

## How to Cite

Inrico, I., Sulastrri, S., & Malinda, S. (2023). The effect of working capital management and intellectual capital on firm performance in food and beverages industry listed in Indonesia stock exchange. *International Journal of Business, Economics & Management*, 6(3), 223-246. <https://doi.org/10.21744/ijbem.v6n3.2152>

# The Effect of Working Capital Management and Intellectual Capital on Firm Performance in Food and Beverages Industry Listed in Indonesia Stock Exchange

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**Abstract---***The aim of this study is to analyze the impact of working capital management and intellectual capital on the performance of food and beverage companies listed on the Indonesia Stock Exchange (IDX) before and during the COVID-19 pandemic. This study utilizes panel data consisting of financial information from 21 sample companies in the food and beverage sector obtained from the official website of the Indonesia Stock Exchange from 2017 to 2022. The analysis method employed is panel data regression analysis using the statistical software Stata 17. The measurement of firm performance includes profitability ratios proxied by return on assets (ROA) and return on equity (ROE), while firm value is proxied by Tobin's Q. The measurement for the working capital management (WCM) variables consists of days of inventory outstanding (DIO), days of sales outstanding (DSO), and days of payable outstanding (DPO). On the other hand, the measurement for the intellectual capital (IC) variables consists of human capital efficiency (HCE), structural capital efficiency (SCE), and capital employed efficiency (CEE).*

**Keywords---***firm performance, firm value, human capital efficiency (HCE), intellectual capital (IC), return on assets (ROA), return on equity (ROE), working capital management (WCM).*

## Introduction

Business performance concerning profitability or market value is the output of a variety of financial decisions taken by a company (Aras & Mutlu Yildirim, 2018). Financial decisions make projections related to finances in the short and long term very important. This estimate must be based on proper financial planning so that the company does not choose excessive investment or vice versa. In financial planning, working capital management (WCM) serves as a basis for making decisions regarding the fulfillment of company costs related to operations and its short-term financial obligations (Ukaegbu, 2014). Therefore, the company's operational capability is also determined by working capital which is managed properly.

Efficient working capital management is an important area that can be improved through managerial efficiency (Prasad et al., 2019; Prasad et al., 2019). Working capital management (WCM) is concerned with the company's management of receivables, inventories, and accounts payable that affect company value and profitability (Le, 2019).

In management science, there are POAC principles, namely planning, organizing, actuating, and controlling (POAC). POAC is the de facto international standard that has been universally accepted as the theory behind the successful implementation of project management and implementation (Sudaryono et al., 2020). In working capital management, (1) planning includes projecting the company's short-term cash needs which helps the company to identify potential cash shortages and plan the necessary funding sources. Working capital management is related to current assets and current liabilities which are an important part of the company's total assets. Maintaining an increased level of current assets leads a company to achieve an unfavorable return on its total short-term investment (Aldubhani et al., 2022). (2) Organizing includes managing the company's short-term assets and liabilities, such as cash, inventories, accounts receivable, and accounts payable to ensure that the company has sufficient working capital to meet its financial obligations. Nguyen et al. (2020), stated that relatively few current assets would make the company vulnerable to difficulties and problems, perhaps a rapid failure in managing the company's operations, reducing the company's ability to meet its short-term needs. Financial obligations, and increase the company's exposure to liquidity risk. Therefore, establishing a reasonable working capital policy will allow the company to increase profitability and create value for investors (Phuong & Hung, 2020). (3) Actuating includes tracking inventory levels and monitoring billing and payment processes to ensure that operations run efficiently. This management relates to the period required to purchase and produce raw materials and store them in stock, then sell the stock and collect the resulting cash or convert debtors' bills into cash depending on the job situation and type of product (Ghosh & Mondal, 2009). (4) Controlling involves monitoring and evaluating the company's working capital position and making necessary adjustments to ensure it remains stable and meets the company's needs. (Knauer & Wöhrmann, 2013), states that WCM is an important determinant in the success of a company because it has an impact on future sales and profits. Different WCM measures are often applied internally in companies to analyze operating performance because they have an impact on firm value (Kieschnick et al., 2013).

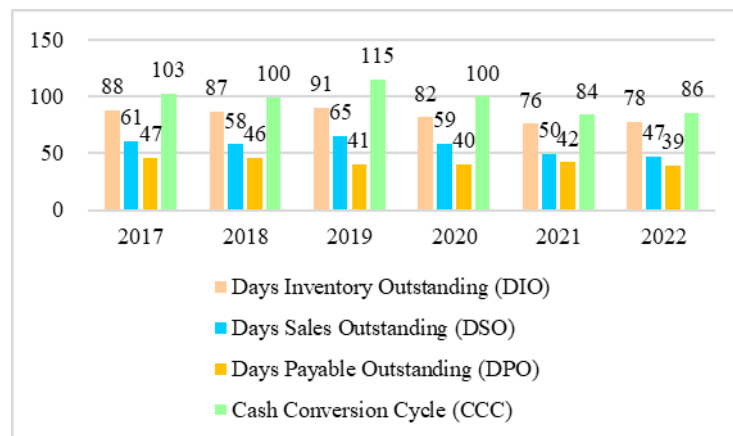


Figure 1. DIO, DSO, DPO and CCC Year 2017-2022

Source: Data processed by researchers, 2023

In the food and beverage industry, effective working capital management has a significant impact on performance and financial stability because the industry has high levels of inventories and receivables, as well as significant amounts of debt. Working capital management (WCM) has an important role, especially in the performance of manufacturing companies (Karaduman et al., 2010). Richards & Laughlin (1980), in theory state that effective working capital management can be achieved through analysis and calculation of inventory level management, optimizing the timing of payments to suppliers and collecting payments from customers, as well as implementing efficient financing and investment strategies. Conversely, improper management hurts the company's financial performance because WCM acts as a buffer for the company's liquidity (Baños-Caballero et al., 2020). The company's liquidity assessment is important because a decrease in liquidity causes a greater risk of bankruptcy (Kamau & Ayuo, 2014). Working capital management can provide the right level of liquidity to enable the company to cover short-term financial obligations resulting from operating financing to ensure the continuity of the company's business and maximize its profitability (Aldubhani et al., 2022).

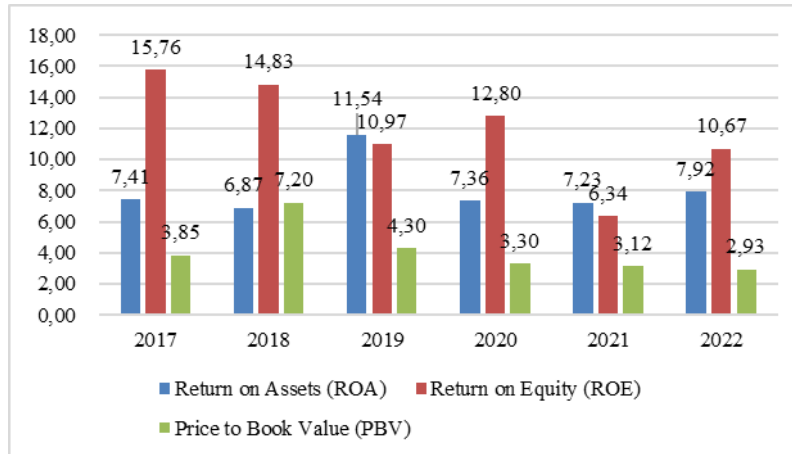


Figure 2. ROA, ROE, and PBV 2017-2022  
Source: Data processed by researchers, 2023

Figure 2 shows that ROA, ROE, and PBV in the food and beverage industry from 2017 to 2019 tend to be stable. However, in 2020 it can be seen that there has been a significant decrease in ROA from 11.54 to 7.36. Meanwhile, ROE and PBV did not experience a significant decrease. The decline in ROA in 2020 was caused by the COVID-19 pandemic that hit. The Organization for Economic Co-operation and Development (2020) explains that the COVID-19 pandemic has put unprecedented pressure on the food supply chain, with labor, processing, transportation, and logistics bottlenecks, as well as significant changes in demand. COVID-19 has caused drastic changes in consumer demand for restaurants, food services, and types of consumption. Based on data released by the Organization for Economic Co-operation and Development (2020), when the COVID-19 pandemic hit, sales of consumer food in places such as hotels, restaurants, catering, and cafes experienced a significant decline. At the same time, retail demand for frozen and packaged foods has increased significantly (OECD, 2020).

Turovets (2021), in his research stated that working capital management is one of many approaches that use tangible assets as a proxy for company performance and concluded that only a few studies have explored intangible assets as a predictor of company efficiency. Based on the Resource-based theory, companies gain competitive advantage and superior performance through acquisitions using strategic assets (Wernerfelt, 1984). Strategic assets are tangible assets and intangible assets. Mouritsen et al. (2005), states that most intangible assets do not qualify as strategic assets, but intellectual capital is considered a vital strategic asset. What is meant by intellectual capital is special and valuable knowledge owned by the organization. Intellectual capital can be seen as a mix of human capital, structural capital, and customer capital. Thus, intellectual capital in the form of knowledge is the main driver of a company's capability and growth (Michalisin et al., 1970), which determines how those resources are deployed to produce new products and services (Amit & Schoemaker, 1993).

