2), 488–494. <https://doi.org/10.18510/hssr.2020.8256>
- Asad, M., Hussain Haider, S., Salman Badan Meteorologi Klimatologi dan Geofisika, R., Ahmad, I., & Salman Assistant Professor, R. (2018). A critical review of Islamic and conventional banking in digital era: A case of Pakistan Techno-entrepreneur Intentions View project Corporate Governance View project A Critical Review of Islamic and Conventional Banking in Digital Era: A Case of Pakistan. *International Journal of Engineering & Technology*, 7(7), 57–59. <https://doi.org/10.14419/ijet.v7i4.7.20382>
- Bahrini, R. (2015). Productivity of MENA Islamic banks: a bootstrapped Malmquist index approach. *International Journal of Islamic and Middle Eastern Finance and Management*, 8(4), 508–528. <https://doi.org/10.1108/IMEFM-11-2014-0114>
- Barneveld, K. Van, Quinlan, M., Kriesler, P., Junor, A., Baum, F., Chowdhury, A., Junankar, P. (Raja), Clibborn, S., Flanagan, F., Wright, C. F., Friel, S., Halevi, J., & Rannie, A. (2020). The COVID-19 pandemic: Lessons on building more equal and sustainable societies. *The Economic and Labour Relations Review*, 31(2), 133–157. <https://doi.org/10.1177/1035304620927107>
- Caves, D. W., Christensen, L. R., & Diewert, W. E. (1982). The economic theory of index numbers and the measurement of input, output, and productivity. *Econometrica: Journal of the Econometric Society*, 50(6), 1393–1414.
- Fatimatuzahra, I. R. (2016). Analisis Kinerja Perbankan Syariah Indonesia Ditinjau dari Maqashid Sharia: Pendekatan Maqashid Sharia Index. In *Universitas Islam Indonesia*. Universitas Islam Indonesia.
- Hadi, E. A. (2019). Fatwa DSN MUI dan Perkembangan Produk Perbankan Syariah Di Indonesia. *An-Nisbah: Jurnal Ekonomi Syariah*, 05(April), 82–105.
- Hossain, B. (2019). Islamic Microfinance and Rehabilitation Model for the Slum and Floating Population by Waqf Funds, the Case of Bangladesh: A Proposal for Muslim Countries. *JKAU: Islamic Econ.*, 32(2), 139–160. <https://doi.org/10.4197/Islec>
- Marlina, L., Rusydiana, A. S., & Athoillah, M. A. (2018). Malmquist Index To Measure The Efficiency and Productivity of Indonesia Islamic Banks. *Pridobljeno*, 20(7).
- Marlina, L., Rusydiana, A. S., Hidayat, P., & Firdaus, N. (2021). Twenty Years of Islamic Banking in Indonesia: a Biblioshiny Application. *Library Philosophy and Practice (e-Journal)*, 2021, 1–22.
- Mohd Salleh, M. C., & Rani, L. N. (2020). Productivity Comparison of Islamic and Conventional Banks in Indonesia. *Al-Uqud: Journal of Islamic Economics*, 4(1), 69. <https://doi.org/10.26740/al-uqud.v4n1.p69-82>
- Norafni, Rahim, F., Bakri, M. H., & Yahaya, S. N. (2020). Conceptualization of Spiritual Intelligence Quotient (SQ) in the Islamic Fintech Adoption. *Islamiyyat*, 42(1), 113–122. <https://doi.org/10.17576/islamiyyat-2020-4201-13>
- Nugrohowati, R. N. I., Fakhrunnas, F., & Haron, R. (2020). Examining Technological and Productivity Change in the Islamic Banking Industry. *Pertanika Journal of Social Sciences and Humanities*, 28(4), 3355–3374. <https://doi.org/10.47836/pjssh.28.4.47>
- Pratiwi, A. (2016). Islamic banking contribution in sustainable socioeconomic development in Indonesia: An epistemological approach. *Humanomics*, 32(2), 98–120. <https://doi.org/10.1108/H-12-2015-0085>
- Rani, L. N., Rusydiana, A. S., & Widiastuti, T. (2017). Comparative Analysis of Islamic Bank's Productivity and Conventional Bank's in Indonesia Period 2008-2016. *1st International Conference on Islamic Economics, Business, and Philanthropy (ICIEBP 2017)*, 118–123.
- Rani, L. N., Sukmaningrum, P. S., & Salleh, M. C. M. (2020). A comparative analysis of the productivity of Islamic banking in Indonesia, Malaysia and Brunei Darussalam during the period 2012-2017. *International Journal of Innovation, Creativity and Change*, 11(11), 470–491.
- Rusydiana, A. S. (2018). Indeks Malmquist untuk Pengukuran Efisiensi dan Produktivitas Bank Syariah di Indonesia. *Jurnal Ekonomi Pembangunan*, 26(1), 47–58. <https://doi.org/10.14203/jep.26.1.2018.47-58>
- Rusydiana, A. S. (2019). Efisiensi sosial dan finansial bank syariah di Indonesia: Pendekatan nonparametrik. *Riset Akuntansi dan Keuangan Indonesia*, 4(1), 13-24.
- Rusydiana, A. S., & Devi, A. (2013). Challenges in developing Baitul Maal wat Tamwil (BMT) in Indonesia using Analytic Network Process (ANP).

- Business and Management Quarterly Review (BMQR)*, 4(1), 51–62.
- Rusydiana, A. S., & Marlina, L. (2019). Financial and social efficiency on Indonesian Islamic banks. *Journal of Islamic Monetary Economics and Finance*, 5(3), 579-602.
- Rusydiana, A. S., & Firmansyah, I. (2018). Efficiency versus Maqashid Sharia Index: an Application on Indonesian Islamic Bank. *Shirkah: Journal of Economics and Business*, 2(2). <https://doi.org/10.22515/shirkah.v2i2.154>
- Sulaiman, M., & Zakari, M. A. (2015). Efficiency and effectiveness of waqf institutions in Malaysia: Toward financial sustainability. In *Access to Finance and Human Development — Essays on Zakah, Anqaf and microfinance* (Vol. 1).
- Sutisna, Hasanah, N., Dewi, A. P., Nugraha, I., Katmas, E., Mutakin, A., Nurhadi, Suparnyo, Arsyad, K., Triyawan, A., & Misno, A. (2021). Panorama Maqashid Syariah. In *CV. Media Sains Indonesia*.
- Wardiwyono, S. (2020). Six Years in Achieving Maqasid Ash-Shariah: The Case of Islamic Commercial Banks in Indonesia. *Proceedings of the 1st International Conference on Science, Health, Economics, Education and Technology*, 27(ICoSHEET 2019), 20–24. <https://doi.org/10.2991/ahsr.k.200723.005>