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Stock Valuation Before and After the COVID-19 Pandemic: Free Cash Flow to Firm (FCFF) and Relative Valuation Approach with Discounted Cash Flow (DCF) Valuation Method

Virta Dimas Catur Diputra[1], Brady Rikumahu[2]
Telkom University, Jawa Barat, Indonesia[1,2]
virtacatur@gmail.com[1]

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Coresponding author:
Virta Dimas Catur Diputra
Telkom University, Jawa Barat, Indonesia
E-mail: virtacatur@gmail.com

ABSTRACT
Purpose: This study compares the valuation of hospital companies in Indonesia's healthcare sector before and during the Covid-19 pandemic on the Indonesia Stock Exchange (IDX). The pandemic impacted stock prices and valuations, making this analysis relevant for future crises.
Methodology/approach: The study analyzes data from before Covid-19 and its peak in July 2021, focusing on three hospital companies: HEAL, MIKA, and SILO. Valuation methods used are Discounted Cash Flow (Free Cash Flow to Firm) and Relative Valuation (PBV and PER).
Results/findings: The intrinsic value of all three companies increased across scenarios, along with share prices. MIKA's valuation remained stable, while SILO and HEAL changed in the moderate scenario. PER values rose for all companies.
Conclusions: The pandemic enhanced hospital stock valuations, showing increased investor confidence in healthcare during crises.
Limitations:. The study is limited to three hospital firms and one timeframe (July 2021), excluding broader sectoral and long-term effects.
Contribution: This study provides insights into stock valuation during crises and can guide future investment and policy decisions.

Keywords: *Covid-19 Pandemic, Discounted Cash Flow, Valuation*

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1. Introduction

At the beginning of 2020, a new phenomenon occurred that had never previously affected stock price movements, namely, the announcement of the Covid-19 outbreak. Covid-19 has become a new international issue that affects various sectors, including the economy and business. The first case of

Covid-19 occurred in Wuhan, China at the end of 2019. This virus pandemic has spread quickly from one country to another throughout the world, including Indonesia. In Indonesia, Covid-19 has changed the business landscape, mobility, and economy of the country. Many specific sectors have been negatively impacted by Covid-19.

In Asian countries, the COVID-19 outbreak has had a significantly negative impact on stock market returns. The IHSG also experienced a decline of 37.5% for three weeks, from 6,300 at the beginning of 2020 to 3,938 on March 24, 2020 (Frensidi, 2022). The pandemic is a new phenomenon that is different from previous crises, which are mostly influenced by economic factors. For this reason, the impact of the sectors on the IDX is also different. The health sector, especially hospitals, saw an increase in income during the pandemic, which also affected investors' expectations regarding the fair price of shares of health issuers. Furthermore, this expectation also influences investors' returns from the potential capital gains that investors can obtain.

Based on the official Indonesian government information portal Indonesia.go.id, the Covid-19 case was first confirmed in Indonesia on March 2, 2020 (Nuraini, 2020). However, news about Covid internationally had started to spread internationally. The Covid-19 case was first detected in Wuhan, China, at the end of December 2019 (WHO, 2020).

The influence of Covid-19 began to be felt in Indonesia at the beginning of 2020. Based on historical data, IHSG experienced a decline in January 2020 until it reached its lowest point in March 2020 when Covid-19 was first announced in Indonesia. The JCI then moved up until it returned to its pre-Covid-19 state in January, 2021. Research on the performance of issuers on the IDX before Covid-19 occurred and during Covid-19 has been carried out by Permana, Nurpiana, Kosim, and Hidayat (2022). They studied the performance of Indonesian shares before and during the Covid-19 pandemic. They conducted different tests and concluded that there were differences in the performance of Indonesian shares before and during the Covid-19 pandemic. Departing from this research, researchers also see the need to conduct research regarding the influence of the crisis, especially due to the Covid-19 pandemic, on issuer valuations.

Other research was also conducted by Uzliawati, Yuliana, Januarsi, and Santoso (2018) which focuses on how company valuation is influenced not by phenomena but by capital structure. In previous research, he stated that the higher the long-term capital structure, the higher is the company value. In this research, what is looked at apart from the valuation of the ability to generate cash flow during Covid-19, is also to look at the valuation based on the ability to generate income (price to earnings ratio/PER) and the company's book value (Price to Book Value/PBV).

Research conducted by Cahyono and Hendrawan (2019) evaluated the intrinsic value of coal company shares listed on IDX in 2018. They used the Discounted Cash Flow (DCF) method with the Free Cash Flow to the Company (FCFF) approach, and Relative Valuation with the PER approach and PBV. The research objects were BYAN, ADRO, and PTBA. According to the results of this research, ADRO, BYAN, and PTBA were classified as overvalued in all scenarios studied. In this research, an intrinsic and relative valuation analysis will be carried out for hospital issuers on the IDX during Covid-19 and before Covid-19.

Wibowo and Timotius (2018) also compared the valuation of issuers on the Indonesia Stock Exchange (BEI) using the Price Earnings Ratio (PER), Price to Book Value (PBV), and Discounted Cash Flow (DCF) methods. The research results show that there are significant differences in issuer valuations among the three methods. This research provides a better understanding of the intrinsic value of a company's shares and guidance for investors in making investment decisions. However, the research does not focus on certain sectors, so more in-depth research needs to be done on certain sectors, such as health and when an event occurs that can influence investment decisions, such as the Covid-19 pandemic.

In certain sectors, research related to the valuation of issuers has also been conducted by Setiawan et al. (2020), which focuses on the banking sector in Indonesia. This study uses the Comparative Valuation method by comparing the price-to-earnings ratio (PER) and price-to-book value (PBV) of banking issuers listed on the Indonesia Stock Exchange. The results show that there are differences in valuation between these banking issuers, with some issuers having higher valuations than others. This study provides insight into stock valuations in the banking sector and can be used as a reference for investors interested in investing in this sector. In this research, in addition to using relative PER and PBV valuations, intrinsic valuation is also examined using discounted Free Cash Flow to Firm (FCFF) (DCF). From several previous studies, the author is interested in conducting research with the title: *Stock valuation before and after the COVID-19 pandemic: Free Cash Flow to Firm (FCFF), and the relative valuation approach with the ((DCF) valuation method.*

1.1 Formulation of the problem

Based on the identification and background of the problem analyzed by the researcher, several problem formulations were proposed.

