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The Effect of Risk-Based Efficiency Value on Firm Value: A Case Study in Indonesia

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Abstract

The purpose of this study is to analyze the effect of risk efficiency, financial decisions, and financial performance on firm value due to advances in financial reporting technology. This research was conducted on all banking sub-sector companies listed on the Indonesian capital market during a period of eight years, namely 2012–2019 which were selected using the purposive sampling method. The advancement of financial reporting technology is measured by two indicators based on the Internet financial reporting approach. Risk efficiency is measured using three indicators with a risk proxy relative efficiency approach using value at risk. Financial decisions are measured by two indicators that represent funding decisions and investment decisions. Financial performance is measured by two indicators with the profitability approach, and firm value is measured by two indicators based on the investor perception approach. The data analysis technique in this study used multivariate analysis with SEM-PLS. The empirical findings of this study are the advances in financial reporting technology, financial decisions, and risk-based efficiency value have a significant effect on firm value, while financial performance does not have a significant effect on firm value. Banking companies reduce risk to achieve efficiency and result in lower profits.

Keywords: Risk-Based Efficiency Value, Financial Reporting Technology, Financial Decisions, Financial Performance, Firm Value

JEL Classification Code: G32, G34, L25

1. Introduction

The industrial revolution 4.0 has introduced information technology into all aspects of life and made various changes in society to adapt to digital technology, be it in the labor market, education, changes in operational processes, or economic growth (Maresova et al., 2018). The term industrial revolution 4.0 was first born in Germany in 2011 when the Hannover Fair was held. Facing the era of the industrial revolution 4.0 must be based on a clear conceptual approach, not only focusing on technology development but also covering organizational management (Horvat et al., 2018). New risks can arise due to changes in the impact of the industrial revolution 4.0, so it is necessary to pay attention to aspects of risk management (Tupa et al., 2017).

In addition to having an impact related to the efficient use of technology, investment activities during the 4.0 industrial revolution also had an impact due to the emergence of disruption which was likely to disrupt the old system order (Horvat et al., 2018; Maresova et al., 2018). Markowitz (1952) introduced a portfolio diversification model where non-systematic risk reduction is carried out by diversifying so that only systematic risk is left behind, known as the insurance principle. Roy (1952) also stated that the probability of future events is full of uncertainty as such, one expects profit or income when holding assets. Roy's safety first principle was instrumental in the development of downside risk measures.

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Risk management is the identification, evaluation, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability or impact of unfortunate events or to maximize the realization of opportunities. Risk management is an option, especially if it is related to the basis of management theory related to efficiency. Babbage (1832) discussed the efficiency associated with the use of machines in manufacturing. The theory of efficiency is further clarified by Taylor (1911) stated that in the past humans were the first, while in the future, systems will be the first, and efficiency is important in management. Efficiency in a company is determined by the decisions taken in a company related to risk factors.

The calculation of risk using the concept of probability was first applied by Morgan in 1994 who created a Risk Metrics System that uses Value at Risk (VaR) calculations (Best, 1998). The concept of Value at Risk (VaR) was later developed by Jorion (2001). Sawik (2012) examined the Value at Risk return of stocks, Iqbal and Azher (2014) examined the Value at Risk of stock portfolios. The weakness of the risk theory is that it does not take into account inputs and outputs for measuring efficiency. The superiority of the relative efficiency theory can determine the potential improvement to achieve the maximum level of efficiency. Efficiency measurement uses a relative efficiency approach with Data Envelopment Analysis.

Every industrial revolution will be followed by the emergence of efficiency theory. After the first industrial revolution, the theory of efficiency from Babbage (1832) had emerged, then after the second industrial revolution, the theory of efficiency from Taylor (1911) had emerged. Continued after the III industrial revolution, the theory of efficiency by Farrell (1957) and efficiency theory by Charnes et al. (1978) which was perfected by Banker et al. (1984) with data envelopment analysis, had emerged. The results of the work on efficiency theory are then developed in the form of empirical research on efficiency in various sectors of companies and industries by Aghimien et al. (2016) who researched banking companies, Gandhi and Sharma (2018) who researched hospitals, Jaiyeoba et al. (2018) who researched micro-enterprises, Juniar and Fadah (2019) who researched state-owned companies, and Vikas and Bansal (2019) who researched oil and gas companies. The fourth industrial revolution, which caused disruption due to uncertainty factors, gave rise to the idea that the risk theory resulted in a modification of the concept of relative efficiency where risk theory was used in combination with data envelopment analysis which was calculated based on risk with a percentage of probability or Value at Risk. The result of this merger becomes a variable risk-based efficiency value which is the novelty of this research.

2. Literature Review

2.1. Advances in Financial Report Technology and Financial Decisions

The advancement of financial reporting technology in research is the level of compliance with the Internet financial reporting content index and the Internet financial reporting technology index. Internet Financial Reporting (IFR) is a method companies use to post their financial information via the internet or company-owned websites (Ashbaugh et al., 1999). Almilia and Budisusetyo (2008) stated that the Internet Financial Reporting (IFR) index tends to support the importance of technology over the content of financial statements.

