



Do Financial Access, Digitalization Adoption, Innovation, and Market Orientation Influence Business Performance of Micro-Small Enterprises?

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Abstract. *The improvement of performance for Micro and Small Enterprises (MSEs) is a must to achieve business performance growth. To achieve business performance successfully, the MSEs partly need to investigate factors that influence it. This study aims to examine whether or not financial access, digitalization adoption, product innovation, and market orientation influence MSEs' business performance. The source of data was obtained by distributing questionnaires to 135 women who engaged in MSEs in Belitung Regency as one of the main locations of women MSEs in Indonesia. These data were then analyzed statistically by applying the Partial Least Square-Structural Equation Modeling (PLS-SEM). The main findings of this research are: (i) the path coefficient of the variables financial access, product innovation, and market orientation has a positive and significant effect, (ii) the path coefficient of digitalization adoption has a positive but not significant effect on MSE business performance. The results of this research provide input for women's MSEs in Belitung Regency to be able to improve their market orientation to overcome marketing obstacles that may be experienced and to improve the business performance of women's MSEs in Belitung Regency.*

Keywords: *digitalization adoption, financial access, product innovation, MSE performance, market orientation.*

INTRODUCTION

Through the Analysis of Advanced SE2016 Results, Potential for Improving the Performance of Indonesian Micro and Small Enterprises (BPS, 2019), data obtained shows that MSEs still dominate the business world, with 26 million businesses or 98.68 percent of the total non-agricultural businesses which are able to absorb 73.33 percent of the total non-agricultural businesses. However, apart from their advantages in absorbing labor, MSEs have other limitations, such as problems with access to finance, marketing, human resources, and technological limitations. Efforts to improve the performance of MSEs in Indonesia related to the development of MSMEs in order to strengthen the resilience and revival of the national economy include strategies for expanding financial access and literacy, as well as increasing access to financing. (Bank Indonesia, 2024). The strategy implemented by Bank Indonesia shows one of the efforts to develop MSEs, especially related to the issue of financial access.

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Apart from that, efforts are also made to develop the transformation of MSMEs to make them ascend in class.

This research focuses on MSEs, where almost 98 percent of all the MSMEs in Indonesia were dominated by Micro Enterprises in 2018, so that the obstacles faced by MSMEs are also the obstacles faced by Micro Enterprises (Tambunan, 2021). The improvement of MSEs performance carried out by business actors and policy makers not only can be done by encouraging factors that play a role in business performance, but also as an effort to overcome the limitations or obstacles faced by MSEs.

Micro and Small Enterprises in the industrial sector, as per BPS data on Micro and Small industrial Enterprises, are mostly located in Central Java Province, amounting to 892,108 businesses (BPS, 2023). Even though Central Java dominates, government of Belitung Regency, part of the Bangka Belitung Islands Province, encourages micro and small industrial businesses through various activities for MSEs, such as various training, meetings, exhibitions and competitions for MSEs. Based on BPS data (2023), around 44.07 percent of MSEs in the industrial sector (as micro and small industries, or IMK) are recorded as being managed single-handedly, where the business owner is also the only worker, dominated by women accounted to 70.26 percent. Furthermore, business performance research was conducted on MSEs owned by women (here in after referred to as women's MSEs) in Belitung Regency.

The problem of obstacles towards performance in the form of access to finance, marketing, human resources, technological limitations in MSEs in Indonesia, are not much different from the problems experienced by other countries. For example, obstacles to access to finance, especially for MSEs in India in Biswas (2014) research, limited capital is due to difficulty in accessing finance from banks in China (Nguyen, 2017). Limited financial access from MSE owners sides, including the absence of assets as collateral and limited financial reports, as is the case with MSEs in Indonesia (Tambunan, 2018).

Previous research on the influence of financial access on business performance has a positive and significant effect (Agyemang & Ansong, 2016; Turyakira et al., 2019; Prijadi et al., 2020; Khan et al., 2022; Jha & Alam, 2022). This is possible because funding is very necessary for MSEs to improve their business performance, so financial access is very important for MSE activities, even though financial access is an obstacle for MSEs in various countries. Therefore, for MSEs and policy makers to be able to encourage MSEs improve their business performance, it is necessary to re-examine the influence of financial access on business performance.