Azamat et al. (2023), in their research on 90 fast-moving consumer goods (FMCG) companies around the world in 2018-2020 stated that the majority of FMCG companies were undervalued in terms of the value of intangible assets by comparing the market value of these intangible assets. to its fundamental and theoretical value. The importance of intangible assets as a factor in the growth of company value explains the need for management to develop mechanisms to involve the rational use of intangible assets, taking into account the properties of its components so that they can have a significant impact on the company value. (Azamat et al., 2023). This relationship is less investigated in the case of food and beverage industry companies because the approaches and research models used tend to be based on tangible assets and are not comprehensive with the use of intangible assets related to theory and practice for the food and beverage sector.

This study implements the Resource-based Theory which states that company resources, both tangible and intangible, can increase efficiency and effectiveness which have an impact on company performance. Research conducted by Jabbouri et al. (2022); Sawarni et al. (2020), shows that working capital management has a positive and significant effect on firm performance. Furthermore, research conducted by Xu & Li (2020), shows that intellectual capital influences firm performance. This study aims to complement and clarify previous research by re-examining the effect of working capital management and intellectual capital on firm performance. In other words, This research wants to prove that the management of tangible assets through working capital management and intangible assets through intellectual capital has equal interests in realizing optimal company performance. This

research also comprehensively measures and analyzes firm performance in terms of financial performance and firm value in 2 (two) conditions, namely the conditions before COVID-19 from 2017-2019 and the model during COVID-19 from 2020-2022.

#### *Literature review*

##### *Working Capital Management (WCM) to Return on Assets (ROA) and Return on Equity (ROE)*

The main goal of working capital management is to maintain the company's ability to carry out day-to-day operations and meet its short-term financial obligations (Yilmaz, 2015). Monitoring is critical to guaranteeing optimal levels of liquidity and ensuring smooth day-to-day operations while enhancing company performance and value (Jabbouri et al., 2022).

Previous research by Gołaś (2020), examined WCM with the CCC proxy for company performance, in this case, ROA at dairy companies in Poland in 2008-2017, showing that a negative relationship was found between CCC and ROA. This suggests that speeding up inventory turnover and collection of accounts receivable from customers has a beneficial impact on the performance of dairies in Poland. Furthermore, previous research by Linh & Mohanlingam (2018), who conducted WCM research with the CCC matrix on company performance in this case ROA and ROE in agricultural and food companies in 2009-2013 in Thailand showed that CCC had a significant negative relationship with ROA in companies agriculture and food in Thailand, while CCC has a positive relationship with ROE. On the contrary, Ikechukwu & Nwakaego (2016), report that CCC has an insignificant impact on company profitability. A 10 (ten) year study of vehicle tire companies in India by Hemalatha & Kamalavalli (2017), concluded that CCC has no significant relationship with ROE and ROA.

Although many studies have reported a correlation between CCC and profitability, the results are mixed and not conclusive. Given these inconsistent findings, it is important to examine the relationship between CCC and profitability to see if it is positive, negative, or neutral, especially for a given industry. In theory, if a company could sell inventory, collect money from customers quickly, and delay paying suppliers, it would save costs and increase profits as a result. Thus, the hypothesis is as follows:

*H1: Days of inventory outstanding (DIO) affect the Return on Assets (ROA).*

*H2: Days of outstanding sales (DSO) affect the Return on Assets (ROA).*

*H3: Days of payable outstanding (DPO) affect the Return on Assets (ROA).*

*H4: Days of inventory outstanding (DIO) affect Return on Equity (ROE).*

*H5: Days of outstanding sales (DSO) affect Return on Equity (ROE).*

*H6: Days of payable outstanding (DPO) affect Return on Equity (ROE).*

##### *Working Capital Management (WCM) towards Firm Value*

Previous research by Vijayakumaran (2019), concluded that CCC had a negative relationship with company value on the China Stock Exchange in 2004-2013. In-depth, this study found that firm value is negatively affected by the number of days receivable and inventory, indicating that working capital provides a real opportunity for financial management to increase firm value. The findings of this study are consistent with the notion that management can increase firm value by reducing the net trading cycle to a relevant minimum level. In other words, financial markets give a higher valuation to companies that manage their working capital more efficiently. Thus, the hypothesis is as follows:

*H7: Days of inventory outstanding (DIO) affect Firm Value.*

*H8: Days of sales outstanding (DSO) affect Firm Value.*

*H9: Days of payable outstanding (DPO) affect Firm Value.*

##### *Intellectual Capital (IC) to Return on Assets (ROA) and Return on Equity (ROE)*

*Intellectual capital* assists in achieving competitive advantage and adding value to the company, which directly and indirectly improves its financial performance (Weqar et al., 2021). Pulic (2000), supports the view of Wernerfelt's (1984), Resource-based theory that to achieve competitive advantage and value addition, all types of resources (tangible and intangible) are prerequisites. By following the Resource-based theory by Wernerfelt (1984), it is hoped that there will be a significant relationship between intellectual capital and company performance.

Maditinos et al. (2011), conducted a study on 96 Greek companies and reported that SCE, CEE, and VAIC had insignificant impacts on ROA and ROE. However, only HCE showed a significant positive effect on ROE. In contrast, Joshi et al. (2013), proved that CEE is the most significant element in increasing ROA in financial companies in Australia while HCE, SCE, and VAIC are not significant to it. A study on banks from the Gulf Cooperation Council by Al-Musali & Ku Ismail (2016), shows that VAIC positively affects ROA and ROE. Similarly, research conducted by Mohammed & Irbo (2018), concluded that VAIC and all of its components help in increasing the ROA of banks in Ethiopia. Nadeem et al. (2018), analyzed VAIC in five developing and five developed countries in the world and concluded that HCE, and CEE had a strong positive influence on ROA and ROE. In contrast, research conducted by (Wiig, 1997; Baños-Caballero et al., 2014; Boisjoly et al., 2020), on 109 companies listed on the Indonesia Stock Exchange in 2013 concluded that HCE had a positive influence on ROE but not SCE and CCE. Thus, the hypothesis is as follows:

*H10: Human capital efficiency (HCE) affects the Return on Assets (ROA).*

*H11: Structural capital efficiency (SCE) affects Return on Assets (ROA).*

*H12: Capital employed efficiency (CEE) affects the Return on Assets (ROA).*

*H13: Human capital efficiency (HCE) affects Return on Equity (ROE).*

*H14: Structural capital efficiency (SCE) to Return on Equity (ROE).*

*H15: Capital employed efficiency (CEE) affects Return on Equity (ROE).*

#### *Intellectual Capital (IC) towards Firm Value*

In recent years, the impact of intellectual capital on firm performance has been studied by many researchers. Sydlar et al. (2014), show that increased intellectual capital is associated with a higher return on assets over time. Zeghal & Maaloul (2010), found that intellectual capital has a positive impact on the economic and financial performance of companies. In addition, Hejazi et al. (2016), found that intellectual capital is positively related to Tobins'Q and has an effect on improving company performance. Furthermore, Abualoush et al. (2018), revealed that intellectual capital is related to knowledge management processes and organizational performance. In short, intellectual capital which is commonly referred to as intangible assets is recognized as a strong driver of corporate value (Wingren, 2004), and related to the company's financial performance significantly and positively (Amin & Aslam, 2017).

On the other hand, some researchers describe different results. Maditinos et al. (2011), cannot prove the hypothesis that companies with higher intellectual capital will have a higher level of market value at book value. Hang Chan (2009), argues that there is no conclusive evidence supporting a definitive relationship between intellectual capital and financial performance for the firms surveyed in Hong Kong. Ghosh & Mondal (2009), found that Indian investors were not influenced by the intellectual capital performance of firms and there was no direct relationship between productivity and intellectual capital performance. In addition, Wang & Chang (2005), found that human resources did not directly affect business performance. Rizkhyana et al. (2022), in their research on 88 companies included in the LQ45 index category for 2017-2020 also concluded that intellectual capital does not affect firm value. Furthermore, Putri et al. (2020), in their research on 101 companies listed on the Indonesia Stock Exchange in 2012-2016 concluded that human capital has a positive and significant effect on firm value, while structural capital and customer capital do not affect firm value. Thus, the hypothesis is as follows: (2018) in their research on 101 companies listed on the Indonesia Stock Exchange in 2012-2016 concluded that human capital has a positive and significant effect on company value, while structural capital and customer capital do not affect company value. Thus, the hypothesis is as follows: (2018) in their research on 101 companies listed on the Indonesia Stock Exchange in 2012-2016 concluded that human capital has a positive and significant effect on company value, while structural capital and customer capital do not affect company value. Thus, the hypothesis is as follows:

*H16: Human capital efficiency (HCE) affects Firm Value.*

*H17: Structural capital efficiency (SCE) affects Firm Value.*

*H18: Capital employed efficiency (CEE) affects Firm Value.*

#### **Method**

In this study, there are 2 (two) independent variables, namely Working Capital Management (X1) and Intellectual Capital (X2). While the dependent variable is Firm Performance (Y). Researchers limit the p measurement of working capital management (WCM) variables consisting of days of inventory outstanding (DIO), days of sales

outstanding (DSO), and days of payable outstanding (DPO). Measurement of intellectual capital (IC) variables consists of human capital efficiency (HCE), structural capital efficiency (SCE), and capital employed efficiency (CEE). Measurement of company performance consists of profitability ratios proxied by return on assets (ROA) and return on equity (ROE), while company value is proxied by Tobin's Q.