1. What were the movements of free cash flow to firms, earnings, and share price from year to year before the Covid-19 pandemic and at the peak of the Covid-19 pandemic?
2. What was the share valuation of the hospital issuers studied before the Covid-19 pandemic and at the peak of the Covid-19 pandemic, calculated using intrinsic valuation using the Discounted Free Cash Flow to Firm method and relative valuation using PER and PBV?
3. Were hospital issuers undervalued, fairvalued, or overvalued before the Covid-19 pandemic and at the peak of the Covid-19 pandemic?
4. How large is the difference between the fair value and share price of hospital issuers before the Covid-19 pandemic and at the peak of the Covid-19 pandemic?

1.2. Research purposes

There are four objectives of this research, namely:

1. Examining the movement of free cash flow to firms, earnings, and share price movements from year to year before the Covid-19 pandemic and at the peak of the Covid-19 pandemic.
2. Calculate the share valuation of hospital issuers before the Covid-19 pandemic and at the peak of the Covid-19 pandemic using intrinsic valuation using the Discounted Free Cash Flow to Firm method and relative valuation using PER and PBV.
3. Determine the valuation conditions of the hospital issuers under study (undervalue, fair value, or overvalue) before the Covid-19 pandemic and at the peak of the Covid-19 pandemic.
4. The difference between the fair value and share price of hospital issuers before the Covid-19 pandemic and at the peak of the Covid-19 pandemic.

2. Literature review and hypothesis/es development

2.1 Valuation

Companies or Investors aim to maximize their profits by identifying mispriced securities, that is, securities that are priced lower than their fair value. One way to identify mispriced securities is to calculate their intrinsic value. Intrinsic value is a true, essential, and fundamental value that does not depend on chance, place, or person but is the same for everyone and everywhere (Garner, 2014).

This study used absolute and relative valuation models to determine the intrinsic or true value of these securities. Absolute and relative valuation models are commonly used by investors and financial analysts to identify underpriced stocks. Absolute valuation models calculate intrinsic value using a Discounted Cash Flow (DCF) approach, where the value of an asset is assessed based on expected cash flows adjusted for risk. This approach is in accordance with Buffet's view that intrinsic value can be obtained after taking expected cash flows in the future and calculating them back into the current value (Cunningham & Buffett, 2013).

The relative valuation model calculates the value of securities by comparing the value of a company's shares with other companies in the same industry. This approach refers to Brown's view, which states that relative valuation implicitly assumes that it is possible to determine a company’s value by

comparing it with similar companies, based on several ratios that compare share prices with relevant variables that influence share value (Relly & Brown, 2011).

This study uses several valuation models that include Discounted Cash Flow (DCF) by calculating Free Cash Flow to Firm (FCFF) and relative valuation using the price to earnings ratio (PER) and Price to Book Value (PBV) ratios. Using the PER ratio, the author refers to the results of Persson and Stahlberg (2014), who found that shares were not priced correctly using the PBV and PER ratios.

2.2 Research Framework

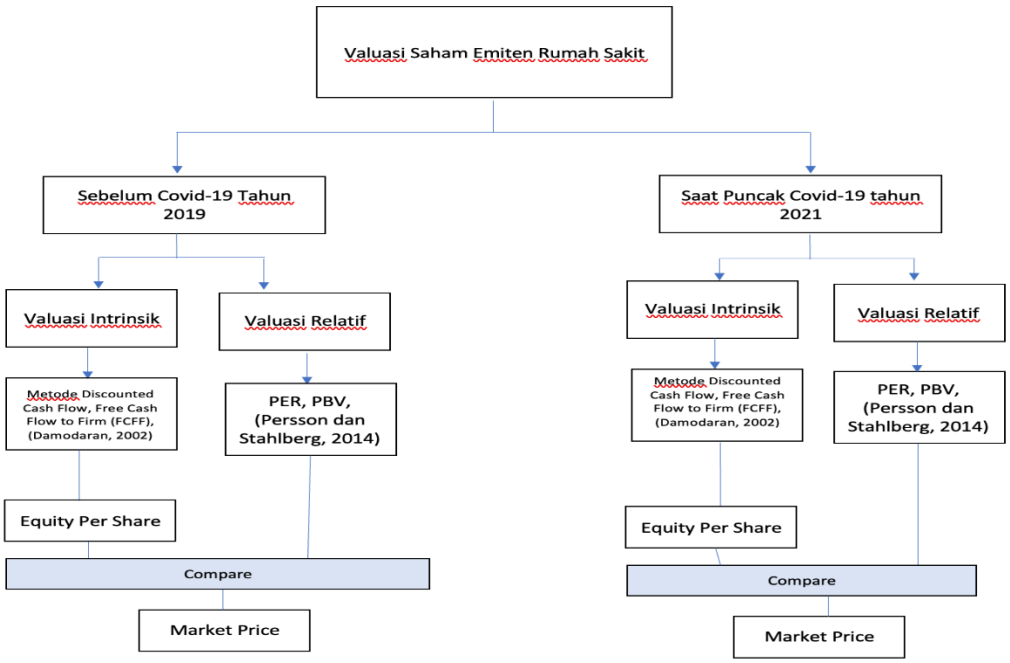

Figure 1. Research Framework

2.3 Research Hypothesis

Based on previous research, it is known that the Covid-19 pandemic has brought about differences in valuations for companies and depends on the impact of Covid-19 on the industry. Because the Covid-19 pandemic has had a positive impact on the performance of the health industry, especially hospitals, the hypothesis of this research is as follows:

2.3.1 Hypothesis before COVID-19

Before the COVID-19 pandemic, hospital stock valuations tended to be fair or perhaps slightly overvalued. This is based on the long-term increase in the demand for healthcare services in many developed countries, driven by population aging and developments in medical technology. In addition, healthcare markets in many developing countries also show strong growth potential. McKinsey and Company, "Healthcare's Next Frontier: Creating a Consumer-Centric Ecosystem" (2019).

2.3.2 Hypothesis after COVID-19 peak

After the pandemic, hospital stock valuations may return to fair value levels or may even be slightly undervalued. Stronger health policies and improved access to health services could support long-term demand, but concerns about rising healthcare costs and long-term economic uncertainty could also impact valuation. Reference: World Health Organization, "The Future of Health: New Report" (2021). In this context, the hypothesis states that there are differences in the valuations of companies in the health industry, including hospitals, before and during the Covid-19 pandemic.

3. Methodology

3.1 Types of Research

This research will be descriptively comparative in nature and will be carried out to describe the influence of the Covid-19 pandemic on the intrinsic valuation and relative valuation of health industry issuers, especially hospital issuers. Furthermore, we will compare the valuation results of the three research object issuers before the Covid-19 pandemic (December 2019) and at the peak of the pandemic (July 2022).