Innovation is a necessary factor for business activities in an effort to improve performance, either through product, process or organizational innovation. Byukusenge et al. (2021) research shows the business performance and failure of SMEs in Rwanda. Product innovation is a form of innovation that plays a more important role in business performance compared to process and organizational innovation (Le et al., 2023; Na & Kang, 2019). Several studies on the influence of innovation towards business performance have obtained positive and significant results (Lee & Falahat, 2019; Herman et al., 2018; Khan et al., 2022; Agyapong et al., 2018). However on Issau et al. (2021) research, the result obtained was that product innovation had a positive but not significant effect on business performance.

Apart from the innovative actions required by business owners, market orientation is one of the factors that contributes to business performance (Buli, 2017; Herman et al., 2018; Lekmat et al., 2018; Kolbe et al., 2022; Khan & Bashir, 2020). In several of these studies, results were obtained that there was a positive and significant influence of market orientation on business performance.

The era of digitalization 4.0 with the ease of information and communication technology helps businesses in relation to communication with customers, with distributors or changing the way they promote and sell products (Tambunan, 2021). In reality, MSEs still experience limitations in the use of technology, which becomes an obstacle in efforts to improve their business performance. This research will examine the effect of digitalization adoption on business performance, where most of the digitalization adoption research is related to digitalization adoption intentions, while studies on the influence of digitalization on business performance are still limited. Research on digitalization adoption on business performance carried out by Chen & Kim (2023) obtain positive and significant influence, while other studies obtained positive but not significant results (Lee & Falahat, 2019).

Based on several obstacles faced by MSEs in Indonesia, as well as MSEs in Belitung Regency, while it is necessary to improve the performance of MSEs so that their contribution to the economy is greater, this research will examine several factors related to several obstacles through financial access, adoption of digitalization, innovation product and market orientation on the performance of women's MSEs in Belitung Regency. Apart from that, different results are still obtained regarding the influence of digitalization adoption in the digitalization era. It is interesting to test the effect of digitalization adoption on business performance.

LITERATURE REVIEW

Empirical Review and Hypothesis Development

Financial access and business performance

Turyakira et al. (2019) research with a sample of 384 SMEs in Kampala, Uganda, to see the effect of financial access on business performance, the results showed that financial access had a positive and significant effect on business performance. Same results were obtained in the research carried out by Khan et al. (2022) on 294 manufacturing companies in Pakistan. Furthermore, the hypothesis of this research is as follows.

H1 : Financial access has a positive effect on the business performance of women's MSEs in Belitung Regency.

Digitalization adoption and business performance

Several studies on digitalization adoption on performance are the basis for the hypothesis in this research. Chen dan Kim (2023), in research with a sample of 16,519 companies through the China Stock Market and Accounting Research Database (CSMAR), the adoption of digitalization has a positive and significant effect on business performance, the same results were obtained in the research of Shah et al. (2024), on 396 companies in Pakistan. Meanwhile, research by Lee dan Falahat (2019), on 143 SMEs in Malaysia, the adoption of digitalization had a positive but not significant effect. Furthermore, the hypothesis of this research is as follows.

H2 : The adoption of digitalization has a positive effect on the performance of women's MSEs in Belitung Regency.

Product innovation and business performance

Le et al. (2023) research on a survey of 2500 manufacturing SMEs in Vietnam, obtain result of product innovation play an important role in improving business performance in Vietnam. Research on 153 SMEs in Batam, Indonesia (Herman et al., 2018), product innovation has a positive and significant effect on business performance. Furthermore, the hypothesis of this research is as follows.

H3 : Product innovation has a positive effect on the business performance of women's MSEs in Belitung Regency.

Market orientation and business performance

Research on 171 SME owners in Ethiopia (Buli, 2017), show that market orientation has a positive and significant effect on business performance. The same results were obtained in the research of Lekmat et al. (2018) on 405 SMEs in the service and retail sectors in Thailand. Meanwhile research by Ali et al. (2020), In research conducted on 393 SMEs in the Kingdom

of Saudi Arabia, market orientation had a positive but not significant effect on business performance.

Furthermore, the hypothesis of this research is as follows.

H4 : Market orientation has a positive effect on the business performance of women's MSEs in Belitung Regency.

Based on several studies as the basis for this hypothesis, the research model can be seen in the following picture.