This research uses secondary data, namely financial data of food and beverage manufacturing companies for 6 (six) periods, namely 2017-2022. Research is classified in 2 (two) different times, namely before COVID-19 (2017-2019) and during COVID-19 (2020-2022). The scope of this research is manufacturing companies in the food and beverage sector which are listed on the Indonesia Stock Exchange for 6 (six) periods, namely 2017-2022. In this study, the population was manufacturing companies in the food and beverage sector that were listed on the Indonesia Stock Exchange for the period 2017 to 2022. The sample in this study used a purposive sampling method with the following criteria:

- a) Food and beverage sector companies listed on the IDX from 2017-2022.
- b) The company did not experience delisting during the study period.
- c) The company has complete financial data from 2017-2022.

By using the data aggregation method, the data obtained in this study amounted to 21 companies x 6 years = 126 observational data. The company data used as samples are as follows:

Table 1  
Research Sample

No.	Issuer Code	Issuer Name	IPO date
1	ADES	Akasha Wira International Tbk.	13/06/1994
2	AISA	FKS Food Sejahtera Tbk.	11/06/1997
3	ALTO	Tri Banyan Tirta Tbk.	10/07/2012
4	BTEK	Superior Technoculture Earth Tbk.	14/05/2004
5	BUDI	Budi Starch & Sweetener Tbk.	08/05/1995
6	CAMP	Campina Ice Cream Industry Tbk.	19/12/2017
7	CHECK	Wilmar Cahaya Indonesia Tbk.	09/07/1996
8	CLEO	Sariguna Primatirta Tbk.	05/05/2017
9	DLTA	Delta Djakarta Tbk.	02/27/1984
10	HOCKEY	Buyung Poetra Sembada Tbk.	22/06/2017
11	ICBP	Indofood CBP Sukses Makmur Tbk.	07/10/2010
12	INDF	Indofood Sukses Makmur Tbk.	14/07/1994
13	MLBI	Multi Bintang Indonesia Tbk.	17/01/1994
14	MYOR	Mayora Indah Tbk.	04/07/1990
15	PCAR	Prima Cakrawala Abadi Tbk.	29/12/2017
16	PSDN	Prasidha Aneka Niaga Tbk.	18/10/1994
17	BREAD	Nippon Indosari Corpindo Tbk.	28/06/2010
18	SKBM	Sekar Bumi Tbk.	05/01/1993
19	SKLT	Sekar Laut Tbk.	08/09/1993
20	STTP	Siantar Top Tbk.	16/12/1996
21	ULTJ	Ultra Jaya Milk Industry Tbk.	02/07/1990

Source: Indonesia Stock Exchange, [www.idx.co.id](http://www.idx.co.id)

This research is a panel data type with secondary data used as a data source for this research based on information obtained from the website [www.idx.co.id](http://www.idx.co.id). In this research, the method used for data collection is a documentation study obtained from collecting secondary data on the financial reports of beverage and food companies for 6 (five) periods, namely 2017-2022 which were published by the Indonesia Stock Exchange. As for other supporting data related to research was obtained through the internet and literature.

In this research, panel data regression is used as a data analysis model that aims to analyze, partially or simultaneously, the effect of working capital management and intellectual capital on firm performance in manufacturing companies engaged in the food and beverage sector which are listed on the Indonesia Stock Exchange. The data analysis technique in this study used Stata 17 statistical measurement tools. Researchers use

descriptive statistical analysis to collect and present data in detail and easier to understand. This is to the statement of Ghozali (2017), that descriptive statistical analysis provides an overview or description of data seen from the mean value, standard deviation, variance, maximum, and minimum.

## Results and Discussion

### Results

#### *Descriptive statistical analysis*

Descriptive statistical analysis is used to determine the description of data seen from the maximum value, minimum value, average value, and standard deviation value. In this study, the variables used in the calculation of descriptive statistics are days of outstanding inventory coded as DIO, days of outstanding sales coded as DSO, days of payable outstanding coded as DPO, human capital efficiency coded as HCE, and structural capital efficiency is coded as SCE, and capital employed efficiency is coded CEE. Based on the descriptive statistical analysis, the sample description is obtained as follows:

Table 2  
Descriptive statistics

	Variables	Means	std. dev	Min	Max
Before COVID-19 (2017-2019)	DIO	88.60753	81.56531	.5299992	352.1927
	DSO	61.6112	39.03539	21.40589	284.9492
	DPO	44.3481	35.2479	.403924	204.6068
	HCE	2.546999	1.997029	-1.182877	7.492576
	SCE	.5725423	.6716062	-1.519687	3.110346
	CEE	.5234242	.7077948	-.078837	3.784006
	ROA	8.607508	13.01808	-9.705843	60.71678
	ROE	13.85416	28.0401	-68.49191	124.1991
	TQ	3.444376	6.931044	.5253071	53.40191
During COVID-19 (2017-2020)	DIO	78.67634	63.66236	20.99191	378.7837
	DSO	51.83782	27.42789	.0234844	186.2319
	DPO	40.57974	29.70391	.686054	132.5221
	HCE	2.139274	3.235402	-15.98068	6.84425
	SCE	.2222375	3.455467	-26.50106	2.927619
	CEE	.398133	.3997607	-.3379289	1.988809
	ROA	7.502823	10.67971	-15.44056	59.90245
	ROE	9.938397	32.84382	-148.0229	141.5749
	TQ	2.139066	1.568197	.5508669	7.536538

Source: Stata 17 software processing results

- The average value of DIO is 78.67, while the standard deviation value of DIO is 63.66. These results indicate that during the COVID-19 conditions, food and beverage companies had a standard deviation that was smaller than the average, indicating a small distribution of data variables or no significant gaps from the DIO data.
- The average value of the DSO is 51.83, while the standard deviation value of the DSO is 27.42. These results indicate that during COVID-19 conditions, food and beverage companies had a standard deviation that was smaller than the average, indicating a small distribution of data variables or no significant gaps from the DSO data.
- The average value of the DPO is 40.57, while the standard deviation value of the DPO is 29.70. These results indicate that during the COVID-19 conditions, food and beverage companies had a standard deviation that was smaller than the average, indicating a small distribution of data variables or no significant gaps from the DPO data.

- d) The average value of HCE is 2.13, while the standard deviation value of HCE is 3.23. These results indicate that during the COVID-19 conditions, food and beverage companies had a standard deviation that was greater than the average indicating a large distribution of data variables or a sizable gap from the HCE data.
- e) The average value of SCE is 0.22, while the standard deviation value of SCE is 3.45. These results indicate that during the COVID-19 conditions, food and beverage companies had a standard deviation that was greater than the average indicating a large distribution of data variables or a sizable gap from the SCE data.
- f) The average value of CEE is 0.398, while the standard deviation value of CEE is 0.399. These results indicate that during the COVID-19 conditions, food and beverage companies had a standard deviation that was greater than the average indicating a large distribution of data variables or a sizable gap from the CEE data.
- g) The average value of ROA is 7.50, while the standard deviation value of ROA is 10.67. These results indicate that during the COVID-19 conditions, food and beverage companies had a standard deviation that was greater than the average indicating a large distribution of data variables or a sizable gap from the ROA data.
- h) The average value of ROE is 9.93, while the standard deviation value of ROE is 32.84. These results indicate that during the COVID-19 conditions, food and beverage companies had a standard deviation that was greater than the average indicating a large distribution of data variables or a sizable gap from the ROE data.
- i) The average value of TQ is 2.13, while the standard deviation value of TQ is 1.56. These results indicate that during the COVID-19 conditions, food and beverage companies had a standard deviation that was smaller than the average, indicating a small distribution of data variables or no significant gaps from the TQ data.

#### Panel data regression model estimation

According to [Basuki & Yuliadi \(2015\)](#), in analyzing the panel data model three approaches can be used, namely the ordinary least square or common effect, the fixed effect approach, and the random effect. Following are the results of the regression estimation test of the three equations into the three regression models before COVID-19 and after COVID-19:

1.  $ROA = \alpha_0 + \beta_1 DIO + \beta_2 DSO + \beta_3 DPO + \beta_4 HCE + \beta_5 SCE + \beta_6 CEE + \varepsilon$
2.  $ROE = \alpha_0 + \beta_1 DIO + \beta_2 DSO + \beta_3 DPO + \beta_4 HCE + \beta_5 SCE + \beta_6 CEE + \varepsilon$
3.  $Firm\ Value = \alpha_0 + \beta_1 DIO + \beta_2 DSO + \beta_3 DPO + \beta_4 HCE + \beta_5 SCE + \beta_6 CEE + \varepsilon$

#### Common effects model

Table 3  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROA

	Variables	coefficient	Prob. t	R <sup>2</sup>	Prob. F
Before COVID-19 (2017-2019)	DIO	-.0252756	0.124	0.5841	0.0000
	DSO	-.0218283	0.467		
	DPO	.1086178	0.005		
	HCE	3.864051	0.000		
	SCE	7.558774	0.000		
	CEE	.1651245	0.921		
During COVID-19 (2020-2022)	DIO	.0088457	0.545	0.6717	0.0000
	DSO	-.0431425	0.185		
	DPO	.0361691	0.295		
	HCE	1.624808	0.000		
	SCE	1.993208	0.000		
	CEE	1.110931	0.623		