Financial decisions in this study are decisions that companies must make in relation to funding and investment activities. The theory of funding decisions was first introduced by Donaldson (1961) in his survey of companies in the United States, while Myers (1984) developed an alternative theory known as pecking order theory which stated that there is a kind of pecking order for companies in funding decisions. Funding decisions can be measured based on the debt ratio (Bukair, 2019; Efni, 2017; Tandiontong & Rusdin, 2015). Other financial decision measures for bank operational activities related to the main function of banking as an intermediary financial institution, namely collecting and channeling funds can use NIM (net interest margin) (Apergis & Lau, 2017; Ofori-Sasu et al., 2019; Saksonova, 2014; Sari et al., 2018). Investment decisions are decisions on wealth that are managed by the company. The investment decision directly affects the amount of investment profitability and the company's future cash flows (Efni, 2017). EPS (earning per share) has become a useful investment decision tool for investors, as it shows prospects and future growth, besides that, price earnings ratio (PER) can also be used as a measure of investment decisions taken by the company (Dwijayani et al., 2017).

Risk-based efficiency value is the value of relative efficiency based on the percentage of risk based on the value of Value at Risk with a confidence level of 99%, 95%, and 90%. Risk-based efficiency value is the relative efficiency value calculated using data envelopment analysis based on the percentage of risk based on the Value at Risk value. Risk-based efficiency value is a novelty of this research and the synthesis results are based on the concept of risk probability, the concept of risk efficiency, and the concept of value at risk (VaR). The concept of the risk probability level of the percentage of confidence used is 90%, 95%, and 99%. The basis is the initial theory about risk by Roy (1952) and Markowitz (1952) which was later developed into a capital assets pricing model (CAPM) by Treynor (1962) and developed again by Best (1998) and Jorion (2001) to be value-at-risk (VaR). The concept of capital assets pricing model (CAPM) and about portfolio efficiency and value at risk (VaR) is the basis for the

relative efficiency of value at risk (VaR) which is calculated using data envelopment analysis by applying the concept of a variable return to scale (VRS) or DEA-BCC. where the increase in input and output does not have the same proportion so that it can be an increasing return to scale (IRS) or it can also be decreasing returns to scale (DRS) (Banker et al., 1984). The use of data envelopment analysis is in line with research from Aghimien et al. (2016), Gandhi and Sharma (2018), Jaiyeoba et al. (2018), and Vikas and Bansal (2019), while the use of value at risk (VaR) is consistent with research from Gaio et al. (2018), Iqbal and Azher (2014), and Sawik (2012). This research only measures the value of efficiency and the value of risk, while this research tries to find the novelty of the research by combining the two methods.

Financial performance in this study is the percentage level of the company to generate income based on assets, equity, and operational activities. The ratio has been used as a measure of performance in many ways. Altman (1968) developed a model that uses the ratio to predict corporate bankruptcy. Before Altman (1968), there was Beaver (1966) who also examined financial ratios in predicting the financial health of companies. The measurement of financial performance, especially for banking companies, which can be used is ROA (Return On Assets), which shows how much the company's relative profit earns on its total assets, and ROE (Return on Equity), which is the percentage of the amount of net profit returned. to shareholders (Dinh & Pham, 2020; Khanifah et al., 2020; Nguyen & Nguyen, 2020). The performance measure related to the next banking company based on Bank Indonesia regulations is BOPO (operating costs to operating income) (Sari et al., 2018).

The firm value in this study is the investor's perception of the company in relation to the stock market price. The long-term goal of the company is to optimize the value of the firm. The higher the value of the firm, the more prosperous the owner will be. The value of the firm will be reflected in the market price of its shares (Fama, 1978). The investment decision is an important factor in the company's financial function. Fama (1978) states that the firm value is determined solely by investment decisions. This opinion can be interpreted that investment decisions are important because to achieve the company's goals, namely maximizing the prosperity of shareholders, will only be generated through the company's investment activities. The objective of investment decisions is to obtain a high level of return with a certain level of risk. High profits accompanied by manageable risks are expected to increase the value of the firm, which means increasing the prosperity of shareholders. Nanda et al. (2019) argued that the value of a firm is a combination of assets owned by the company with investment options in the future. Firm value is defined as the fair value of the company which reflects investors' perceptions of the share issuer. According to Dwijayani et al. (2017) and Efni (2017), share price reflects the value of the firm so that the value of the firm is reflected in the market price of the company's shares. Price to Book Value (PBV) is an indicator in assessing a company that illustrates how much the market appreciates the book value of a company's shares. Another indicator used in measuring firm value is to use Tobins'Q. This measure represents a current financial market estimate of the return on each incremental investment (Efni, 2017; Nanda et al., 2019).

2.2. Hypotheses

The results of research on the relationship between Internet financial reporting (IFR) and financial decisions made by Birt et al. (2017) and Olowookere and Agbesanya (2018) show that internet financial reporting (IFR) has a significant effect on financial decisions. The results of research on advances in financial reporting technology on risk efficiency have not been found so that the approaching research is research on the relationship between internet financial reporting (IFR) and risks carried out by Arner et al. (2017) and Kavassalis et al.,(2017) shows the results that advances in financial reporting technology have a significant effect on risk. The results of research on the relationship between internet financial reporting (IFR) and financial performance conducted by Agyei-Mensah (2018), Khalil and O'Sullivan (2017), Kwateng et al. (2019), and Lopez-Arceiz et al., (2019) showed that Internet financial reporting (IFR) has a significant effect on financial performance. The results of research on the relationship between Internet financial reporting (IFR) and firm value were carried out by Keliwon et al. (2018) and Sia et al. (2018) who showed that internet financial reporting (IFR) has a significant effect on firm value. The results of research on the relationship between financial decisions and risk efficiency have not been found, so researchers use research that is close to that of financial decisions and risks.