3.2 Variable Operationalization

The variable for this research is the valuation of three hospital issuers on the IDX in the two periods before and at the peak of the pandemic. The valuation that is calculated uses the Discounted Cash Flow (DCF) and relative (PER and PBV) methods. To calculate valuation using DCF, researchers will use the discounted Free-Cash Flow to Firm (FCFF) method to calculate WACC, which includes the Cost of Equity (CoE) and Cost of Debt (CoD). The following is a table of operational variables used in this study.

Table 1. Variable Operational T

Variable	indicator	Description	Formula	scale
intrinsic value with DCF, FCFF, RV, PER, and PBV	FCFF	cash flow available to all capital providers after the company has calculated its investment needs and after paying operating expenses including	FCFF = EBIT (1-Tax rate)+Depresiasi-Capital Expenditure-Delta Working capital	ratio
	Terminal Value	the present value of all future cash flows that arise after the time period covered	TV = Cash Flow 1-n/r*stable growth	ratio
	WACC	discount rate that reflects the cost of the composition of financing from all sources of	WACC = (E/V*Ke)+(D/V)*Kd*(1-Tax rate)	ratio
	EV (Enterprise Value)	the present value of future free cash flow at a weighted average discount rate	Value of a firm = CF/(1+Kn)^t + Terminal Value/ (1+Kn)^n	ratio
	Equity Value	subtracting EV from the amount of debt then adding it to the amount of cash owned	Equity value = EV- Total Debt + Cash	ratio
	relative valuation/intrinsic	compare PER and PBV, DCF, with industry PER and PBV	PER Min <PER DCF<PER Max ==> Valid	ratio
			PBV Min <PER DCF<PBV Max ==> Valid	
	PER	the ratio between market price per share to earnings per share	PER = Value Of equity / Earning After Tax	ratio
	PBV	the ratio between the market price per share to the book value of equity per share	PVB = Value Of Equity / Book Value of Equity	ratio

Source: Data that has been process

3.3 Population and Sample

This research will collect quantitative data because they are generally collected in a structured and formless manner. The data collected in this research are secondary data because they were collected from existing sources (Sekaran 2010:37). Data was collected from both the annual report for Q4 2019 and the Quarterly report for Q2 2021 for each company. These annual financial reports and quarterly financial reports can be downloaded from www.idx.co.id as well as the websites of each company.

Because share price movements are also influenced by busy share transactions. For this reason, shares with low public ownership tend not to be very active in the market. The daily buying and selling frequency of SRAJ shares is also very low, on average below 100 times. So SRAJ shares are easier to influence transactions of large capital owners. So SRAJ shares were not included in the research sample.

Table 2. List of Hospital Companies with Public Share Ownership Composition

Issuer	**Public Share Ownership (%)**
PT Medikaloka Hermina Tbk (HEAL)	38.31
PT Mitra Keluarga Karyasehat Tbk (MIKA)	35.48
PT Siloam International Hospitals (SILO)	23.96

PT Sejahteraraya Anugrahjaya Tbk (SRAJ)	5.94

Source: Data processed from RTI Business, 2023

Based on the information above, this research will limit the research to comparative stock valuations of hospital issuers with the following limitations:

1. The period before Covid-19 in question is the years before January 2020, before Covid-19 was announced to have occurred in Indonesia (02 March 2020).
2. The period during Covid-19 in question is the peak of the Delta Wave, namely July 2021.
3. There were 3 issuers compared, namely HEAL, MIKA, and SILO.
4. The valuation method used is Discounted Cash Flow using the Free Cash Flow to Firm (FCFF) model and Relative Valuation Analysis (PER and PBV).

3.4 Data Collection

Researchers will collect some secondary data consisting of:

1. Published and audited financial reports for the last five years of the sample company, namely in the period 2018 to 2022. Financial report data for the five years was taken from the annual report of the company studied.
2. Stock beta before Covid-19 in Indonesia, namely January 2020 and at the peak of Covid-19, namely July 2021, obtained from Yahoo Finance.
3. Data on Indonesian macroeconomic variables including Indonesian bank interest rates (BI) which can be obtained from www.bi.go.id. And increase gross domestic growth (GDP) obtained from www.bps.go.id from 2015-2020 (the last 5 years before Covid-19) and 2016-2021 (the last 5 years before the peak of Covid-19 in July 2021).
4. Industrial PER and PBV data in January 2020 (before Covid-19 in Indonesia) and July 2021 (during the peak of Covid-19, July 2021) which can be obtained from www.idx.co.id.

3.5 Data Analysis Techniques

The method used in calculating the share valuation value of PT Mitra Keluarga Karya Sehat Tbk (MIKA), PT Siloam Hospital International Tbk (SILO), and PT Medikaloka Hermina Tbk (HEAL) is the discounted cash flow, free cash flow to firm (DCF- FCFF) and relative valuation (PER and PBV). The DCF-FCFF method was chosen in this research because it can estimate the intrinsic value of the shares of the 3 hospital issuers that are the object of research. With this method, it is hoped that we can analyze valuation from a company's fundamental perspective before Covid-19 and at the peak of Covid-19, July 2021. Meanwhile, the author uses the Relative Valuation (RV) method to analyze from the market side. This research will compare the Price to Earning Ratio (PER) and Price to book Value (PBV) of the 3 research objects with market conditions before the pandemic and the peak of the pandemic.

3.5.1 Analysis of DCF-FCFF Method Valuation Data

The stage of estimating the intrinsic value of shares using the DCF approach, the FCFF approach (Damodaran, 2012) begins with classifying historical data as a basis for projections, carrying out projections and analysis of financial report ratios, and projecting growth values. Growth value projections are carried out using three scenarios, namely optimistic, moderate and pessimistic.

Table 3. Scenarios in Growth Value Projections

Scenario	**Company Average > Industry Average**	**Company Average < Industry Average**
Pessimistic	Average Industrial growth	Average company growth
Moderate	Average Company growth	Average Industrial growth
Optimistic	Average Company growth + Spread	Industry Growth Average + Spread

Source: Data that has been processed

The DCF-FCFF method is used to estimate the intrinsic value of shares by calculating the present value of FCFF. This value is then used as basic data to calculate Firm Value and Equity Value. By knowing Equity Value and the number of shares outstanding, we can obtain the company's intrinsic value.
The technique for calculating the intrinsic value of shares using the DCF approach with the FCFF approach is as follows:

a. Classifying historical financial report data which includes sales (revenue), percentage of operating costs (Operating Expense), EBITDA, depreciation, and net working capital. This data covers the period 2015-2020 before the Covid-19 pandemic and 2016-2021 when the peak of the Covid-19 pandemic occurred in July 2021. From this data, the average percentage of income (income) is calculated, as well as the average percentage of cost behavior which is then used as a reference for making projections.
b. Projections and ratio analysis of future financial statements taken from historical financial data, in carrying out company assessments involve elements of projections, estimates and assumptions.
c. Calculating free cash flow to firm, after projecting financial components such as sales, costs, depreciation/amortization, then calculate FCFF using the formula.