Table 4  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROE

	<i>Variables</i>	<i>coefficient</i>	<i>Prob. t</i>	<i>R<sup>2</sup></i>	<i>Prob. F</i>
Before COVID-19 (2017-2019)	DIO	-.0111566	0.682	0.7497	0.0000
	DSO	.0373728	0.456		
	DPO	.075477	0.234		
	HCE	9.565023	0.000		
	SCE	7.455802	0.012		
	CEE	17.31216	0.001		
During COVID-19 (2020-2022)	DIO	-.0463636	0.384	0.5416	0.0000
	DSO	-.0463636	0.674		
	DPO	.2373783	0.061		
	HCE	4.504988	0.000		
	SCE	4.167694	0.000		
	CEE	-20.6543	0.014		

Table 5  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on Firm Value

	<i>Variables</i>	<i>coefficient</i>	<i>Prob. t</i>	<i>R<sup>2</sup></i>	<i>Prob. F</i>
Before COVID-19 (2017-2019)	DIO	-.0065366	0.582	0.2205	0.0252
	DSO	.0437324	0.049		
	DPO	-.0307233	0.267		
	HCE	.4218231	0.337		
	SCE	3.807315	0.003		
	CEE	.0973964	0.936		
During COVID-19 (2020-2022)	DIO	-.0016062	0.631	0.2039	0.0398
	DSO	.0233225	0.002		
	DPO	.0123851	0.119		
	HCE	.0152485	0.808		
	SCE	.0749918	0.243		
	CEE	.8827334	0.091		

*Fixed effects model*

Table 6  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROA

	<i>Variables</i>	<i>coefficient</i>	<i>Prob. t</i>	<i>R<sup>2</sup></i>	<i>Prob. F</i>
Before COVID-19 (2017-2019)	DIO	-.0256942	0.122	0.5838	0.6585
	DSO	-.0239845	0.432		
	DPO	.1113524	0.005		
	HCE	3.833182	0.000		
	SCE	7.297783	0.000		
	CEE	.0372126	0.983		
During COVID-19 (2020-2022)	DIO	.0091568	0.538	0.6715	0.8410
	DSO	-.0404247	0.225		
	DPO	.0352253	0.317		
	HCE	1.608739	0.000		
	Sc	2.014797	0.000		
	CEE	1.246805	0.589		

Table 7  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROE

	<i>Variables</i>	<i>coefficient</i>	<i>Prob. t</i>	<i>R<sup>2</sup></i>	<i>Prob. F</i>
Before COVID-19 (2017-2019)	DIO	-.0107417	0.697	0.7497	0.08518
	DSO	.0387471	0.449		
	DPO	.0729967	0.259		
	HCE	9.59334	0.000		
	SCE	7.317173	0.018		
	CEE	17.14119	0.000		
During COVID-19 (2020-2022)	DIO	-.0485788	0.368	0.5415	0.6524
	DSO	.0521903	0.663		
	DPO	.2442489	0.058		
	HCE	4.504155	0.000		
	SCE	4.120209	0.000		
	CEE	21.40309	0.013		

Table 8  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on Firm Value

	<i>Variables</i>	<i>coefficient</i>	<i>Prob. t</i>	<i>R<sup>2</sup></i>	<i>Prob. F</i>
Before COVID-19 (2017-2019)	DIO	-.0066507	0.579	0.2203	0.6113
	DSO	.044759	0.047		
	DPO	-.0304653	0.277		
	HCE	.4182396	0.346		
	SCE	3.624413	0.007		
	CEE	.0899293	0.942		
During COVID-19 (2020-2022)	DIO	-.0017366	0.607	0.2026	0.6119
	DSO	.0222717	0.004		
	DPO	.0127814	0.113		
	HCE	.0215254	0.736		
	SCE	.0836193	0.204		
	CEE	.9328424	0.079		

*Random effects model*

Table 9  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROA

	<i>Variables</i>	<i>coefficient</i>	<i>Prob. t</i>	<i>R<sup>2</sup></i>	<i>Prob. F</i>
Before COVID-19 (2017-2019)	DIO	-.0252756	0.119	0.5841	0.0000
	DSO	-.0218283	0.464		
	DPO	.1086178	0.004		
	HCE	3.864051	0.000		
	SCE	7.558774	0.000		
	CEE	.1651245	0.921		
During COVID-19 (2020-2022)	DIO	.0088457	0.543	0.6717	0.0000
	DSO	-.0431425	0.179		
	DPO	.0361691	0.291		
	HCE	1.624808	0.000		
	SCE	-1.993208	0.000		
	CEE	-1.110931	0.621		

Table 10  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROE

	<i>Variables</i>	<i>coefficient</i>	<i>Prob. t</i>	<i>R<sup>2</sup></i>	<i>Prob. F</i>
Before COVID-19 (2017-2019)	DIO	-.0111566	0.680	0.7497	0.0000
	DSO	.0373728	0.453		
	DPO	.075477	0.229		
	HCE	9.565023	0.000		
	SCE	7.455802	0.009		
	CEE	17.31216	0.000		
During COVID-19 (2020-2022)	DIO	-.0463636	0.380	0.5416	0.0000
	DSO	.0493494	0.672		
	DPO	.2373783	0.056		
	HCE	4.504988	0.000		
	SCE	4.167694	0.000		
	CEE	-20.6543	0.011		

Table 11  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on Firm Value

	<i>Variables</i>	<i>coefficient</i>	<i>Prob. t</i>	<i>R<sup>2</sup></i>	<i>Prob. F</i>
Before COVID-19 (2017-2019)	DIO	-.0065366	0.580	0.2205	0.0147
	DSO	.0437324	0.044		
	DPO	-.0307233	0.262		
	HCE	.4218231	0.332		
	SCE	3.807315	0.002		
	CEE	.0973964	0.936		
During COVID-19 (2020-2022)	DIO	-.0016062	0.629	0.2039	0.0260
	DSO	.0233225	0.001		
	DPO	.0123851	0.114		
	HCE	.0152485	0.807		
	SCE	.0749918	0.238		
	CEE	.8827334	0.085		

*Panel data regression model test*

To determine whether the common effect or fixed effect model is used, it is tested using the Chow test. Meanwhile, to determine whether the model that should be used is between fixed effects or random effects, it is necessary to test using the Hausman Test. The following are the results of testing the regression model:

*Chow test*

Table 12  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROA

Before COVID-19 (2017-2019)		During COVID-19 (2020-2022)	
<i>Test Summary</i>	<i>Prob</i>	<i>Test Summary</i>	<i>Prob</i>
F(2.54) = 0.42	0.6585	F(2.54) = 0.17	0.8410

Source: Stata 17 software processing results

Based on the Chow Test on the regression equation of working capital management (WCM) and intellectual capital (IC) on Return on Assets (ROA) in conditions before COVID-19 shows a probability of 0.6585 or  $> 0.05$  then  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model. Based on the Chow Test on the regression equation of working capital management (WCM) and intellectual capital (IC) on Return

on Assets (ROA) in conditions during COVID-19 shows the probability in numbers 0.8410  $\text{know} > 0.05$  then  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model.

Table 13  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROE

Before COVID-19 (2017-2019)		During COVID-19 (2020-2022)	
<i>Test Summary</i>	<i>Prob</i>	<i>Test Summary</i>	<i>Prob</i>
F(2.54) = 0.16	0.8518	F(2.54) = 0.43	0.6524

Source: Stata 17 software processing results

Based on the Chow Test on the regression equation of working capital management (WCM) and intellectual capital (IC) on Return on Equity (ROE) in conditions before COVID-19 shows the probability in numbers 0.8518  $\text{know} > 0.05$  then  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model. Based on the Chow Test on the regression equation of working capital management (WCM) and intellectual capital (IC) on Return on Equity (ROE) in conditions during COVID-19 it shows the probability in numbers 0.6524  $\text{know} > 0.05$  then  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model.

Table 14  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on Firm Value

Before COVID-19 (2017-2019)		During COVID-19 (2020-2022)	
<i>Test Summary</i>	<i>Prob</i>	<i>Test Summary</i>	<i>Prob</i>
F(2.54) = 0.50	0.6113	F(2.54) = 0.50	0.6119

Source: Stata 17 software processing results

Based on the Chow test on the regression equation of working capital management (WCM) and intellectual capital (IC) on firm value in conditions before COVID-19, it shows a probability of 0.6113 or  $> 0.05$ , so  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model. Based on the Chow test on the regression equation of working capital management (WCM) and intellectual capital (IC) on firm value during COVID-19 conditions, it shows a probability of 0.6119 or  $> 0.05$ , so  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model

#### *Hausman test*

Table 15  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROA

Before COVID-19 (2017-2019)		During COVID-19 (2020-2022)	
<i>Chi-Sq. Statistics</i>	<i>Prob.</i>	<i>Test Summary</i>	<i>Prob</i>
0.47	0.9981	0.26	0.9997

Source: Stata 17 software processing results

Based on the Hausman Test on the regression equation of working capital management (WCM) and intellectual capital (IC) on Return on Assets (ROA) in conditions before COVID-19 shows a probability of 0.9981 or  $> 0.05$ , then  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model. Based on the Hausman Test on the regression equation of working capital management (WCM) and intellectual capital (IC) on Return on Assets (ROA) in conditions during COVID-19 it shows the probability in numbers 0.9997  $\text{know} > 0.05$  then  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model.