Several research results on the relationship between financial decisions and risk were carried out by Dwijayani et al. (2017), Efni (2017), Eldomiaty et al. (2014), Nanda et al. (2019), and Tandiontong and Rusdin (2015) who showed that financial decisions have a significant effect on the risk of a company. The results of the study which indicate that financial decisions have a significant effect on financial performance are the results of the study from Affandi et al. (2020), Hajering et al. (2018), Muchtar et al. (2018), Shahwan (2018), and Veeraraghavan (2018). Other research results show that financial decisions have a significant effect on financial performance and more specifically by using the same financial performance indicators as this study, namely return on assets (ROA) and return on equity (ROE), (Alali, 2017; Nassar, 2016). The results of research examining the relationship between financial decisions and firm value conducted by Nanda et al. (2019), and Tandiontong and Rusdin (2015) showed that financial decisions have a

significant effect on firm value. The results of research on the relationship between risk efficiency and firm value have not been found, so the researchers used a close approach, which examined the relationship between risk and efficiency on firm value. Several studies that examine the relationship between risk and firm value such as Abdullah et al. (2017) and Senol et al. (2017) indicated that risk has a significant effect on firm value. The results of research examining the relationship between efficiency and firm value by Sumani and Suryaningsih (2020) showed that efficiency has a negative effect on firm value. Research on the relationship between financial performance and risk efficiency has not been found. Some of the research results that have discussed the relationship between performance and risk, namely by Chong et al. (2018), Devie et al. (2019), Majumder and Li (2018), Musallam (2018), and Nguyen and Nguyen (2015) indicated that financial performance has a significant effect on risk. Some of the results of previous research from Jubaedah et al. (2016), Sucuahi and Cambarihan (2016), and Sudiyatno et al. (2017) showed that financial performance has a significant effect on firm value.

H1: *Advances in financial reporting technology affect financial decisions.*

H2: *Advances in financial reporting technology affect risk-based efficiency value.*

H3: *Advances in financial reporting technology affect financial performance.*

H4: *Advances in financial reporting technology affect firm value.*

H5: *Financial decisions affect risk-based efficiency value.*

H6: *Financial decisions affect financial performance.*

H7: *Financial decisions affect firm value.*

H8: *Risk-based efficiency value affects firm value.*

H9: *Financial performance affects risk-based efficiency value.*

H10: *Financial performance affects firm value.*

3. Methodology

This research design uses explanatory research based on research objectives to determine and analyze the effect of exogenous variables on endogenous variables. The exogenous variables are the advancement of financial reporting technology (KTLK), while endogenous variables are financial decisions (KPK), risk-based efficiency value (RBEV), financial performance (KJK), firm value (NP). The sampling method used purposive sampling with a total of 21 banks listed on the Indonesian capital market during the period 2012–2019 so that the number of observations was 168. Hypothesis testing used the t-test with the help of Structural Equation Model Partial Least Square (SEM-PLS).

4. Results and Discussion

Based on the structural model that was built, the first testing stage was carried out, namely the validity test. Outer loadings: are the estimated relationships in reflective measurement models. They determine an item's absolute contribution to its assigned construct. Manifest variables with outer loading 0.7 or higher are considered highly satisfactory. While a loading value of 0.5 is regarded as acceptable, the manifest variables with a loading value of less than 0.5 should be dropped. The results of the validity test by looking at the outer loading value of all indicators show that DER and BOPO do not meet the requirements because the outer loading value is below 0.5 so they are excluded from the model. The results of further testing with an improved model showed the following results:

Based on Table 1, it can be seen that the outer loading value of all indicators in the model is greater than 0.5 with a *p*-value less than 0.05, so all indicators are declared valid. The AVE value of all variables, namely KTLK, KPK, RBEV, KJK, and NP is greater than 0.5 so that all variables are declared valid. Composite reliability is a measure of internal consistency in scale items. The minimum *composite reliability* value in SEM analysis should exceed 0.7. The calculation of the composite reliability value of all variables shows that the value is greater than 0.7 so that all variables are declared reliable.

Table 2 shows that hypotheses 1, 3, 4, 6, 8, and 9 are proven to be significant, while hypotheses 2, 5, 7, and 10 are not proven to be significant. Based on the results of hypothesis testing, it shows that advances in financial reporting technology have a significant positive effect on financial decisions. If the company applies advances in financial reporting technology, it will have four advantages, namely efficiency and timeliness, ease and speed of access to information (Ashbaugh et al., 1999). Advances in financial reporting technology have made disclosing information about company finances using information technology more relevant and easier to understand (Birt et al., 2017). Advances in financial reporting technology guide for making investment decisions based on the information presented (Omran & Ramdhony, 2016). Parties involved in making financial decisions are easier to use and analyze using advances in financial reporting technology. The results of the study support previous research conducted by Birt et al. (2017) and Olowookere and Agbesanya (2018).