FCFF = (EBIT*(1-Tax Rate) + Depreciation + Amortization - change in operating assets and liabilities - capital expenditure)*

d. Calculating capital costs / capital costs, then to carry out a valuation using DCF-FCFF, namely determining the discount, what is used is WACC. WACC is calculated based on the proportion of sources used and the company's financing structure of capital and debt.

WACC = (Composition of equity * rate of equity) + ((composition of debt*rate of debt) *(1-tax))

e. Calculate the terminal value by assuming a constant perpetual growth rate (g) for the time after the analysis time period.
f. Calculate the equity value with enterprise value minus the amount of debt owned, minus the minority share ownership and plus the amount of cash owned.
g. Divide the intrinsic value of shares by equity value divided by the number of shares outstanding. The intrinsic value of shares will differ depending on the three predetermined scenario conditions (pessimistic, moderate and optimistic). After getting the intrinsic value, then compare the shares with the market during the evaluation period. The results of the comparison will conclude whether the intrinsic value condition is overvalued, fairvalued, or undervalued.

From the data above, researchers can compare the presence of Covid-19 and before Covid-19, whether the shares of the 3 hospital issuers that are the object of research are undervalued, fair valued, or over-valued based on intrinsic valuation and relative valuation.

Table 4. Summary of Stock Valuation Criteria Methods Used

Method	**Condition**	**Share price conditions**
DCF-FCFF	Intrinsic Value < Stock Market Price	The share price is in an overvalued position
	Intrinsic Value = Stock Market Price	The share price is in a fair valued position
	Intrinsic Value > Stock Market Price	The share price is in an undervalued position
PER	PER Intrinsic Value > industry average PER	The share price is in an overvalued position

	PER Intrinsic Value = industry average PER	The share price is in a fair valued position
	Intrinsic Value PER < industry average PER	The share price is in an undervalued position
PBV	PBV Intrinsic Value > industry average PBV	The share price is in an overvalued position
	PBV Intrinsic Value = industry average PBV	The share price is in a fair valued position
	PBV Intrinsic Value < industry average PBV	The share price is in an undervalued position

Source: processed data

The final step is to validate the valuation results obtained. Validation is carried out on the intrinsic values of PER and PBV resulting from the valuation. If the intrinsic values of PER and PBV are within the industry range then the valuation results are declared valid, and conversely if they are outside the industry range then the valuation results are declared invalid.

4. Results and discussion

4.1 Historical Performance of Research Object Companies

4.1.1 Absolute Valuation Analysis Using the DCF-FCFF Method

DCF evaluation is carried out by carrying out FCFF projections after establishing basic assumptions based on historical financial data. The calculation process involves determining growth scenarios to calculate FCFF projections from 2020 to 2024 (the period before Covid-19) and 2022-2026 (after the peak of Covid-19), with the aim of obtaining intrinsic value.

PT Siloam International Hospitals Tbk (SILO)

For an example of FCFF calculation, an example of FCFF calculation for SILO issuers in optimistic conditions before Covid-19 will be provided. The formula used is as follows:
FCFF = EBIAT + Depreciation - Change in Working Capital - Capital Expenditure
FCFF in 2021 for example = 890 + 759 - 182.6 - 900.5 = 370.67 Billion

The same calculation is used for forecasts for the next 5 years for the three issuers with optimistic, pessimistic and moderate scenarios. The FCFF calculation for the SILO example in the 5 year forecast before Covid-19 is as follows:

Table 5. FCFF SILO Calculation Before Covid-19 (In Billions of Rupiah)

Optimistic	1	2	3	4	5
Forecast	2020	2021	2022	2023	2024
Assumed Increase in Income	24,70%	24,70%	24,70%	24,70%	24,70%
Revenue	8.752,4	10.915,7	13.613,5	16.978,2	21.174,5
Cost of goods sold	-6.008,8	-7.493,9	-9.346,1	-11.656,1	-14.536,9
Operating expenses	-2.038,8	-2.542,7	-3.171,1	-3.954,9	-4.932,3
Other expenses	-112,3	-140,0	-174,6	-217,8	-271,6
Operating profit / EBITDA	592,6	739,0	921,7	1.149,5	1.433,6
Depreciation	609,0	759,6	947,3	1.181,4	1.473,4
Financial Burden	-121,0	-150,9	-188,2	-234,7	-292,8

EBIT	713,6	890,0	1.109,9	1.384,2	1.726,3
Tax	157,0	195,8	244,2	304,5	379,8
EBIAT	556,6	694,2	865,7	1.079,7	1.346,6
CAPEX	722,0	900,5	1.123,0	1.400,6	1.746,7
Working Capital	738,9	921,5	1.149,2	1.433,2	1.787,5
Change in Working Capital	310,1	182,6	227,7	284,0	354,2
FCFF	**133,48**	**370,67**	**462,28**	**576,54**	**719,03**

After finding the FCFF for each year, the present value is calculated by adjusting it to the WACC.
Present Value = Future Value /$(1+r)^n$ formula
The calculation can be seen in the table below (In billions of Rupiah):

FCFF	**133,48**	**370,67**	**462,28**	**576,54**	**719,03**
WACC	9,80%	9,80%	9,80%	9,80%	9,80%
	0,91	0,83	0,76	0,69	0,63
	121,59	307,54	349,37	396,89	450,87

Based on the results of valuation calculations using the DCF-FCFF method, SILO shares before Covid-19 and after Covid-19 have differences. Likewise with analysis when using optimistic, moderate and pessimistic growth scenarios.

Then, to calculate the valuation using Discounted Cashflow, you first calculate the Enterprise Value, Equity Value, and finally get the per share value. As an example of calculation, we will use an example of calculating the value of SILO shares for the period before Covid-19 and the following optimistic scenario:

1. Enterprise Value = Present Value FCFF + Terminal Value
   Enterprise Value = 1,626 + 11,442 = 13,068
2. Equity Value = Enterprise Value - Debt = 13,068 - 2,718 = 10,890
3. Equity Value + Cash = 10,890 + 1,066 = 11,956
4. Value per share = (Equity Value + Cash): Number of Shares Outstanding
5. Value per share = 11,956 / 13 = 919 rupiah per share

The same calculation will be used for 3 other issuers and in the period before and after the peak of Covid-19 with optimistic, pessimistic and moderate scenarios.