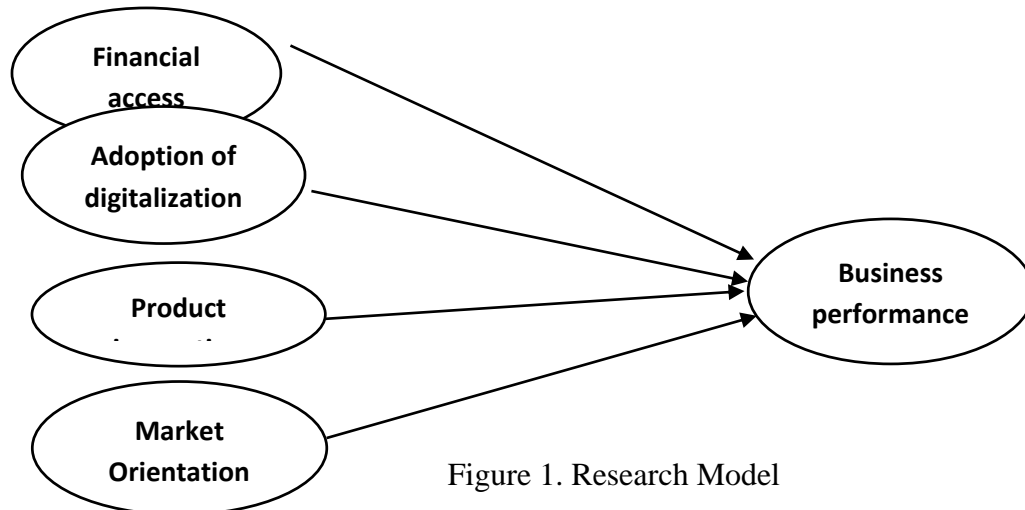


Figure 1. Research Model

RESEARCH METHODS

This research uses a quantitative research model, with a survey questionnaire to collect data. Respondents were selected using purposive sampling, where the respondents in this study were MSEs owned by women in Belitung Regency who are engaged in the processing industry sector and had been active for at least 1.5 years. The number of samples in this study was 135. The questions in the questionnaire are based on indicators from the variables financial access, digitalization adoption, product innovation, market orientation and business performance adopted from previous research (Azam, 2015; Karabulut, 2015; Lu & Zhang, 2016; Buli, 2017; Agyapong et al., 2018; Prijadi, 2020; Issau et al., 2021). The indicators for each variable are measured using a Likert scale with a range of 1-6, where one (strongly disagree) to six (strongly agree).

Data obtained from the collected questionnaires are analyzed using variance-based SEM via Partial Least Square-Structural Equation Modeling (PLS-SEM). The data in this study was processed using the SmartPLS version 4.0. Before testing, a validity test analysis and reliability test are carried out. After that, the R2 test and path coefficient estimation were carried out.

FINDINGS AND DISCUSSION

Validity and Reliability

Convergent validity is measured through indicators with outer loadings values >0.5 , and for average variance extracted (AVE) above 0.5 so that a variable is declared convergently valid (Sekaran & Bougie, 2016).

Table 1. Validity and Reliability Test Results

Variable	Indicator	AVE	Note	Composite Reliability	Cronbach's Alpha	Note
Financial Access	8	0.642	Valid	0.932	0.918	Reliable
Adoption of Digitalization	14	0.761	Valid	0.976	0.976	Reliable
Product Innovation	5	0,708	Valid	0,902	0,897	Reliable
Market Orientation	6	0,738	Valid	0,937	0,927	Reliable
Business Performance	8	0,697	Valid	0,941	0,938	Reliable

Source: Smart PLS 4.0

Table 2 below shows the adjusted R², this shows that 64.8% of the proportion of MSE performance variables is explained by financial access, digitalization adoption, product innovation and market orientation.

Table 2. Coefficient of Determination

Variable	Adjusted R-Square Value
MSE Performance	0.648

Source: Smart PLS 4.0

In this study, t-statistics significance values were greater than 1.96 or p-values were smaller than alpha 0.05, indicating that hypothesis testing was supported and had a relationship, which is significant.

Table 3. Hypothesis Test Results

Hypothesis	Original Sample	p- values	Conclusion
H ₁ : Financial access → Business performance	0.294	0.000	Supported
H ₂ : Adopt digitalization → Business performance	0.070	0.504	Not supported
H ₃ : Product innovation → Business performance	0.284	0.000	Supported
H ₄ : Market orientation → Business performance	0.370	0.000	Supported

Discussion

Testing hypothesis 1, results were obtained where financial access had a positive and significant effect on the business performance of women's MSEs in Belitung Regency. The results of this study are in line with several previous studies (Agyemang & Ansong, 2016; Turyakira et al., 2019; Khan et al., 2022; Jha & Alam, 2022). Financial access has a positive and significant effect on the performance of women's MSEs in Belitung Regency, showing that financial access plays a very important role in the performance of women's MSEs in Belitung Regency. Even though financial access is one of the obstacles for MSEs in Indonesia and in the Bangka Belitung Islands Province, financial access in Belitung Regency is very easy to obtain for female MSEs in Belitung Regency, which is demonstrated by the availability of funding sources both from bank financial institutions and in the form of business assistance from several agencies, making it easy for business owners to get financial access to improve business performance.