The results showed that advances in financial reporting technology had no significant effect on risk-based efficiency value. Banking companies are companies with strict regulations from the government, Bank Indonesia, and the Financial Services Authority (FSA). Various regulations related to performance appraisal were set by the government because of the important role of banking companies in the

Table 1: Results of the Research Model Validity and Reliability Test

Variable	Indicator	Outer Loading	*p* values	AVE	Description	CR	Description
KTLK	IK	0.731	0.000	0.730	Valid	0.842	Reliable
	IT	0.963	0.000		Valid		
KPK	NIM	0.542	0.000	0.610	Valid	0.743	Reliable
	EPS	0.962	0.000		Valid		
RBEV	ER90%	0.998	0.000	0.845	Valid	0.916	Reliable
	ER95%	1.000	0.000		Valid		
	ER99%	0.998	0.000		Valid		
KJK	ROA	0.908	0.000	0.831	Valid	0.907	Reliable
	ROE	0.931	0.000		Valid		
NP	PBV	0.937	0.000	0.997	Valid	0.999	Reliable
	Tobin's *Q*	0.885	0.000		Valid		

Table 2: Hypothesis Test Results

Hypothesis	Relations Between Variables	Relationship Coefficient	*p* values	Description
1	KTLK–KPK	0.441	0.000	Significant
2	KTLK–RBEV	0.006	0.934	Not significant
3	KTLK–KJK	–0.146	0.039	Significant
4	KTLK–NP	0.233	0.002	Significant
5	KPK–RBEV	–0.160	0.143	Not significant
6	KPK–KJK	0.730	0.000	Significant
7	KPK–NP	0.059	0.671	Not significant
8	RBEV–NP	–0.176	0.002	Significant
9	KJK–RBEV	–0.198	0.041	Significant
10	KJK–NP	0.147	0.168	Not significant

stability of the country's economy. The results of this study are in line with research from Teymouri and Ashoori (2011). The results of this study are not in line with several studies related to technological advances with risks, namely, Arner et al. (2017) and Kavassalis et al. (2017). The results of data analysis in this study indicate that advances in financial reporting technology have a negative coefficient value and have a significant effect on financial performance. Increasing the use of technology in a company, especially for banking companies, requires a lot of money. These costs will always be incurred because technological developments occur all the time. This means that the higher the value of advances in financial reporting technology, the lower the company's financial performance because the costs (expenses) incurred, will reduce company profits. The results of this study are in line with the research from Alsartawi (2018), Khalil and O'Sullivan (2017), Kwateng et al. (2019), Lopez-Arceiz et al. (2019), and Tabash (2019).

The results of data analysis in this study indicate that advances in financial reporting technology have a positive coefficient value and have a significant effect on firm value. According to Ashbaugh et al. (1999), there are four advantages when applying advances in financial reporting technology. The results of this study support the results of previous studies from Adityawarman and Khudri (2018). Keliwon et al. (2018), and Sia et al. (2018). The results of this study indicate that financial decisions have no significant effect on risk-based efficiency value. The results

of this study are not in line with the research by Dahir et al. (2018), Desai and Nguyen (2015), Dwijayani et al. (2017), Efni (2017), Nanda et al. (2019), and Tandiontong and Rusdin (2015). The results of data analysis in this study indicate financial decisions have a positive coefficient value and have a significant effect on financial performance. The results of this study which indicate that financial decisions have a significant effect on financial performance are consistent with the results of the study from Affandi et al. (2020), Hajering et al. (2018), Muchtar et al. (2018), Shahwan (2018), and Veeraraghavan (2018). Other research results show that financial decisions have a significant effect on financial performance and more specifically by using the same financial performance indicators as this study, namely return on assets (ROA) and return on equity (ROE), namely research from Alali (2017) and Nassar (2016).

The results of this study indicate that financial decisions have no significant effect on firm value. Investors who wish to invest in banking companies on the Indonesia Stock Exchange receive a comprehensive range of information that is presented by banking companies and can be accessed easily. This makes all parties have the same information that comes from the same financial statements so that any financial decisions taken by banking companies have no effect on firm value so that it reflects the signal theory of Ross (1977). The results of the study which showed that there was no significant influence between financial decisions and firm value are in line with the research by Dwijayani et al. (2017) and Efni (2017). While other studies are not in line with the results of this study such as Nanda et al. (2019), and Tandiontong and Rusdin (2015). The results of data analysis in this study indicate that risk-based efficiency value has a significant effect and has a negative coefficient value on firm value. Research from Sumani and Suryaningsih (2020) who examined the efficiency and firm value is consistent with the results of this study where efficiency has a significant negative effect on firm value. Risk and firm value are like two sides of the same coin; those who write that risk cannot be anticipated and who avoid risk will never take risks and to strike a balance requires consideration of risk and return. According to Fama (1978), the value of the company can increase if the company can get a high level of profit with manageable risks. The results of this study prove that risk-based efficiency value can be used as a consideration in increasing firm value. Banking companies that are bound by various regulations that have been established by the government will always maintain risk to comply with the regulatory guidelines set by the government so that efficiency can be achieved.

The results of this study indicate that financial performance has a negative coefficient value that has a significant effect on risk-based efficiency value. These results support the results of research from Gan (2018) who indicated that financial performance has a significant negative effect on the risk of a company. The results of this study support several research results, namely, Chong et al. (2018), Devie et al. (2019), Majumder and Li (2018), Musallam (2018), and Nguyen and Nguyen (2015). The results of this study indicate that financial performance has no significant effect on firm value. The results of the study support previous research conducted by Deswanto and Siregar (2018) but do not support the results of research from Jubaedah et al. (2016), Sucuahi and Cambarihan (2016), and Sudiyatno et al. (2017).