The results of SILO valuation calculations using the DCF method can be seen in the following table:

Table 6. DCF-FCFF SILO Valuation Calculation (In Billions of Rupiah)

SILO	**Before Covid-19**			**After the peak of Covid-19**		
	Optimistic	**Moderate**	**Pessimistic**	**Optimistic**	**Moderate**	**Pessimistic**
PV FCFF	1.626	1.526	1.260	4.005	3.349	2.660
Terminal Value	11.442	9.855	6.258	15.096	12.326	8.738
Enterprise Value	13.068	11.381	7.518	19.101	15.675	11.398
Debt	2.178	2.178	2.178	2.178	2.178	2.178
Equity Value	10.890	9.203	5.340	16.923	13.497	9.220
Cash	1.066	1.066	1.066	1.066	1.066	1.066
Equity Value + Cash	11.956	10.269	6.406	17.989	14.563	10.286

Number of shares outstanding	13	13	13	13	13	13
Value Per Share*	919	789	492	1.383	1.119	791

* True value

Then compare the intrinsic value (value per share) with the price at the close of December 31 2019 (pre-Covid-19 period) and December 31 2022 (post-Covid-19 peak).

In the optimistic scenario, the intrinsic value of SILO before Covid-19 was 919 compared to the price of SILO on December 31 2019, namely 875, so the valuation is undervalued. Meanwhile, for the moderate and pessimistic scenarios, the intrinsic value is below 875 so it is categorized as overvalued. In the valuation after the peak of Covid-19, there was an increase in the intrinsic value of SILO and the market price of SILO also rose, namely 1,220 on 31 December 2022. So in an optimistic scenario with an intrinsic value of 1,383, SILO shares were categorized as undervalued compared to the market price on 31 December 2022. Meanwhile in the moderate scenario, SILO is still overvalued with an intrinsic value of 1,119 and the pessimistic valuation is also categorized as overvalued with a value of 791 below the market price of 1,220.

Table 7. Comparison of SILO intrinsic value with current prices

Before Covid-19	SILO Intrinsic Value	**SILO Price 31 December 2019**	Valuation
Optimistic	919	875	***Undervalued***
Moderate	789		*Overvalued*
Pesimistic	492		*Overvalued*
After the peak of Covid-19	SILO Intrinsic Value	**SILO Price 31 December 2022**	Valuation
Optimistic	1.383	1220	***Undervalued***
Moderate	1.119		*Overvalued*
Pesimistic	791		*Overvalued*

PT Mitra Keluarga Karya Sehat Tbk (MIKA)

The valuation calculation process using the DCF-FCFF method has also been carried out on MIKA shares in both periods and three scenarios, namely optimistic, pessimistic and moderate. The calculation results can be seen in the following table:

Table 8. Calculation of MIKA DCF-FCFF Valuation (In Billions of Rupiah)

MIKA	**Before Covid-19**			**After the peak of Covid-19**		
	Optimistic	**Moderate**	**Pesimistic**	**Optimistic**	**Moderate**	**Pesimistic**
PV FCFF	3.958	3.779	2.992	4.797	3.626	2.953
Terminal Value	29.831	26.217	16.035	36.530	35.712	25.798
Enterprise Value	33.789	29.996	19.027	41.328	39.339	28.751
Debt	783	783	783	783	783	783
Equity Value	33.006	29.212	18.243	40.544	38.555	27.968
Cash	1.857	1.857	1.857	1.857	1.857	1.857
Equity Value + Cash	34.863	31.069	20.100	42.401	40.412	29.825
Number of shares outstanding	14	14	14	14	14	14
Value Per Share*	2.446	2.180	1.411	2.976	2.836	2.093

*True value

After comparing the intrinsic value (value per share) with the price at the close of December 31 2019 (pre-Covid-19 period) and December 31 2022 (post-Covid-19 peak), it is known that MIKA's valuation is as follows:

Table 9. Comparison of MIKA's intrinsic value with current prices

Before Covid-19	MIKA Intrinsic Value	**MIKA Price 31 December 2019**	Valuation
Optimistic	2.446	2.660	***Overvalued***
Moderate	2.180		*Overvalued*
Pesimistic	1.411		*Overvalued*
After the peak of Covid-19	MIKA Intrinsic Value	**MIKA Price 31 December 2022**	Valuation
Optimistic	2.976	3.190	*Overvalued*
Moderate	2.836		*Overvalued*
Pesimistic	2.093		*Overvalued*

In the optimistic scenario, MIKA's intrinsic value before Covid-19 was 2,446 compared to MIKA's price on December 31 2019, namely 2,660, so the valuation is overvalued. Apart from that, for the moderate and pessimistic scenarios the intrinsic value is also below 2,660 so it is categorized as overvalued. In the valuation after the peak of Covid-19, although there was an increase in MIKA's intrinsic value, in all three scenarios the intrinsic value was still smaller than the market price, namely 3,190, making it overvalued.

PT Medikaloka Hermina Tbk (HEAL)

For the third issuer which is the object of research, the valuation calculation process using the DCF-FCFF method has also been carried out. Calculations were also carried out using three scenarios, namely optimistic, pessimistic and moderate and in the period before Covid-19 and after the peak of Covid-19. The calculation results can be seen in the following table:

Table 10. HEAL DCF-FCFF Valuation Calculation

HEAL	**Before Covid-19**			**After the peak of Covid-19**		
	Optimistic	**Moderate**	**Pesimistic**	**Optimistic**	**Moderate**	**Pesimistic**
PV FCFF	2.866	2.574	2.084	4.107	2.933	2.278
Terminal Value	9.244	8.820	7.210	19.402	20.266	12.904
Enterprise Value	12.110	11.394	9.294	23.508	23.199	15.182
Debt	1.016	1.016	1.016	1.016	1.016	1.016
Equity Value	11.094	10.378	8.278	22.493	22.183	14.167
Cash	1.791	1.791	1.791	1.791	1.791	1.791
HEAL	**Before Covid-19**			**After the peak of Covid-19**		
	Optimistic	**Moderate**	**Pesimistic**	**Optimistic**	**Moderate**	**Pesimistic**
Equaty Value + Cash	12.885	12.169	10.069	24.283	23.973	15.957
Number of shares outstanding	15	15	15	15	15	15
Value Per Share*	861	813	673	1.622	1.601	1.066