In this research, data was obtained where the source of financing for women's MSEs in Belitung Regency is mostly personal funds, the use of MSE funding sources from banking institutions or assistance funds from agencies, has not been widely utilized. This situation is possible, among other things, sufficient funds from personal sources, or according to opinion from Tambunan (2021) because the procedures are considered complicated by business owners, the availability of financial reports that are not in accordance with the requirements of banking institutions, the perception of business owners about complicated procedures. The results of this research on the influence of financial access on the business performance of women's MSEs in Belitung Regency, can be input for policy makers related to MSEs and MSMEs in Belitung Regency, to provide financial literacy, which can encourage MSEs to take advantage of financial access in Belitung Regency.

In the results of testing the second hypothesis, results were obtained where the adoption of digitalization had a positive but not significant effect on the business performance of women's MSEs in Belitung Regency. These results are not in line with previous research from Chen dan Kim (2023) and Shah et al. (2024), but in line with several previous studies (Azam, 2015; Lee dan Falahat, 2019). The two groups of research results show that the use of technology and digitalization in the 4.0 era in various aspects still get different results.

The results of this research illustrate the paradox of technological progress which should be able to encourage business performance, but in reality, technological progress has not shown a real role in improving business performance. Limited use of the internet does not support business activities much, due to lack of knowledge of using this technology for business

activities, even though information and communication technology can actually change many things in business (Tambunan, 2021). Relevant agencies can provide training to MSEs to improve human resource skills in utilizing technological and information developments to improve business performance.

The results of testing product innovation on the business performance of women's MSEs in Belitung Regency have a positive and significant effect. These results are in line with previous research (Herman et al., 2018; Agyapong et al., 2018; Lee & Falahat, 2019; Khan et al., 2022). This shows that product innovation, as a form of innovation carried out by female MSEs in Belitung Regency, can improve their business performance, when MSEs innovate.

Based on research results, the influence of product innovation on the business performance of women's MSEs in Belitung Regency, this can be input for relevant agencies in Belitung Regency in providing training related to understanding and developing product innovation that can be carried out by business owners, so that Belitung Regency women's MSEs can develop forms of product innovation from some of the knowledge from training.

Testing the final hypothesis, the influence of market orientation on the business performance of women's MSEs in Belitung Regency, has a positive and significant effect. The results of this test are in line with several previous studies, where market orientation has a positive and significant effect (Zhang & Zhu, 2016; Buli, 2017; Lekmat et al., 2018; Herman et al., 2018; Aliyu et al., 2019; Khan & Basir, 2020). Of the several variables that influence business performance in this research, market orientation has the greatest role, with an original sample of 0.370.

CONCLUSION AND RECOMMENDATION

Based on the four hypotheses proposed in this research, three hypotheses are supported, namely the influence of financial access on MSE business performance, the influence of product innovation on MSE business performance, and the influence of market orientation on business performance. Meanwhile, one hypothesis was not supported, namely the effect of digitalization adoption on business performance. From the results of supported hypothesis testing, it can be used as input for relevant agencies in making policies related to efforts to improve business performance for MSEs in Belitung Regency, where related to business performance, MSEs experience obstacles including access to finance, human resources, marketing and technology.

Technological constraints, in the perspective of digitalization adoption in this research, obtained test results that were not supported. In the current era of digitalization, the results of

testing the effect of digitalization adoption on performance show a paradox, where communication and information technology in reality has not been able to encourage business performance, due to the constraints of limited knowledge and human resources. Therefore, the government and related agencies can take policies in the form of increasing the knowledge and skills of human resources, through training to be able to utilize communication and information technology for the development of business activities.

This research still has limitations, where the research is still limited to women's MSEs in Belitung Regency. Furthermore, for future research, it can be expanded to research for all MSEs, both male and female, as well as comparing these genders, so that it can provide more complete input for policy makers in the local area. In addition, further research needs to be carried out regarding the adoption of digitalization.