5. Conclusion

The results of this study indicate that advances in financial reporting technology have a significant effect on financial decisions, financial performance, and firm value but have no significant effect on risk-based efficiency value. Financial decisions have a significant effect on financial performance but have no significant effect on risk-based efficiency and firm value. Risk-based efficiency value has a significant effect on firm value. Financial performance has an effect on risk-based efficiency value but does not have a significant effect on firm value. Future research may use other risk proxies to measure efficiency, both systematic risk, and unsystematic risk.

The results of this study are expected to provide benefits for banking companies to pay attention to risk efficiency and to keep abreast of technological developments so that investors' perceptions of firm value will increase. Furthermore, we can expand the discussion by combining the concept of financial decision theory about investment from Fama (1978) and about funding from Myers (1984) as well as the concept of the relative efficiency of Banker et al. (1984) and the concept of risk regarding the capital assets pricing model (CAPM) from Treynor (1962).

References

Abdullah, M., Janor, H., Hamid, M., & Yatim, P. (2017). The effect of enterprise risk management on firm value: Evidence from Malaysian technology firms. *Jurnal Pengurusan*, *49*, 3–11. https://doi.org/10.17576/pengurusan-2017-49-01

Adityawarman, A., & Khudri, T. B. Y. (2018). The impact of internet financial reporting practices on the company's market value: A study of listed manufacturing companies in Indonesia. In: *6th International Accounting Conference (IAC 2017),* Yogyakarta, Indonesia, August 27–29, 2017 (pp. 48–53). https://doi.org/10.2991/iac-17.2018.9

Affandi, M. A., Murwaningsari, E., Mayangsari, S., & Dwimulyani, S. (2020). Role of ABAS and bureaucratic reformation in improving governmental financial performance through financial decision making. *Journal of Asian Finance, Economics, and Business*, *7*(11), 1069–1075. https://doi.org/10.13106/jafeb.2020.vol7.no11.1069

Aghimien, P. A., Kamarudin, F., Hamid, M., & Noordin, B. (2016). The efficiency of Gulf Cooperation Council banks: Empirical evidence using data envelopment analysis. *Review of International Business and Strategy*, *26*(1), 118–136. https://doi.org/10.1108/RIBS-11-2013-0111

Agyei-Mensah, B. K. (2018). Impact of corporate governance attributes and financial reporting lag on corporate financial performance. *African Journal of Economic and Management Studies*, *9*(3), 349–366. https://doi.org/10.1108/AJEMS-08-2017-0205

Alali, S. M. (2017). The impact of capital structure on the financial performance of the Jordanian industrial companies listed on the Amman stock exchange for the period 2012–2015. *Asian Journal of Finance & Accounting*, *9*(2), 369–386. https://doi.org/10.5296/ajfa.v9i2.12076

Almilia, L. S., & Budisusetyo, S. (2008). Corporate Internet reporting of the banking industry and LQ45 firms: An Indonesia example. *The 1st Parahyangan International Accounting & Business Conference,* Bandung, Indonesia, 4–5 May 2017 (pp. 1–26). https://doi.org/10.2139/ssrn.1218947

Alsartawi, A. M. (2018). Online financial disclosure and firms' performance. *World Journal of Entrepreneurship, Management, and Sustainable Development*, *14*(2), 178–190. https://doi.org/10.1108/wjemsd-11-2017-0082

Altman, E. I. (1968). Financial ratios, discriminant analysis, and the prediction of corporate bankruptcy. *The Journal of Finance*, *23*(4), 589–609. https://doi.org/10.2307/2978933

Apergis, N., & Lau, C. K. M. (2017). How deviations from FOMC's monetary policy decisions from a benchmark monetary policy rule affect bank profitability: Evidence from U.S. Banks. *Journal of Financial Economic Policy*, *9*(4), 354–371. https://doi.org/10.1108/JFEP-02-2017-0008

Arner, D., Barberis, J., & Buckley, R. (2017). FinTech, RegTech, and the reconceptualization of financial regulation. *Northwestern Journal of International Law & Business*, *37*(3), 371–413. https://doi.org/10.1177/0027950111411368

Ashbaugh, H., Johnstone, K. M., & Warfield, T. D. (1999). Corporate reporting on the Internet. *Accounting Horizons*, *13*(3), 241–257. https://doi.org/10.2308/acch.1999.13.3.241

Babbage, C. (1832). *The economy of machinery*. Cambridge, UK: The University of Cambridge.

Banker, R. D., Charnes, A., & Cooper, W. W. (1984). Some models for estimating technical and scale inefficiencies in data envelopment analysis. *Management Science*, *30*(9), 1078–1092. https://doi.org/10.1287/mnsc.30.9.1078

Beaver, W. H. (1966). Financial ratios as predictors of failure. *Journal of Accounting Research*, *4*, 71–111. https://doi.org/10.2307/2490171

Best, P. (1998). *Implementing value at risk*. New York, NY: John Wiley & Sons. https://doi.org/.1037//0033-2909.I26.1.78

Birt, J. L., Muthusamy, K., & Bir, P. (2017). XBRL and the qualitative characteristics of useful financial information. *Accounting Research Journal*, *30*(1), 107–126. https://doi.org/10.1108/ARJ-11-2014-0105