*True value

As before, the next step after knowing the intrinsic value of shares in two periods and three scenarios, the intrinsic value is compared with market prices and the following results are obtained:

Table 11. Comparison of HEAL's intrinsic value with current prices

Before Covid-19	HEAL Intrinsic Value	**HEAL Price 31 December 2019**	Valuation
Optimistic	861	728	***Undervalued***
Moderate	813		***Undervalued***
Pesimistic	673		*Overvalued*
After the peak of Covid-19	HEAL Intrinsic Value	**HEAL Price 31 December 2022**	Valuation
Optimistic	1.622	1.550	***Undervalued***
Moderate	1.601		***Undervalued***
Pesimistic	1.066		*Overvalued*

From table 11 it can be seen that the market price of HEAL on December 31 2019 (before Covid-19) the market price of HEAL was 728. This year, in the optimistic and moderate scenarios, the value of HEAL is undervalued. Furthermore, in the period 31 December 2022 (after the peak of Covid-19) there are also optimistic and moderate scenarios where the HEAL value is undervalued. Meanwhile, in the moderate and pessimistic scenarios, HEAL's market price is higher than its intrinsic value, making it overvalued.

4.1.2 Relative Valuation Analysis with PBV and PER

Apart from the DCF-FCFF method, relative valuation calculations are also carried out to obtain PER (Price to Earnings Ratio) and PBV (Price to Book Value) values. To calculate PER, compare share prices in the period before Covid-19, namely 31 December 2019 and after the peak of Covid-19, namely 31 December 2022, with Earning per share (or profit per share) at both times. Meanwhile, to calculate the PBV, compare the share prices for the two periods with the book value per share for the two periods.

PT Siloam International Hospitals Tbk (SILO)

The calculation of PER and PBV for SILO can be seen in table 4.18 where PER before Covid-19 was 1.6 and after the peak of Covid-19 was 16.1. Meanwhile PBV before Covid-19 was at 1.9 and after the peak of Covid-19 at 2.25. Apart from that, SILO's PER and PBV are in the industry average range so they are valid.

The PBV formula used is PBV = Price Per Share/Book Value Per Share. As an example of calculation, the SILO case before Covid-19 will be used, namely:

PBV = Price Per Share/Book Value Per Share
SILO PBV Before Covid-19 = 875/460 = 1.9x

The PER formula used is PER = Price Per Share / Earning Per Share. As an example of calculation, the SILO case before Covid-19 will be used, namely:

PER = Price Per Share / Earnings Per Share
PER = 875/539 = 1.6x

The same calculation was used for 3 other issuers in 2 periods, namely before Covid-19 and after the peak of Covid-19.

Table 12. Calculation of PER and PBV SILO before and after the peak of Covid-19

SILO	**After COVID-19**	**Before Covid-19**	
Book Value*	**7.052**	***Book Value***	**5.988**

Book Value Per Share	542	**PBV Industry**	**Valuation**	**Analisis**	***Book Value Per Share***	460	**PBV Industry**	**Valuation**	**Analysis**
Price To Book Value	2,25	3,75	*Undervalued*	Valid	***Price To Book Value***	1,9	2,84	*Undervalued*	Valid
Earning*	**984**				***Earning***	**7.018**			
Earning Per Share	76	**PER Industry**	**Valuation**	**Analisis**	***Earning Pershare***	539	**PER Industry**	**Valuation**	**Analysis**
Price To earning	16,1	128	*Undervalued*	Valid	***Price To earning***	1,6	-33	*Undervalued*	Valid

*in billions of rupiah

PT Mitra Keluarga Karya Sehat Tbk (MIKA)

PER and PBV calculations were also carried out on MIKA and the results are as shown in table 13. For MIKA, PER before Covid-19 was 11.8 and after the peak of Covid-19 it was 35.8. Meanwhile PBV before Covid-19 was 7.91 and after the peak of Covid-19 it was 7.41. When compared with PBV and PER, the MIKA industry was in an overvalued condition before Covid-19 because the figure was far above the industry and after Covid-19, PBV is still overvalued but the PER is still smaller than the industry. However, MIKA's PER and PBV are in the industry average range so they are valid.

Table 13. Calculation of PER and PBV for MIKA before and after the peak of Covid-19

MIKA	**Before COVID-19**				**After Covid-19**				
Book Value*	**6.132**				***Book Value****	**4.793**			
Book Value Per Share	430	**PBV Industry**	**Valuation**	**Analysis**	***Book Value Per Share***	336	**PBV Industri**	**Valuation**	**Analysis**
Price To Book Value	7,41	3,75	*Overvalued*	Valid	***Price To Book Value***	7,91	2,84	*Overvalued*	Valid
Earning*	**1.271**				***Earning****	**3.205**			
Earning Per Share	89	**PER Industry**	**Valuation**	**Analysis**	***Earning Pershare***	225	**PER Industry**	**Valuation**	**Analysis**
Price To earning	35,8	128	*Undervalued*	Valid	***Price To earning***	11,8	-33	*Overvalued*	Valid

*in billions of rupiah

PT Medikaloka Hermina Tbk (HEAL)

For the third issuer, namely HEAL, the PER and PBV calculations can be seen in table 14. PER before Covid-19 HEAL was 13.8 and after the peak of Covid-19 it was 3. Meanwhile PBV before Covid-19 was at 3.12 slightly below the industry and after the peak of Covid-19 at 3.94 above the industry PBV and make it overvalued. However, HEAL's PER and PBV are in the industry average range so they are valid.

Table 14. Calculation of PER and PBV HEAL before and after the peak of Covid-19

HEAL	**Before COVID-19**	**After Covid-19**

Book Value*	**2.764**				***Book Value****	**7.436**			
Book Value Per Share	185	**PBV Industry**	**Valuation**	**Analysis**	***Book Value Per Share***	497	**PBV Industry**	**Valuation**	**Analysis**
Price To Book Value	3,94		*Overvalued*	Valid	***Price To Book Value***	3,12	2,84	*Overvalued*	Valid
Earning*	**3.631**				***Earning****	**1.682**			
Earning Pershare	243	**PER Industry**	**Valuation**	**Analysis**	***Earning Per Share***	112	**PER Industry**	**Valuation**	**Analysis**
Price To earning	13,8	128	*Undervalued*	Valid	***Price To earning***	3	-33	*Undervalued*	Valid

*in billions of rupiah

The PER calculation results for the three issuers are as follows:

Issuer	**2019**				**2022**			
	PER	**PER Industry**	**Valuation**	**Analysis**	**PER**	**PER Industry**	**Valuation**	**Analysis**
SILO	1,6	-33	*Undervalued*	Valid	16,1	128	*Undervalued*	Valid
MIKA	11,8		*Overvalued*	Valid	35,8		*Undervalued*	Valid
HEAL	3		*Undervalued*	Valid	13,8		*Undervalued*	Valid

The PBV calculation results for the three issuers are as follows:

Issuer	**2019**				**2022**			
	PBV	**PBV Industry**	**Valuation**	**Analysis**	**PBV**	**PBV Industry**	**Valuation**	**Analysis**
SILO	1,9	2,84	*Undervalued*	Valid	2,25	3,75	*Undervalued*	Valid
MIKA	7,91		*Overvalued*	Valid	7,41		*Overvalued*	Valid
HEAL	3,12		*Overvalued*	Valid	3,94		*Overvalued*	Valid

4.2 Research Discussion

This research was conducted using two methods, namely absolute valuation using DCF-FCFF and relative valuation using the PER and PBV methods to determine the intrinsic value of three companies operating in the hospital industry, namely SILO, MIKA, and HEAL. There are two periods calculated, namely the period before Covid-19 (historical data used before December 2019 and projections for the next 5 years) and after the peak of Covid-19 (historical data used before 31 December 2022 and projections for the next 5 years). This research also uses pessimistic, moderate and optimistic scenarios. As is known, during the period after the peak of Covid-19, throughout the last 2 (two) years Indonesia and countries around the world were hit by a pandemic and this resulted in hospital issuers experiencing an increase in income as can be seen in the historical data in this discussion chapter. Rising income amidst conditions of uncertainty will affect company value. So company valuation provides a comprehensive picture of the extent to which macro and micro level changes can influence business and become a concern for all parties, including investors, creditors and the government (Rizvi, Yarovaya, Mirza, & Naqvi, 2022).

4.2.1 Discounted Cash Flow (DCF) with Free Cash Flow to Firm (FCFF)

The movement of Free Cash Flow to Firm and Earnings before the Covid-19 pandemic and after the peak of the Covid-19 pandemic for the three issuers will influence the issuers' future projections. The Discounted Cash Flow (DCF) method is a company valuation method used throughout the world and

is accepted by experts (Başci, 2019) both academics and practitioners (Panigrahi, Vachhani, & Sisodia, 2021). Intrinsic value is obtained from the equity value in each scenario divided by the number of shares outstanding. Below is presented the intrinsic value of the results of data processing and analysis with DCF-FCFF:

Table 15. Summary of DCF-FCFF Analysis Results

A. SILO						
Before Covid-19	**SILO Intrinsic Value**	**Price (31 Dec 2019)**	**Difference**	**Valuation**	**PBV analysis**	**PER analysis**
Optimistic	919	875	5,03%	*Undervalued*	*Undervalued*	*Undervalued*
Moderate	789		-9,83%	*Overvalued*	*Undervalued*	*Undervalued*
Pesimistic	492		-43,77%	*Overvalued*	*Undervalued*	*Undervalued*
After Covid-19	**SILO Intrinsic Value**	**Price (31 Des 2022)**	**Difference**	**Valuation**	**PBV analysis**	**PER analysis**
Optimistic	1.383	1220	13,36%	*Undervalued*	*Undervalued*	*Undervalued*
Moderate	1.119		-8,28%	*Overvalued*	*Undervalued*	*Undervalued*
Pesimistic	791		-35,16%	*Overvalued*	*Undervalued*	*Undervalued*
B. MIKA						
Before Covid-19	**MIKA Intrinsic Value**	**Price (31 Des 2019)**	**Difference**	**Valuation**	**PBV analysis**	**PER analysis**
Optimistic	2.446	2.660	-8,05%	*Overvalued*	*Overvalued*	*Overvalued*
Moderate	2.180		-18,05%	*Overvalued*	*Overvalued*	*Overvalued*
Pesimistic	1.411		-46,95%	*Overvalued*	*Overvalued*	*Overvalued*
After Covid-19	**MIKA Intrinsic Value**	**Price (31 Des 2022)**	**Difference**	**Valuation**	**PBV analysis**	**PER analysis**
Optimistic	2.976	3.190	-6,71%	*Overvalued*	*Overvalued*	*Undervalued*
Moderate	2.836		-11,10%	*Overvalued*	*Overvalued*	*Undervalued*
Pesimistic	2.093		-34,39%	*Overvalued*	*Overvalued*	*Undervalued*
C. HEAL						
Before Covid-19	**HEAL Intrinsic Value**	**Harga (31 Des 2019)**	**Difference**	**Valuation**	**PBV analysis**	**PER analysis**
Optimistic	861	728	18,27%	*Undervalued*	*Overvalued*	*Undervalued*
Moderate	813		11,68%	*Undervalued*	*Overvalued*	*Undervalued*
Pesimistic	673		-7,55%	*Overvalued*	*Overvalued*	*Undervalued*
After Covid-19	**HEAL Intrinsic Value**	**Price (31 Des 2022)**	**Difference**	**Valuation**	**PBV analysis**	**PER analysis**
Optimistic	1.622	1.550	4,65%	*Undervalued*	*Overvalued*	*Undervalued*
Moderate	1.601		3,29%	*Undervalued*	*Overvalued*	*Undervalued*
Pesimistic	1.066		-31,23%	*Overvalued*	*Overvalued*	*Undervalued*

As one of the most recognized valuation methods, Discounted Free Cash Flow (DCF) is widely used in assessing the real value of companies, including in determining share prices, conducting mergers and

acquisitions, financing planning, tax analysis, and providing views to shareholders who wish to sell their shares (Wang, 2022).

According to the DCF approach, an increase in company value occurs when cash flow, especially Free Cash Flow, increases. A study by Yousef and Ojah (2022) highlights the statistically significant impact of free cash flow on company value. Using the Free Cash Flow to Firm (FCFF) approach is accurate if it is supported by solid assumptions and projections. In the practical world of companies, FCFF is a common choice because it allows analysis to be carried out from the perspective of all company stakeholders (Mielcarz & Mlinarič, 2014).

Based on the analysis carried out and the summary which can be seen in table 15, it can be seen that there is no difference in the share valuation of the 3 hospital issuers as the object of research. However, the intrinsic value is different from the price of outstanding shares in the period before Covid-19 and after the peak of Covid-19. SILO issuers in the optimistic scenario in both periods are always undervalued. Meanwhile, in the moderate and pessimistic scenarios for both periods before Covid-19 and after Covid-19, SILO is in an overvalued condition.