Table 16  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROE

Before COVID-19 (2017-2019)		During COVID-19 (2020-2022)	
<i>Chi-Sq. Statistics</i>	<i>Prob.</i>	<i>Test Summary</i>	<i>Prob</i>
0.10	1.0000	0.37	0.9991

Source: Stata 17 software processing results

Based on the Hausman Test on the regression equation of working capital management (WCM) and intellectual capital (IC) on Return on Equity (ROE) in conditions before COVID-19 shows a probability of 1.0000 or  $> 0.05$  then  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model. Based on the Hausman Test on the regression equation of working capital management (WCM) and intellectual capital (IC) on Return on Equity (ROE) during COVID-19 conditions, it shows a probability of 0.9991 or  $> 0.05$ , so  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model.

Table 17  
Effect of DIO, DSO, DPO, HCE, SCE, CEE on Firm Value

Before COVID-19 (2017-2019)		During COVID-19 (2020-2022)	
<i>Chi-Sq. Statistics</i>	<i>Prob.</i>	<i>Test Summary</i>	<i>Prob</i>
0.37	0.9991	0.82	0.9915

Source: Stata 17 software processing results

Based on the Hausman Test on the regression equation of working capital management (WCM) and intellectual capital (IC) on firm value in conditions before COVID-19 shows the probability in numbers 0.2982 or  $> 0.05$  then  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model. Based on the Hausman Test on the regression equation of working capital management (WCM) and intellectual capital (IC) on firm value during COVID-19 conditions, it shows the probability in numbers 0.9915 or  $> 0.05$  then  $H_0$  accepted and  $H_1$  rejected. This indicates that from testing the selected model is a random effect model.

*Statistic test*  
*Analysis of the Coefficient of Determination ( $R^2$ ) and Test F-Statistics*

Table 18  
The coefficient of determination ( $R^2$ ) and Test F-Statistics

	<i>Variables</i>	<i>ROA</i>		<i>ROE</i>		<i>TQ</i>	
		<i>Prob F</i>	<i>R<sup>2</sup></i>	<i>Prob F</i>	<i>R<sup>2</sup></i>	<i>Prob F</i>	<i>R<sup>2</sup></i>
Before COVID-19 (2017-2019)	DIO	0.0000	0.5841	0.0000	0.7497	0.0147	0.2205
	DSO	0.0000	0.5841	0.0000	0.7497	0.0147	0.2205
	DPO	0.0000	0.5841	0.0000	0.7497	0.0147	0.2205
	HCE	0.0000	0.5841	0.0000	0.7497	0.0147	0.2205
	Scce	0.0000	0.5841	0.0000	0.7497	0.0147	0.2205
	CEE	0.0000	0.5841	0.0000	0.7497	0.0147	0.2205
During COVID-19 (2020-2022)	DIO	0.0000	0.6717	0.0000	0.5416	0.0260	0.2039
	DSO	0.0000	0.6717	0.0000	0.5416	0.0260	0.2039
	DPO	0.0000	0.6717	0.0000	0.5416	0.0260	0.2039
	HCE	0.0000	0.6717	0.0000	0.5416	0.0260	0.2039
	Scce	0.0000	0.6717	0.0000	0.5416	0.0260	0.2039
	CEE	0.0000	0.6717	0.0000	0.5416	0.0260	0.2039

Source: Stata 17 software processing results

Based on Table 18 which shows the results of the F-Statistics test it can be concluded that:

- a) Effect DIO, DSO, DPO, HCE, SCE, CEE on Return on Assets (ROA)  
 In conditions before COVID-19, the results obtained by the probability value of the F-statistic were 0.0000 or <0.005 which indicated a significant  $\alpha$  5%. This concludes that overall the working capital management (WCM) and intellectual capital (IC) variables have an effect on Return on Assets (ROA) with an effect size of 58.41% and the remaining 41.59% is explained by other variables outside the study. In conditions during COVID-19, the results obtained for the probability value of the F-statistic were 0.0000 or <0.005 which showed a significant  $\alpha$  5%. This concludes that overall the working capital management (WCM) and intellectual capital (IC) variables have an effect on Return on Assets (ROA) with an effect size of 67.17% and the remaining 32.83% is explained by other variables outside the study.
- b) Effect DIO, DSO, DPO, HCE, SCE, CEE on Return on Equity (ROE)  
 In the conditions before COVID-19, the results obtained for the probability value of the F-statistic were 0.0000 or <0.005 which showed a significant  $\alpha$  5%. This concludes that overall the working capital management (WCM) and intellectual capital (IC) variables affect Return on Equity (ROE) with an effect size of 74.97% and the remaining 25.03% is explained by other variables outside the study. In conditions during COVID-19, the results obtained for the probability value of the F-statistic were 0.0000 or <0.005 which showed a significant  $\alpha$  5%. This concludes that overall the working capital management (WCM) and intellectual capital (IC) variables affect Return on Equity (ROE) with an effect size of 54.16% and the remaining 45.84% is explained by other variables outside the study.
- c) Effect DIO, DSO, DPO, HCE, SCE, CEE on Firm Value  
 In the conditions before COVID-19, the results obtained the probability value of the F-statistic was 0.0147 or <0.005 which showed a significant  $\alpha$  5%. This concludes that overall working capital management (WCM) and intellectual capital (IC) variables have an effect on firm value with an effect size of 22.05% and the remaining 77.95% is explained by other variables outside the study. In conditions during COVID-19, the results obtained for the probability value of the F-statistic were 0.0260 or <0.005 which showed a significant  $\alpha$  5%. This concludes that overall working capital management (WCM) and intellectual capital (IC) variables have an effect on firm value with an effect size of 20.39% and the remaining 79.61% is explained by other variables outside the study.

*Significance of Partial Effect (t test)*

Table 19  
 T-Statistics Test, Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROA

	<i>Variables</i>	<i>coefficient</i>	<i>std. err</i>	<i>t-Statistics</i>	<i>Probability</i>
Before COVID-19 (2017-2019)	DIO	-.0252756	.0161943	-1.56	0.119
	DSO	-.0218283	.0297906	-0.73	0.464
	DPO	.1086178	.0375748	2.89	0.004
	HCE	.8640514	.5969263	6.47	0.000
	SCE	.5587742	1.710296	4.42	0.000
	CEE	-.1651245	1.655171	-0.10	0.921
	Constant	-6.708025	3.254526	-2.06	0.039
During COVID-19 (2020-2022)	DIO	.0088457	.0145276	0.61	0.543
	DSO	-.0431425	.0321125	-1.34	0.179
	DPO	.0361691	.0342307	1.06	0.291
	HCE	.6248084	.273639	5.94	0.000
	SCE	.9932082	.2779453	-7,17	0.000
	CEE	1.110931	2.244241	-0.50	0.621
	Constant	4.984912	2.577888	1.93	0.053

Source: Stata 17 software processing results

Based on Table 19 shows the regression equation of working capital management (WCM) and intellectual capital (IC) on Return on Assets (ROA) with conditions before COVID-19. The regression equation obtained from the regression is as follows:

$$ROA = \alpha_0 + \beta_1 DIO + \beta_2 DSO + \beta_3 DPO + \beta_4 HCE + \beta_5 SCE + \beta_6 CEE + \varepsilon$$

Multiple linear regression equation before COVID-19:

$$ROA = (-6.708025) + (-0.0252756)*DIO + (-0.0218283)*DSO + 0.1086178*DPO + 0,8640514*HCE + 0.5587742*SCE + (-0.1651245)*CEE + \varepsilon$$

Multiple linear regression equation before COVID-19:

$$ROA = 4.984912+0.0088457*DIO + (-0.0431425)*DSO+0.0361691*DPO + 0.6248084*HCE+0.9932082*SCE+1.110931*CEE + \varepsilon$$

Based on the regression equation, it can be seen that:

- Based on the results of this regression, H1 is rejected. Whereas during COVID-19 conditions, the days of inventory outstanding (DIO) variable showed a probability of 0.543 or  $> 0.05$  which concluded that DIO had no significant effect on ROA. Based on the results of this regression, H1 is rejected.
- Based on the results of this regression, H2 is rejected. Whereas during COVID-19 conditions, the days of sales outstanding (DSO) variable showed a probability of 0.179 or  $> 0.05$  which concluded that DSO had no significant effect on ROA. Based on the results of this regression, H2 is rejected.
- Based on the results of this regression, H3 is accepted. Whereas during COVID-19 conditions, the days of payable outstanding (DPO) variable showed a probability of 0.291 or  $> 0.05$  which concluded that DPO had no significant effect on ROA. Based on the results of this regression, H3 is rejected.
- Based on the results of this regression, H10 is accepted. Whereas during COVID-19 conditions, the human capital efficiency (HCE) variable showed a probability of 0.000 or  $< 0.05$  which concluded that HCE had a positive and significant effect on ROA. Based on the results of this regression, H10 is accepted.
- Based on the results of this regression, H11 is accepted. Whereas during COVID-19 conditions, the structural capital efficiency (SCE) variable showed a probability of 0.000 or  $< 0.05$  which concluded that SCE had a positive and significant effect on ROA. Based on the results of this regression, H11 is accepted.
- Based on the results of this regression, H12 is rejected. Whereas during COVID-19 conditions, the capital employed efficiency (CEE) variable showed a probability of 0.621 or  $> 0.05$  which concluded that CEE had no significant effect on ROA. Based on the results of this regression, H12 is rejected