Bukair, A. A. A. (2019). Factors influencing Islamic banks' capital structure in developing economies. *Journal of Islamic Accounting and Business Research*, *10*(1), 2–20. https://doi.org/10.1108/JIABR-02-2014-0008

Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring the efficiency of decision-making units. *European Journal of Operational Research*, *2*(6), 429–444. https://doi.org/10.1016/0377-2217(78)90138-8

Chong, L. L., Ong, H. B., & Tan, S. H. (2018). Corporate risk-taking and performance in Malaysia: The effect of board composition, political connections, and sustainability practices. *Corporate Governance: The International Journal of Business in Society*, *18*(4), 635–654. https://doi.org/10.1108/CG-05-2017-0095

Dahir, A. M., Mahat, F. B., & Ali, N. A. Bin. (2018). Funding liquidity risk and bank risk-taking in BRICS countries: An application of system GMM approach. *International Journal of Emerging Markets*, *13*(1), 231–248. https://doi.org/10.1108/IJoEM-03-2017-0086

Desai, C., & Nguyen, K. (2015). What explains the change in a firm's idiosyncratic volatility after a dividend initiation? *Managerial Finance*, *41*(11), 1138–1158. https://doi.org/10.4324/9780080938196

Deswanto, R. B., & Siregar, S. V. (2018). The associations between environmental disclosures with financial performance, environmental performance, and firm value. *Social Responsibility Journal*, *14*(1), 180–193. https://doi.org/10.1108/SRJ-01-2017-0005

Devie, D., Liman, L. P., Tarigan, J., & Jie, F. (2019). Corporate social responsibility, financial performance, and risk in the Indonesian natural resources industry. *Social Responsibility Journal*, *16*(1), 73–90. https://doi.org/10.1108/SRJ-06-2018-0155

Dinh, H. T., & Pham, C. D. (2020). The effect of capital structure on the financial performance of Vietnamese listing pharmaceutical enterprises. *Journal of Asian Finance, Economics, and Business*, *7*(9), 329–340. https://doi.org/10.13106/JAFEB.2020.VOL7.NO9.329

Donaldson, G. (1961). Corporate debt capacity: A study of corporate debt policy and the determination of corporate debt capacity. *The Journal of Finance, 17*(3), 554–555. https://doi.org/10.2307/2977084

Dwijayani, H., Surachman, M., Sumiati, K., & Djawahir, A. (2017). The influence of the investment policy and information asymmetry. *International Journal of Economic Perspectives*, *11*(3), 2036–2042. http://jemp.org/volume-11-issue-3-2036-2042/

Efni, Y. (2017). The mediating effect of investment decisions and financing decisions on the effect of corporate risk and dividend policy against corporate value. *Investment Management and Financial Innovations*, *14*(2), 27–37. https://doi.org/10.21511/imfi.14(2).2017.03

Eldomiaty, T. I., Atia, O., Badawy, A., & Hafez, H. (2014). Mutual benefits of transferring stock risks to dividend policy. *Journal of Economic and Administrative Sciences*, *30*(2), 131–158. https://doi.org/10.1108/jeas-05-2013-0016

Fama, E. F. (1978). The effects of a firm's investment and financing decisions on the welfare of its security holders. *The American Economic Review*, *68*(3), 272–284. https://www.jstor.org/stable/1805260?seq=1

Farrell, M. J. (1957). The measurement of productive efficiency. *Journal of the Royal Statistical Society*, *120*(3), 253–290. http://goo.gl/AFhm2N

Gaio, L. E., Pimenta Júnior, T., Lima, F. G., Passos, I. C., & Stefanelli, N. O. (2018). Value-at-risk performance in emerging and developed countries. *International Journal of Managerial Finance*, *14*(5), 591–612. https://doi.org/10.1108/IJMF-10-2017-0244

Gan, V. B. Y. (2018). Two sides of the same coin insolvency risk measurement and capital adequacy rules for Basel III. *SSRN Electronic Journal*, *January 2017*, 1–37. https://doi.org/10.2139/ssrn.2948855

Gandhi, A. V., & Sharma, D. (2018). Technical efficiency of private sector hospitals in India using data envelopment analysis. *Benchmarking: An International Journal*, *25*(9), 3570–3591. https://doi.org/10.1108/BIJ-06-2017-0135

Hajering, M., Dani, I., & Su'un, M. (2018). The influence of investment decisions, funding decisions, and dividend policies on financial performance and the value of banking companies listed in the Indonesia Stock Exchange. *International Journal of Business and Management Invention (IJBMI)*, *7*(10), 63–71. http://www.ijbmi.org/papers/Vol(7)10/Version-1/G0710016371.pdf

Horvat, D., Stahlecker, T., Zenker, A., Lerch, C., & Mladineo, M. (2018). A conceptual approach to analyzing manufacturing companies' profiles concerning industry 4.0 in emerging economies. *28th International Conference on Flexible Automation and Intelligent Manufacturing (FAIM2018),* Columbus, OH, USA, June 11-14, 2018 (pp.419–426). https://doi.org/10.1016/j.promfg.2018.10.065

Iqbal, J., & Azher, S. (2014). Value-at-risk and expected stock returns: Evidence from Pakistan. *The Lahore Journal of Economics*, *19*(2), 71–100. https://doi.org/10.35536/lje.2014.v19.i2.a3

Jaiyeoba, H., Adewale, A., & Ibrahim, K. (2018). Measuring efficiencies of Bangladeshi and Indonesian microfinance institutions: A data envelopment analysis and latent growth curve modeling approach. *International Journal of Bank Marketing*, *36*(2), 305–321. http://irep.iium.edu.my/56333/

Jorion, P. (2001). *Value at risk the new benchmark for managing financial risk*. New York: McGraw-Hill Companies, Inc.