REFERENCES

- Agyapong, A., Mensah, H. K., & Ayuuni, A. M. (2018). The moderating role of social network on the relationship between innovative capability and performance in the hotel industry. *International Journal of Emerging Markets*, 13(5), 801-823. <https://doi.org/10.1108/IJoEM-11-2016-0293>
- Agyemang, O. S., & Ansong, A. (2017). Corporate social responsibility and firm performance of Ghanaian SMEs: Mediating role of access to capital and firm reputation. *Journal of Global Responsibility*, 8(1), 47-62. <https://doi.org/10.1108/JGR-03-2016-0007>
- Ali, G. A., Hilman, H., & Gorondutse, A. H. (2020). Effect of entrepreneurial orientation, market orientation and total quality management on performance: Evidence from Saudi SMEs. *Benchmarking: An International Journal*, 27(4), 1503-1531. <https://doi.org/10.1108/BIJ-08-2019-0391>
- Aliyu, R. M., Ahmad, T. S. B. T., & Binti, N. (2019). Mediating role of innovation on the relationship between market orientation, social network, training, access to finance and the business performance of women entrepreneurs. *International Journal Of Academic Research In Business And Social Sciences*, 9(2), 677-685. <http://dx.doi.org/10.6007/IJARBS/v9-i2/5606>
- Azam, Md. S. (2015). Diffusion of ICT and SME performance. *E-Services Adoption: Processes by Firms in Developing Nations Advances in Business Marketing & Purchasing*, 23A, 7-290. <http://dx.doi.org/10.1108/S1069-096420150000023005>
- Bank Indonesia. (2024). Sinergi memperkuat ketahanan dan kebangkitan ekonomi nasional. Diakses dari: <https://perbanas.org/publikasi/berita-perbanas/sinergi-memperkuat-ketahanan-dan-kebangkitan-ekonomi-nasional>
- Biswas, A. (2014). Financing constraints for MSME sector. *International Journal of Interdisciplinary and Multidisciplinary Studies*, 1(5), 60-68. https://scholar.google.com/scholar?hl=id&as_sdt=0%2C5&q=Financing+Constraints+for+MSME+Sector&btnG
- BPS. (2019). Analisis hasil SE2016, lanjutan potensi peningkatan kinerja Usaha Mikro Kecil. Diakses dari:

<https://www.bps.go.id/id/publication/2019/03/05/66912048b475b142057f40be/analisis-hasil-se2016-lanjutan-potensi-peningkatan-kinerja-usaha-mikro-kecil.html>

- BPS. (2023). Profil industri mikro dan kecil 2022. Diakses dari: <https://www.bps.go.id/id/publication/2023/10/27/c1f1e0126c61890fdf03d74c/profil-industri-mikro-dan-kecil-2022.html>
- Buli, B. M. (2017). Entrepreneurial orientation, market orientation and performance of SMEs in the manufacturing industry: Evidence from Ethiopian enterprises. *Management Research Review*, 40(3), 292-309. <https://doi.org/10.1108/MRR-07-2016-0173>
- Byukusenge, E., Munene, J. C., & Orobia, L. A. (2021). Managerial competencies and business performance: innovation as a mediator in Rwandan SMEs. *International Journal of Law and Management*, 63(5), 445-463. <https://doi.org/10.1108/IJLMA-09-2017-0217>
- Chen, P., & Kim, S. (2023). The impact of digital transformation on innovation performance- The mediating role of innovation factors. *Heliyon*, 9(3), 1-11. <https://doi.org/10.1016/j.heliyon.2023.e13916>
- Garson, D. (2016). *Partial Least Squares: regression and structural equation Models*. Asheboro, North Country: Statistical Associates Publishers.tam.
- Herman, H., Hady, H., & Arafah, W. (2018). The influence of market orientation and product innovation on the competitive advantage and its implication toward Small and Medium Enterprises (UKM) performance. *International Journal of Science and Engineering Invention*, 4(8), 8-21. <https://doi.org/10.23958/ijsei/vol04-i08/02>
- Issau, K., Acquah, I. S. K., Gnankob, R. I., & Hamidu, Z. (2021). Innovation orientation and performance of small and medium-sized enterprises (SMES) in Ghana: evidence from manufacturing sector. *Innovation & Management Review*, 19(4), 290-305. <https://doi.org/10.1108/INMR-07-2020-0092>
- Jha, P., & Alam, M. M. (2022). Antecedents of women entrepreneurs' performance: an empirical perspective. *Management Decision*, 60(1), 86-122. <https://doi.org/10.1108/MD-07-2020-0849>
- Karabulut, A. T. (2015). Effects of innovation types on performance of manufacturing firms in Turkey. *Procedia-Social and Behavioral Sciences*, 195, 1355-1364. <https://doi.org/10.1016/j.sbspro.2015.06.322>
- Khan, I., & Bashir, T. (2020). Market orientation, social entrepreneurial orientation, and organizational performance: The mediating role of learning orientation. *Iranian Journal of Management Studies*, 13(4), 673-703. <https://doi.org/10.22059/ijms.2020.289467.673800>
- Khan, R. U., Arif, H., Sahar, N. E., Ali, A., & Abbasi, M. A. (2022). The role of financial resources in SMEs' financial and environmental performance; the mediating role of green innovation. *Green Finance*, 4(1), 36-53. <https://doi.org/10.3934/GF.2022002>
- Lee, N., Sameen, H., & Cowling, M. (2015). Access to finance for innovative SMEs since the financial crisis. *Research policy*, 44(2), 370-380. <https://doi.org/10.1016/j.respol.2014.09.008>
- Lee, Y. Y., & Falahat, M. (2019). The impact of digitalization and resources on gaining competitive advantage in international markets: Mediating role of marketing, innovation and learning capabilities. *Technology Innovation Management Review*, 9(11), 26-38. <http://doi.org/10.22215/timreview/1281>