Table 20  
T-Statistics Test, Effect of DIO, DSO, DPO, HCE, SCE, CEE on ROE

	<i>Variables</i>	<i>coefficient</i>	<i>std. err</i>	<i>t-Statistics</i>	<i>Probability</i>
Before COVID-19 (2017-2019)	DIO	-.0111566	.0270612	-0.41	0.680
	DSO	.0373728	.0497812	0.75	0.453
	DPO	.075477	.0627889	1.20	0.229
	HCE	.956502	.0974865	9.59	0.000
	SCE	.745580	2.85797	2,61	0.009
	CEE	.173121	2.765854	6.26	0.000
	Constant	.9962072	5.438436	3.67	0.000
During COVID-19 (2020-2022)	DIO	-.0463636	.0527943	-0.88	0.380
	DSO	.0493494	.1166992	0,42	0.672
	DPO	.2373783	.1243966	1.91	0.056
	HCE	.450498	.9944236	4.53	0.000
	SCE	.416769	1.010073	4.13	0.000
	CEE	.1065434	8.155731	2.53	0.011
	Constant	.9071793	9.368227	0.10	0.923

Based on Table 20 shows the regression equation of working capital management (WCM) and intellectual capital (IC) on Return on Equity (ROE) with conditions before COVID-19. The regression equation obtained from the regression is as follows:

$$ROE = \alpha_0 + \beta_1 DIO + \beta_2 DSO + \beta_3 DPO + \beta_4 HCE + \beta_5 SCE + \beta_6 CEE + \varepsilon$$

Multiple linear regression equation before COVID-19:

$$ROE = 0.9962072 + (-0.0111566) * DIO + 0.0373728 * DSO + 0.075477 * DPO + 0.956502 * HCE + 0.745580 * SCE + 0.173121 * CEE + \varepsilon$$

Multiple linear regression equation during COVID-19:

$$ROE = 0.9071793 + (-0.0463636) * DIO + 0.0493494 * DSO + 0.2373783 * DPO + 0.450498 * HCE + 0.416769 * SCE + 0.1065434 * CEE + \varepsilon$$

Based on the regression equation, it can be seen that:

- In conditions before COVID-19, the days of inventory outstanding (DIO) variable showed a probability of 0.680 or  $> 0.05$  which concluded that DIO had no significant effect on ROE. Based on the results of this regression, H4 is rejected. Whereas during COVID-19 conditions, the days of inventory outstanding (DIO) variable showed a probability of 0.380 or  $> 0.05$  which concluded that DIO had no significant effect on ROE. Based on the results of this regression, H4 is rejected.
- In conditions before COVID-19, the days of sales outstanding (DSO) variable showed a probability of 0.453 or  $> 0.05$  which concluded that DSO had no significant effect on ROE. Based on the results of this regression, H5 is rejected. Whereas the days of sales outstanding (DSO) variable shows a probability of 0.672 or  $> 0.05$  which concludes that DSO has no significant effect on ROE. Based on the results of this regression, H5 is rejected.
- In conditions before COVID-19, the days of payable outstanding (DPO) variable showed a probability of 0.229 or  $> 0.05$  which concluded that DPO had no significant effect on ROE. Based on the results of this regression, H6 is rejected. Whereas during COVID-19 conditions, the days of payable outstanding (DPO) variable showed a probability of 0.056 or  $> 0.05$  which concluded that DPO had no significant effect on ROE. Based on the results of this regression, H6 is rejected.
- In conditions before COVID-19, the human capital efficiency (HCE) variable showed a probability of 0.000 or  $< 0.05$  which concluded that HCE had a positive and significant effect on ROE. Based on the results of this regression, H13 is accepted. Whereas during COVID-19 conditions, the human capital efficiency (HCE) variable showed a probability of 0.000 or  $< 0.05$  which concluded that HCE had a positive and significant effect on ROE. Based on the results of this regression, H13 is accepted.
- In conditions before COVID-19, the structural capital efficiency (SCE) variable showed a probability of 0.009 or  $< 0.05$  which concluded that SCE had a positive and significant effect on ROE. Based on the results of this regression, H14 is accepted. Whereas during COVID-19 conditions, the structural capital efficiency (SCE) variable showed a probability of 0.000 or  $< 0.05$  which concluded that SCE had a negative and significant effect on ROE. Based on the results of this regression, H14 is accepted.
- In conditions before COVID-19, the capital employed efficiency (CEE) variable showed a probability of 0.0000 or  $< 0.05$  which concluded that CEE had a positive and significant effect on ROE. Based on the results of this regression, H15 is accepted. Whereas during COVID-19 conditions, the capital employed efficiency (CEE) variable showed a probability of 0.011 or  $< 0.05$  which concluded that CEE had a positive and significant effect on ROE. Based on the results of this regression, H15 is accepted.

Table 21  
Statistical t-test, Effect of DIO, DSO, DPO, HCE, SCE, CEE on Firm Value

	<i>Variables</i>	<i>coefficient</i>	<i>std. err</i>	<i>t-Statistics</i>	<i>Probability</i>
Before COVID-19 (2017-2019)	DIO	-.0065366	.0118049	-0.55	0.580
	DSO	.0437324	.0217159	2.01	0.044
	DPO	-.0307233	.0273902	-1.12	0.262
	HCE	.4218231	.4351311	0.97	0.332
	SCE	0.380731	1.246725	3.05	0.002
	CEE	.0973964	1.206542	0.08	0.936
	Constant	3.746168	2.372396	1.58	0.114
During COVID-19 (2020- 2022)	DIO	-.0016062	.003322	-0.48	0.629
	DSO	.0233225	.0073431	3.18	0.001
	DPO	.0123851	.0078275	1.58	0.114
	HCE	.0152485	.0625726	0.24	0.807
	SCE	.0749918	.0635573	1.18	0.238



CEE	.8827334	.5131872	1.72	0.085
Constant	.1531307	.5894817	0.26	0.795

Based on Table 21 shows the regression equation of working capital management (WCM) and intellectual capital (IC) on firm value with conditions before COVID-19. The regression equation obtained from the regression is as follows:

$$\text{Firm Value} = \alpha_0 + \beta_1 \text{DIO} + \beta_2 \text{DSO} + \beta_3 \text{DPO} + \beta_4 \text{HCE} + \beta_5 \text{SCE} + \beta_6 \text{CEE} + \varepsilon$$

Multiple linear regression equation before COVID-19:

$$\text{Firm Value} = 3.746168 + (-0.0065366) * \text{DIO} + 0.0437324 * \text{DSO} + (-.0307233) * \text{DPO} + 0.4218231 * \text{HCE} + 0.380731 * \text{SCE} + 0.0973964 * \text{CEE} + \varepsilon$$

Multiple linear regression equation during COVID-19:

$$\text{Firm Value} = 0.1531307 + (-0.0016062) * \text{DIO} + 0.0233225 * \text{DSO} + 0.0123851 * \text{DPO} + 0.0152485 * \text{HCE} + 0.0749918 * \text{SCE} + 0.8827334 * \text{CEE} + \varepsilon$$

Based on the regression equation, it can be seen that:

- In the conditions during COVID-19, the days of inventory outstanding (DIO) variable showed a probability of 0.629 or  $> 0.05$  which concluded that DIO had no significant effect on firm value. Based on the results of this regression, H7 is rejected.
- In conditions during COVID-19, the days of sales outstanding (DSO) variable showed a probability of 0.001 or  $< 0.05$  which concluded that DSO had a positive and significant effect on firm value. Based on the results of this regression, H8 is accepted.
- In the conditions during COVID-19, the days of payable outstanding (DPO) variable showed a probability of 0.114 or  $> 0.05$  which concluded that the DPO had no significant effect on firm value. Based on the results of this regression, H9 is rejected.
- In conditions during COVID-19, the human capital efficiency (HCE) variable showed a probability of 0.807 or  $> 0.05$  which concluded that HCE had no significant effect on firm value. Based on the results of this regression, H16 is rejected.
- During the COVID-19 conditions, the structural capital efficiency (SCE) variable showed a probability of 0.238 or  $> 0.05$  which concluded that SCE had no significant effect on firm value. Based on the results of this regression, H17 is rejected.

Under conditions during COVID-19, the capital employed efficiency (CEE) variable showed a probability of 0.085 or  $> 0.05$  which concluded that CEE had no significant effect on firm value. Based on the results of this regression, H18 is rejected.

## Discussion

### *Effect of DIO, DSO, DPO on Return on Assets (ROA)*

Viewed partially from the value of the DIO regression coefficient of -0.025 with a significant level of  $0.119 > 0.05$ , meaning that in conditions before COVID-19, the increase in DIO had no significant effect on return on assets (ROA). Whereas in the conditions during COVID-19, the value of the DIO regression coefficient was 0.008 with a significant level of  $0.543 > 0.05$ , meaning that an increase in DIO also has no significant effect on return on assets (ROA). This shows that food and beverage companies have implemented efficient inventory management practices. Companies with effective inventory control systems, precise demand forecasting, and implementing just-in-time inventory management can reduce storage costs. If the holding costs associated with inventory, such as storage, insurance, and damage, are low relative to a company's revenue or operating expenses, then the impact on ROA is insignificant. DIO that is not significant to ROA may indicate that inventory levels have been optimized so that they do not significantly affect profitability.