Jubaedah, J., Yulivan, I., & Abdul Hadi, A. R. (2016). The influence of financial performance, capital structure and macroeconomic factors on firm's value: Evidence from textile companies at Indonesia stock exchange. *Applied Finance and Accounting*, *2*(2), 18–29. https://doi.org/10.11114/afa.v2i2.1403

Juniar, A., & Fadah, I. (2019). Efficient financial management strategy for Indonesian health BPJS. *International Journal of Scientific and Technology Research*, *8*(7), 403–407. http://www.ijstr.org/final-print/july2019/Efficient-Financial-Management-Strategy-For-Indonesian-Health-Bpjs.pdf

Kavassalis, P., Stieber, H., Breymann, W., Saxton, K., Gross, F. J., & Joseph, F. (2017). An innovative regtech approach to financial risk monitoring and supervisory reporting. *The Journal of Risk Finance*, *19*(1), 39–55. https://doi.org/10.1108/JRF-07-2017-0111

Keliwon, K. B., Shukor, Z. A., & Hassan, M. S. (2018). Internet financial reporting (IFR) disclosure position and firm value. *Asian Journal of Accounting and Governance*, *9*, 111–121. https://doi.org/10.17576/ajag-2018-09-10

Khalil, S., & O'Sullivan, P. (2017). Corporate social responsibility: Internet social and environmental reporting by banks. *Meditari Accountancy Research*, *25*(3), 414–446. https://doi.org/10.1108/MEDAR-10-2016-0082

Khanifah, K., Hardiningsih, P., Darmaryantiko, A., Iryantik, I., & Udin, U. (2020). The effect of corporate governance disclosure on banking performance: Empirical evidence from Iran, Saudi Arabia, and Malaysia. *Journal of Asian Finance, Economics, and Business*, *7*(3), 41–51. https://doi.org/10.13106/jafeb.2020.vol7.no3.41

Kwateng, K. O., Wusu, O. E. E., & Amanor, K. (2019). Exploring the effect of online banking on bank performance using data envelopment analysis. *Benchmarking: An International Journal*, *27*(1), 137–165. http://jjmie.hu.edu.jo/vol13-1/jjmie_30_19-01.pdf

Lopez-Arceiz, F. J., Torres, L., & Bellostas, A. J. (2019). Is online disclosure the key to corporate governance? *Online Information Review*, *43*(5), 893–921. https://doi.org/10.1108/OIR-06-2018-0191

Majumder, M. T. H., & Li, X. (2018). Bank risk and performance in an emerging market setting: The case of Bangladesh. *Journal of Economics, Finance and Administrative Science*, *23*(46), 199–229. https://doi.org/10.1108/JEFAS-07-2017-0084

Maresova, P., Soukal, I., Svobodova, L., Hedvicakova, M., Javanmardi, E., Selamat, A., & Krejcar, O. (2018). Consequences of industry 4.0 in business and economics. *Economies*, *6*(3), 1–14. https://doi.org/10.3390/economies6030046

Markowitz, H. (1952). *Portfolio selection efficient diversification of investment*. New York: John Wiley & Sons.

Muchtar, D., Nor, F. M., Albra, W., Arifai, M., Ahmar, A. S., & Elgammal, M. M. (2018). The dynamic performance of Indonesian public companies : An analysis of financial decision behavior. *Cogent Economics & Finance*, *6*, 1–14. https://doi.org/10.1080/23322039.2018.1488343

Musallam, S. R. M. (2018). The direct and indirect effect of the existence of risk management on the relationship between the audit committee and corporate social responsibility disclosure. *Benchmarking: An International Journal*, *25*(9), 4125–4138. https://doi.org/10.1108/BIJ-03-2018-0050

Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance*, *39*(3), 575–592. https://doi.org/10.1111/j.1540-6261.1984.tb03646

Nanda, S. T., Zenita, R., Anita, R., & Abdillah, M. R. (2019). The role of the investment opportunity is set on a financially

distressed firm's value. *International Journal of Engineering & Technology*, *8*(1.8), 154–158. https://doi.org/10.14419/ijet.v8i1.8.26226

Nassar, S. (2016). The impact of capital structure on the financial performance of the firms : Evidence from Borsa Istanbul business. *Journal of Business & Financial Affairs*, *5*(2), 1–4. https://doi.org/10.4172/2167-0234.100017

Nguyen, H. T., & Nguyen, A. H. (2020). The impact of capital structure on firm performance: Evidence from Vietnam. *Journal of Asian Finance, Economics, and Business*, *7*(4), 97–105. https://doi.org/10.13106/JAFEB.2020.VOL7.NO4.97

Nguyen, P., & Nguyen, A. (2015). The effect of corporate social responsibility on firm risk. *Social Responsibility Journal*, *11*(2), 324–339. https://doi.org/10.1108/SRJ-08-2013-0093

Ofori-Sasu, D., Abor, J. Y., & Mensah, L. (2019). Funding structure and technical efficiency: A data envelopment analysis (DEA) approach for banks in Ghana. *International Journal of Managerial Finance*, *15*(4), 425–443. https://doi.org/10.1108/IJMF-01-2018-0003