For MIKA issuers, in the optimistic, moderate and pessimistic scenarios in both periods they are always in an overvalued condition. Meanwhile, the HEAL issuer for the optimistic and moderate scenarios has a value higher than the market price so it is undervalued for both periods, both before and after the peak of Covid-19. Meanwhile, for the pessimistic scenario in both periods, HEAL is always in an overvalued condition.

4.2.2 Relative Valuation dengan Price to Earning Ratio (PER) and Price to Book Value (PBV)

Estimating share value using valuation ratios is a common practice in conducting company valuations. Apart from the Discounted Cash Flow (DCF) method, analysts often utilize valuation ratios, which are then used to evaluate companies and provide recommendations to investors (Schueler, 2020). Therefore, apart from the DCF approach, the relative valuation method is also used to determine the intrinsic value of shares. This method involves comparing the Price to Earnings (PER) and Price to Book Value (PBV) ratios of a company with the market PER and PBV values of similar companies in the same industry. The results of Relative Valuation (RV) calculations using PER and PBV are then presented in table 16 to provide further insight.

Table 16. Summary of Relative Valuation Analysis Results

company	Before Covid-19				After Covid-19			
	PER	**PER Industry**	**PBV**	**PBV Industry**	**PER**	**PER Industry**	**PBV**	**PBV Industry**
SILO	1,6	-33	1,9	2,84	16,1	128	2,25	3,75
MIKA	11,8		7,91		35,8		7,41	
HEAL	3		3,12		13,8		3,94	

Based on SILO's PBV calculations before and after the Covid peak it was always below the industrial PBV, namely 1.9 below 2.84 and 2.25 below 3.75 respectively. Meanwhile, MIKA's PBV has always been above the industry, namely 7.91 above 2.84 in the period before Covid-19 and 7.41 above 3.75 in the period after the peak of Covid-19. For HEAL, its PBV is only slightly above the industry for the pre-Covid-19 period, namely 3.12 above 2.84 and 3.94 above 3.75 after the Covid-19 peak.

PER calculations show a significant increase in industry PER from -33 to 128. This shows that in general companies in the health sector have experienced an increase in market prices and also that profits have been positive. PER for the three companies also increased, namely SILO (1.6 to 16.1), MIKA (11.8 to 35.8), and HEAL (3 to 13.8). However, this PER figure is still below the industry PER which reached 128 after the peak of Covid-19.

4.2.3 Valuation Conditions for Hospital Issuer Shares Before and After Covid-19

The research results show that using the Discounted Cash Flow (DCF) method with a focus on Free Cash Flow to the Firm (FCFF) MIKA shares do not experience changes in conditions because in the three scenarios (optimistic, moderate and pessimistic) they are always in an overvalued condition. However, for HEAL and SILO issuers, before Covid-19, the optimistic scenario was always in an undervalued situation in the period before and after Covid-19. While conditions were moderate, after the peak of Covid-19 it changed from undervalued to overvalued. Although there was an increase in valuations as a result of rising earnings following the impact of Covid-19 in Indonesia, the increase in share prices appeared to be in line with this increase, indicating that the market did not show signs of excessive optimism regarding hospital stocks in that period.

Relative assessment of hospital stocks involves comparing the company's Price to Earnings (PER) and Price to Book Value (PBV) ratios with the PER and PBV values in similar industries. In the relative valuation analysis, it can be seen that the company's PER and PBV have increased, and this phenomenon also occurs in industrial PER and PBV. This increase may reflect the positive impact of rising earnings in the hospital sector as a whole, which influences the valuation of individual stocks and the industry at large. However, it is important to note that these valuation results do not indicate excessive optimism for hospital issuers, because the increase in hospital share valuations is in line with improving financial performance and does not reflect an imbalance. Thus, the combinative analysis of the DCF method and relative valuation provides a more comprehensive understanding of the dynamics of hospital stock valuations during the post-peak period of the Covid-19 pandemic.

5. Conclusion

5.1 Conclusion

Based on analysis using the DCF-FCFF absolute valuation method and relative valuation with PER and PBV of shares in companies in the health sub-industry (hospital managers) it can be concluded as follows:

1. There has been an increase in the intrinsic value (value per share) of SILO, MIKA and HEAL issuers from the period before Covid-19 and after the peak of Covid-19 in either the pessimistic, moderate or optimistic scenarios.
2. This increase in intrinsic value is also followed by an increase in share prices so that there is no change in terms of valuation in the three scenarios.
3. In the Optimistic scenario, before and after the peak of Covid-19, SILO and HEAL are undervalued, while MIKA is overvalued.
4. In the moderate scenario, in the period before and after Covid-19 SILO and MIKA were in an overvalued condition, while HEAL was in an undervalued condition.
5. In the pessimistic scenario, in the period before and after the peak of Covid-19, SILO, MIKA, and HEAL are in an overvalued condition.
6. In the relative valuation analysis, there was an increase in PER for SILO, HEAL, and MIKA before and after the peak of Covid-19 and was within the industry range so it was valid.
7. In the relative valuation analysis, the PBV of SILO and HEAL has increased while the PBV of MIKA has decreased from the period before and after the peak of Covid-19 and is in the industry range so it is valid.
8. The DCF-FCFF or PER and PBV valuation results do not show excessive optimism for hospital issuers, because the increase in hospital share prices is in line with the increase in financial performance and intrinsic value of the company.

5.2 Suggestion

5.2.1 Suggestions for Future Research

1. This research focuses on the valuation of hospital companies before and after the peak of Covid-19, so the analysis does not include qualitative analysis such as the company's strategic planning to face conditions after Covid-19. Suggestions for future research could be to examine qualitative matters in the business management of hospital issuers after Covid-19 so that the research can be more comprehensive.

2. The growth applied in this research is constant growth throughout the projection period. It is hoped that future research can adopt adjusted growth to more accurately reflect the company's condition in an environment full of uncertainty.

5.2.2 Advice for Investors

Investors can see and compare the valuation of hospital issuers using the DCF-FCFF method and relative valuation (PER and PBV) before and after Covid-19. From the results of the analysis, the valuation of the three issuers has not changed much, reflecting the market reaction (increase in share prices) in response to the increase in the company's financial performance. However, before deciding to sell, buy or hold shares, investors should also consider other factors such as good corporate governance and the company's future plans because this research only uses historical data.

5.2.3 Suggestions for Companies

1. By understanding the cash flow impacts that can occur during a pandemic, companies can identify areas that require improvement or better risk management.

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