Then when viewed partially from the value of the DSO regression coefficient of -0.021 with a significant level of  $0.464 > 0.05$ , meaning that in conditions before COVID-19, DSO had no significant effect on return on assets (ROA). Whereas in conditions during COVID-19, the value of the DSO regression coefficient was -0.045 with a significant level of  $0.179 > 0.05$ , meaning that DSO also has no significant effect on return on assets (ROA). This

indicates that the food and beverage company has an efficient credit control process, proactive collection efforts, and effective accounts receivable management to minimize the negative impact of sales with long billing on profitability. COVID-19 has created significant economic uncertainty, with many industries including food and beverage companies experiencing supply chain disruptions, reduced consumer spending, and changes in buying behavior. This uncertainty can impact the relationship between DSO and ROA. During times of economic instability, company focus can shift from optimizing DSO to ensuring business continuity and maintaining customer relationships. Companies can be more lenient with credit terms or offer extended payment periods to maintain customer relationships. This policy resulted in a higher DSO. In this case, the insignificant effect of DSO on ROA may indicate that food and beverage companies tend to apply cost-control strategies to maintain profitability during a pandemic.

Next, when viewed partially, the value of the DPO regression coefficient is 0.108 with a significant level of 0.004 < 0.05, meaning that in conditions before COVID-19, an increase in DPO had a positive and significant effect on return on assets (ROA). These results identify that longer payment periods to suppliers have a positive impact on company profitability. A longer DPO can be an indication of efficient working capital management. This shows that the company uses accounts payable effectively by optimizing the timing of cash outflows. By extending payment periods without negatively affecting supplier relationships, companies can maintain optimal levels of inventory and accounts receivable while minimizing the need for external financing. Meanwhile, during COVID-19, the value of the DPO regression coefficient was 0.036 with a significant level of 0.291 > 0.05 meaning that under conditions during COVID-19, the increase in DPO did not affect return on assets (ROA). The occurrence of COVID-19 has disrupted the supply chain, including delays in delivery, reduced availability of goods, and cessation of production. These disruptions can affect a company's ability to comply with regular payment terms with suppliers. Companies also face difficulties in receiving goods or services on time, which results in delayed payments and higher DPOs. The insignificant effect of DPO on ROA reflects supply disruptions and delays caused by COVID-19.

#### *Effect of DIO, DSO, DPO on Return on Equity (ROE)*

Viewed partially in conditions before COVID-19, the value of the DIO regression coefficient is 0.011 with a significant level of 0.680 > 0.05, meaning that an increase in DIO has no significant effect on return on equity (ROE). Whereas in the conditions during COVID-19, the value of the DIO regression coefficient was 0.046 with a significant level of 0.380 > 0.05, meaning that an increase in DIO also has no significant effect on return on equity (ROE). Food and beverage products often have a limited shelf life and are subject to spoilage or expiration. As a result, inventory turnover and management are very important in this industry. However, the effect of DIO on ROE can be insignificant because companies in this sector generally have an efficient inventory management system to minimize wastage and damage. Companies engaged in food and beverage are more focused on maintaining inventory and optimizing production and distribution processes which can limit DIO's direct influence on return on equity.

Then when viewed partially in conditions before COVID-19, the value of the DSO regression coefficient is 0.037 with a significant level of 0.453 > 0.05, meaning that an increase in DSO has no significant effect on return on equity (ROE). Whereas in conditions during COVID-19, the value of the DSO regression coefficient was 0.049 with a significant level of 0.672 > 0.05, meaning that an increase in DSO also has no significant effect on return on equity (ROE). In the food and beverage industry, it is common for businesses to have shorter payment terms or fast payment terms. As a result, the impact of DSO on ROE is less significant because the average collection period is relatively shorter compared to other industries. Industry payment norms can result in reduced DSO variability resulting in less impact on ROE.

Next, when viewed partially in conditions before COVID-19, the value of the DPO regression coefficient is 0.075 with a significant level of 0.229 > 0.05, meaning that an increase in DPO does not affect the return on equity (ROE). Whereas in the conditions during COVID-19, the value of the DPO regression coefficient was 0.237 with a significant level of 0.056 < 0.05 means that an increase in DPO also does not affect the return on equity (ROE). Food and beverage companies tend to face intense competition and cost pressures. The company strives to maintain healthy profit margins by optimizing its cost structure, including raw material costs and operating costs. While DPO can affect the timing of cash outflows to suppliers the emphasis on cost control has a more significant influence on ROE. Companies can prioritize cost management strategies over payment terms with suppliers, resulting in a non-significant DPO effect on ROE.

### *Effect of DIO, DSO, DPO on Firm Value*

Viewed partially in conditions before COVID-19, the value of the DIO regression coefficient is -0.006 with a significant level of  $0.580 > 0.05$ , meaning that an increase in DIO has no significant effect on firm value. Whereas in the conditions during COVID-19, the value of the DIO regression coefficient was -0.001 with a significant level of  $0.629 > 0.05$ , meaning that an increase in DIO also has no significant effect on firm value. Food and beverage companies often compete based on product differentiation and branding. The value of a food or beverage brand comes from factors such as taste, quality, reputation, and customer loyalty. These intangible assets can have a more significant impact on company value than inventory management. Investors are focusing more on brand strength, market positioning, and consumer demand than the number of days of inventory outstanding.

Then when viewed partially in conditions before COVID-19, the value of the DSO regression coefficient is 0.043 with a significant level of  $0.044 < 0.05$ , meaning that an increase in DSO has a positive and significant effect on firm value. Whereas in conditions during COVID-19, the value of the DSO regression coefficient was 0.023 with a significant level of  $0.001 < 0.05$ , meaning that an increase in DSO also has a positive and significant effect on firm value. The food and beverage industry often operates under certain payment and credit terms that are widely accepted by customers and suppliers. These norms and practices can result in relatively consistent and predictable payment cycles. Investors and market participants may take these industry norms into account when assessing company value, leading to a reduced effect of DSO on firm value. As long as a company's DSO is aligned with industry standards, its effect on firm value may be less significant.

Next, when viewed partially in conditions before COVID-19, the DPO regression coefficient is -0.030 with a significant level of  $0.262 > 0.05$ , meaning that an increase in DPO does not affect firm value. Whereas in the conditions during COVID-19, the value of the DPO regression coefficient was 0.12 with a significant level of  $0.114 > 0.05$ , which means that an increase in DPO also does not affect firm value. Company value in the food and beverage industry is influenced by various factors outside the DPO, including revenue growth, profitability, market share, brand strength, product innovation, distribution network, and competitive advantage. Investors can prioritize evaluating these aspects when determining company value, with the DPO being one component among many.

### *Effect of HCE, SCE, CEE on Return on Assets (ROA)*

Viewed partially in conditions before COVID-19, the value of the HCE regression coefficient is 3,864 with a significant level of  $0.000 < 0.05$ , meaning that an increase in HCE has a positive and significant effect on return on assets (ROA). Meanwhile, during the COVID-19 period, the HCE regression coefficient was 1,624 with a significant level of  $0.000 < 0.05$ , meaning that an increase in HCE also has a significant positive effect on return on assets (ROA). Human resource efficiency measures the productivity and effectiveness of the workforce in generating revenue and utilizing company assets. A highly efficient workforce can contribute to improved operational performance and increased productivity, leading to higher revenues and better asset utilization. Engaged and committed employees tend to be more productive and motivated, resulting in better business performance. Food and beverage companies that prioritize employee engagement and retention can benefit from reduced turnover costs, better teamwork, and a more positive work environment. These factors contribute to higher human resource efficiency and have a positive impact on ROA. This indicates that human capital plays an important role in driving innovation and adapting to changing market trends in the food and beverage industry. Companies with an innovative and adaptable workforce are in a better position to introduce new products, improve processes, and respond effectively to customer demands.

Then when viewed partially in conditions before COVID-19, the value of the SCE regression coefficient is 7,558 with a significant level of  $0.000 < 0.05$ , meaning that SCE has a positive and significant effect on return on assets (ROA). Whereas during COVID-19 conditions, the value of the SCE regression coefficient was 1,993 with a significant level of  $0.000 < 0.05$ , meaning that an increase in SCE also has a positive and significant effect on return on assets (ROA). SCE refers to the intangible assets and infrastructure within a company, such as systems, processes, patents, trademarks, and databases. When these assets are used and managed efficiently, they can contribute to simplified operations, reduce costs, and improve overall efficiency. Effective SCE enables knowledge sharing, collaboration, and innovation within the organization. Well-designed systems, processes, and databases facilitate knowledge capture, organization, and dissemination, leading to improved decision-making and operational effectiveness. Structural capital efficiency enables food and beverage companies to develop and implement innovative processes, ensuring operational excellence and scalability. Simplified and well-documented processes allow companies to increase efficiency, reduce costs and manage growth effectively. This capacity for process

innovation and scalability positively influences ROA (Wiig, 1997; Baños-Caballero et al., 2014; Boisjoly et al., 2020).

Next, when viewed partially in conditions before COVID-19, the value of the CEE regression coefficient is 0.165 with a significant level of  $0.921 > 0.05$ , meaning that an increase in CEE has no significant effect on return on assets (ROA). Whereas in conditions during COVID-19, the value of the CEE regression coefficient was -1,110 with a significant level of  $0.621 > 0.05$  meaning that an increase in CEE also does not affect return on assets (ROA). The food and beverage industry is characterized by high capital intensity, as it requires significant investment in production facilities, equipment, and supplies. As a result, efficient use of capital is less prominent in determining ROA compared to other industries. Other factors such as market demand, price dynamics, and competition may have a more significant impact on ROA in this industry. Food and beverage companies are also likely to face cost pressures related to raw materials, labor, transportation, and marketing costs. This cost structure can limit the impact of efficient use of capital on ROA.