Olowookere, T., & Agbesanya, E. O. (2018). Effect of internet financial reporting on stock prices and a dividend yield of quoted non-financial companies in Nigeria. *Research Journal of Finance and Accounting*, *9*(8), 120–129. https://iiste.org/Journals/index.php/RJFA/article/view/42018

Omran, M. A., & Ramdhony, D. (2016). Determinants of Internet financial reporting in African markets: The case of Mauritius. *The Journal of Developing Areas*, *50*(4), 1–18. https://doi.org/10.1353/jda.2016.0150

Ross, S. A. (1977). The determination of financial structure: the incentive-signaling approach. *The Bell Journal of Economics*, *8*(1), 23–40. https://doi.org/10.2469/dig.v27.n1.2

Roy, A. D. (1952). Safety first and the holding of assets. *Econometrica*, *20*(3), 431–449. https://doi.org/10.1177/002795018109800105

Saksonova, S. (2014). The role of net interest margin in improving banks' asset structure and assessing the stability and efficiency of their operations. *Procedia - Social and Behavioral Sciences*, *150*, 132–141. https://doi.org/10.1016/j.sbspro.2014.09.017

Sari, E., Suhadak, S., Rahayu, S. M., & Solimun. (2018). The effects of Tier-1 capital, risk management, and profitability on the performance of Indonesian commercial banks. *International Journal of Law and Management*, *60*(5), 1074–1086. https://doi.org/10.1108/IJLMA-05-2017-0109

Sawik, B. T. (2012). Conditional value-at-risk vs. value-at-risk to multi-objective portfolio optimization. *Applications of Management Science*, *15*, 277–305. https://doi.org/10.1108/s0276-897620140000017019

Senol, Z., Karaca, S. S., & Erdogan, S. (2017). The effects of financial risk management on firm's value: An empirical evidence from Borsa Istanbul stock exchange. *Financial Studies*, *4*, 27–45. ftp://www.ipe.ro/RePEc/vls/vls_pdf/vol21i4p27-45.pdf

Shahwan, Y. (2018). The mediating effect of investment decisions and financing decisions on the influence of capital structure against corporate performance: Evidence from Jordanian listed commercial banks. *Academy of Accounting and Financial Studies Journal*, *22*(6), 1–20.

Sia, C. J., Brahmana, R., & Memarista, G. (2018). Corporate Internet reporting and firm performance: Evidence from Malaysia. *Contemporary Economics*, *12*(2), 153–164. https://doi.org/10.5709/ce.1897-9254.269

Sucuahi, W., & Cambarihan, J. M. (2016). Influence of profitability on the firm value of diversified companies in the Philippines. *Accounting and Finance Research*, *5*(2), 149–153. https://doi.org/10.5430/afr.v5n2p149

Sudiyatno, B., Puspitasari, E., & Sudarsi, S. (2017). Working capital, firm performance, and firm value: An empirical study in the manufacturing industry on the Indonesia stock exchange. *Economics World*, *5*(5), 444–450. https://doi.org/10.17265/2328-7144/2017.05.007

Sullivan, E. J. (2008). A.D. Roy: The forgotten father of portfolio theory. *Northeastern Association of Business, Economics, and Technology Proceedings*, 255–260. https://doi.org/10.1108/s0743-4154(2011)000029a008

Sumani, S., & Suryaningsih, I. B. (2020). Intellectual capital, capital structure, and growth of the company and its implications on value index formers LQ-45. *International Journal of Scientific and Technology Research*, *9*(1), 4182–4189. https:// doi.org/10.31838/jcr.07.15.40

Tabash, M. I. (2019). An empirical investigation on the relation between disclosure and financial performance of Islamic banks in the United Arab Emirates. *Journal of Asian Finance, Economics, and Business*, *6*(4), 27–35. https://doi.org/10.13106/jafeb.2019.vol6.no4.27

Tandiontong, M., & Rusdin. (2015). Funding policy, investment policy, and the implication to company's value. *Australian Journal of Basic and Applied Sciences*, *9*(37), 57–64. https://repository.maranatha.edu/22802/

Taylor, F. W. (1911). *The principles of scientific management*. New York, NY: Harper and Brothers Publisher.

Teymouri, M., & Ashoori, M. (2011). The impact of information technology on risk management. *Procedia Computer Science*, *3*, 1602–1608. https://doi.org/10.1016/j.procs.2011.01.056

Treynor, J. L. (1962). Toward a theory of market value of risky assets. *Journal of Investment Management*, *1*(2), 6072–6091. https://faculty.fuqua.duke.edu/~charvey/Teaching/BA453_2006/French_Treynor_CAPM.pdf

Tupa, J., Simota, J., & Steiner, F. (2017). Aspects of risk management implementation for industry 4.0. *Procedia Manufacturing, 11,* 1223–1230. https://doi.org/10.1016/j.promfg.2017.07.248

Veeraraghavan, K. (2018). Effect of financial management practices on the financial performance of small and medium enterprises in Puducherry, India. *International Journal of Management Studies*, *V*(4), 51–63.

Vikas, & Bansal, R. (2019). Efficiency Evaluation of Indian Oil and Gas Sector: Data Envelopment Analysis. *International Journal of Emerging Markets*, *14*(2), 362–378. https://doi.org/10.1108/IJoEM-01-2018-0016