- Lekmat, L., Selvarajah, C., & Hewege, C. (2018). Relationship between market orientation, entrepreneurial orientation, and firm performance in Thai SMEs: The mediating role of marketing capabilities. *International Journal of Business and Economics*, 17(3), 213-237. https://ijbe.fcu.edu.tw/assets/ijbe/past_issue/No.17-3/pdf/vol_17-3-2.pdf
- Lu, J., & Zhang, G. (2016). The effect of customer orientation and entrepreneurial orientation on performance of SMEs: Comparison between Chinese and South Korean SMEs. *Global Journal of Management and Business Research: Administration and Management*, 16, 1-19. https://scholar.google.com/scholar?hl=id&as_sdt=0%2C5&q=The+Effect+of+Custo+mer+Orientation+and+Entrepreneurial+Orientation+on+Performance+of+SMEs%3A+Comparison+between+Chinese+and+South+Korean+SMEs+&btnG=
- Na, K., & Kang, Y. H. (2019). Relations between innovation and firm performance of manufacturing firms in Southeast Asian emerging markets: Empirical evidence from Indonesia, Malaysia, and Vietnam. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(4), 98-113. <https://doi.org/10.3390/joitmc5040098>
- Nguyen, T. A. N. (2017). Financing constraints on SMEs in emerging markets: does financial literacy matter? *Review of Socio-Economic Perspectives*, 2(2), 53-65. <https://reviewsep.com/index.php/rsep/article/view/26>
- Prijadi, R., Wulandari, P., Desiana, P. M., Pinagara, F. A., & Novita, M. (2020). Financing needs of micro-enterprises along their evolution. *International Journal of Ethics and Systems*, 36(2), 263-284. <https://doi.org/10.1108/IJOES-05-2018-0071>
- Shah, N., Zehri, A. W., Saraih, U. N., Abdelwahed, N. A. A., & Soomro, B. A. (2024). The role of digital technology and digital innovation towards firm performance in a digital economy. *Kybernetes*, 53(2), 620-644. <https://doi.org/10.1108/K-01-2023-0124>
- Sekaran, U & Bougie, R (2016). *Research methods for business (Seventh edition)*. USA: Wiley.
- Tambunan, T. T. (2018). The performance of Indonesia's public credit guarantee scheme for MSMEs: A regional comparative perspective. *Journal of Southeast Asian Economies*, 35(2), 319-332. <https://www.jstor.org/stable/26539220>
- Tambunan, T. T. (2021). *UMKM di Indonesia: perkembangan, kendala, dan tantangan*. Indonesia: Prenada Media.
- Turyakira, P., Kasimu, S., Turyatunga, P., & Nakyejwe Kimuli, S. (2019). The joint effect of firm capability and access to finance on firm performance among small businesses: A developing country perspective. *African Journal of Business Management*, 13(6), 198-206. <https://doi.org/10.5897/AJBM2019.8758>
- Zhang, J., & Zhu, M. (2016). Market orientation, product innovation and export performance: evidence from Chinese manufacturers. *Journal of Strategic Marketing*, 24(5), 377-397. <https://doi.org/10.1080/0965254X.2015.1052538>