#### *Effect of HCE, SCE, CEE on Return on Equity (ROE)*

Viewed partially in conditions before COVID-19, the value of the HCE regression coefficient is 9,565 with a significant level of  $0.000 < 0.05$ , meaning that an increase in HCE has a positive and significant effect on return on equity (ROE). Meanwhile, during the COVID-19 period, the HCE regression coefficient was 4,504 with a significant level of  $0.000 < 0.05$ , meaning that an increase in HCE also has a significant positive effect on return on equity (ROE). Human resource efficiency is closely related to employee engagement and retention. Food and beverage companies that invest in creating a positive work environment, providing training and development opportunities, and promoting employee well-being tend to have a more engaged and committed workforce. Engaged employees are more productive, motivated, and loyal, which can have a positive impact on a company's financial performance and ROE. Human resources play an important role in driving product innovation and development in the food and beverage industry. Companies that prioritize research and development, encourage creativity, and foster a culture of innovation are better positioned to introduce new products, enhance existing offerings, and respond to changing consumer demands. Effective utilization of human capital in this area can lead to increased market share, revenue growth, and higher ROE.

Then when viewed partially in conditions before COVID-19, the value of the SCE regression coefficient is 7,455 with a significant level of  $0.009 < 0.05$ , meaning that SCE has a positive and significant effect on return on equity (ROE). Whereas during COVID-19 conditions, the value of the SCE regression coefficient was 4,167 with a significant level of  $0.000 < 0.05$ , meaning that an increase in SCE also has a positive and significant effect on return on equity (ROE). Structural capital efficiency in managing supply chains can contribute to cost savings, increased operational efficiency, and increased profitability. A food and beverage company that has optimal supply chain processes, effective vendor management, and efficient logistics can reduce costs, improve product quality, and ensure on-time delivery. This efficiency has a positive impact on profitability and ROE. In addition, effective knowledge management systems and organizational learning processes are essential for food and beverage companies. The efficiency of structural capital in capturing, sharing, and leveraging knowledge across the organization drives better decision making, process improvement, and operational effectiveness. Companies that excel in knowledge management can achieve higher productivity, quality, and innovation, resulting in increased ROE.

Next, when viewed partially in conditions before COVID-19, the value of the CEE regression coefficient is 17,312 with a significant level of  $0.000 < 0.05$ , meaning that an increase in CEE has a positive and significant effect on return on equity (ROE). Whereas during COVID-19 conditions, the CEE regression coefficient was 20.654 with a significant level of  $0.011 < 0.05$  meaning that an increase in CEE also had a positive and significant effect on return on equity (ROE). Efficient use of capital reflects a company's ability to allocate its financial resources effectively. Food and beverage companies that efficiently manage capital employed can make strategic investments, optimize their asset base, and minimize unnecessary capital tied up in unproductive or low-performing assets. Efficiency in the use of capital is closely related to operational performance. Companies that effectively manage the capital used can improve production processes, reduce costs, and improve overall operational efficiency. Efficient use of capital includes management of working capital, including management of receivables, payables, and inventories. A food and beverage company that optimizes its working capital cycle by minimizing receivables, maximizing payables, and efficiently managing inventory levels can improve cash flow and reduce financing costs. This better management of working capital leads to increased profitability and ROE. including management of receivables, payables, and inventories. A food and beverage company that optimizes its working capital cycle by minimizing receivables,

maximizing payables, and efficiently managing inventory levels can improve cash flow and reduce financing costs. This better management of working capital leads to increased profitability and ROE. including management of receivables, payables, and inventories. A food and beverage company that optimizes its working capital cycle by minimizing receivables, maximizing payables, and efficiently managing inventory levels can improve cash flow and reduce financing costs. This better management of working capital leads to increased profitability and ROE (Aktas et al., 2015; Sumedrea, 2013; Hashim et al., 2015; Sugosha & Artini, 2020).

#### *Effect of HCE, SCE, CEE on Firm Value*

Viewed partially in conditions before COVID-19, the value of the HCE regression coefficient is 0.421 with a significant level of  $0.332 > 0.05$ , meaning that an increase in HCE has no significant effect on firm value. Meanwhile, during the COVID-19 period, the HCE regression coefficient was 0.015 with a significant level of  $0.807 > 0.05$ , meaning that an increase in HCE also has no significant effect on firm value. The food and beverage industry focuses more on tangible assets, such as production facilities, equipment, and supply chain management, rather than relying solely on human capital. As a result, HCE has a less significant effect on firm value when compared to other factors. Food and beverage companies often have standardized processes and procedures, which can limit the differentiation potential of human resources.

Then when viewed partially in conditions before COVID-19, the value of the SCE regression coefficient is 3,807 with a significant level of  $0.002 < 0.05$ , meaning that SCE has a positive and significant effect on firm value. Structural capital includes intangible assets such as brand reputation, trademarks, patents, and proprietary technology. Food and beverage companies that effectively manage and leverage their structural capital can build strong brand equity, which contributes to increased customer loyalty, higher sales, and premium prices. A positive brand reputation enhances a company's market position and overall company value. Furthermore, structural capital includes knowledge, expertise, and capabilities that are embedded in an organization. Food and beverage companies that capture, distribute, and use this knowledge effectively can improve operational efficiency, decision-making, and customer service. Efficient utilization of structural capital in enhancing organizational knowledge contributes to improved performance, market position, and firm value. Whereas during COVID-19 conditions, the value of the SCE regression coefficient was 0.074 with a significant level of  $0.238 > 0.05$ , meaning that an increase in SCE has no significant effect on firm value. COVID-19 emphasizes a short-term perspective dominated by immediate financial survival and stability. Market participants, including investors, are turning their attention to short-term financial indicators, liquidity ratios, and operational adaptability rather than evaluating the efficiency of long-term structural capital. This emphasis on short-term resilience can minimize the impact of SCE on firm value during a pandemic.

Next, when viewed partially in conditions before COVID-19, the value of the CEE regression coefficient is 0.097 with a significant level of  $0.936 > 0.05$ , meaning that an increase in CEE has no significant effect on firm value. Price dynamics in the food and beverage industry are influenced by various factors, including market competition, consumer preferences, and cost structure. While efficient use of capital is important for cost optimization and increased productivity, this does not translate directly into price strength or increased market share, which are important drivers of company value in the food and beverage industry. Whereas during COVID-19, the CEE regression coefficient was 0.882 with a significant level of  $0.085 < 0.05$  meaning that an increase in CEE had a positive and significant effect on firm value. Efficient use of capital reflects a company's ability to manage its assets effectively and generate profits. During COVID-19, when businesses faced economic challenges and income uncertainty, companies with better capital efficiency were able to optimize their asset utilization, reduce costs and maintain profitability. Operational efficiency and cost management have a positive impact on financial performance and company value. Firms with strong capital efficiency are often more adaptable and agile in responding to market changes and disruptions. During the pandemic, food and beverage companies that effectively leverage the resources their capital uses can quickly adjust their operations, product offerings, and distribution channels to meet changing consumer demands and supply chain challenges. This adaptation and agility can improve a company's competitiveness and market position, thereby increasing the value of the company (Kalkan et al., 2014; Rostami et al., 2016; Nneka et al., 2016).

#### *Limitations*

Researchers only analyzed the effect on return on assets (ROA), return on equity (ROE), and firm value with the dependent variables in the form of working capital management (WCM) and intellectual capital (IC) over 6 years,

namely from 2017-2022, as well as researchers using financial information data of companies in the food and beverage sector, which are limited in number.

## Conclusion

Based on the analysis and research results, it can be concluded that: Working capital management (WCM) based on days of inventory outstanding (DIO) and days of sales outstanding (DSO), both before and during COVID-19, does not affect return on assets (ROA). However, days of payable outstanding (DPO) only show a positive and significant influence before the occurrence of COVID-19, whereas during COVID-19, it does not affect return on assets (ROA). Working capital management (WCM) based on days of inventory outstanding (DIO), days of sales outstanding (DSO), and days of payable outstanding (DPO), both before and during COVID-19, does not affect return on equity (ROE). Working capital management (WCM) based on days of inventory outstanding (DIO) and days of payable outstanding (DPO), both before and during COVID-19, does not affect firm value. However, days of sales outstanding (DSO) show a positive and significant influence both before and during COVID-19.

Intellectual Capital (IC) based on human capital efficiency (HCE) and structural capital efficiency (SCE), both before and during COVID-19, have a positive and significant impact on return on assets (ROA). However, capital employed efficiency (CEE) does not affect return on assets (ROA), both before and during COVID-19. Intellectual Capital (IC) based on human capital efficiency (HCE), structural capital efficiency (SCE), and capital employed efficiency (CEE), both before and during COVID-19, have a positive and significant impact on return on equity (ROE). Intellectual Capital (IC) based on human capital efficiency (HCE), both before and during COVID-19, does not affect firm value. However, structural capital efficiency (SCE) and capital employed efficiency (CEE) only show a positive and significant influence during the occurrence of COVID-19. For further research it is suggested to be able to include other factors such as revenue growth, financial leverage, and sustainability growth, and further research is advised to analyze other sectors with a larger number of samples with a longer observation period.

## Acknowledgments

This paper is part of the requirements for completing the Master of Management, Universitas Sriwijaya.

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