Valuing Commercial Banks in Indonesia: FCFE Model Outperforms DDM Model

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Abstract. This article aims to compare the effectiveness of two valuation models, the free cash flow to equity (FCFE) model and the dividend discount model (DDM), in valuing commercial banks listed on the LQ45 index on the Indonesia Stock Exchange. The study's sample includes five commercial banks, namely BBCA, BBRI, BMRI, BBNI, and BBTN. The research used qualitative secondary data from financial reports of the selected banks, the Indonesia Stock Exchange website, and Bank Indonesia. The study's findings suggest that both models are useful for valuing commercial banks in Indonesia. However, the FCFE model was found to provide a more precise estimation of actual market values for the selected banks. The results also indicate the potential for investors to take advantage of the growth in the banking sector, as indicated by the rising prices of bank stocks. The study's implications suggest that investors may use the FCFE model to make informed investment decisions and maximize their gains from trading bank stocks on the Indonesia Stock Exchange.

Keywords: Valuation Model · FCFE Model · Dividend Discount Model · Intrinsic Value · Market Value

1   Introduction

Technology, science, and industry drove economic growth over the past decade. As global spending and wealth rise, existing sectors are expanding while others are disappearing due to rapid social change.Financial service firms reflect a nation's prosperity, making them one of the most important sectors. Financial services failure can hurt a nation's revenue [1].

Financial service firms dominate emerging markets and make for a larger share of market value than in the US. Indonesia, a fast-growing market, has a potential capital market. The COVID-19 pandemic in the first half of 2020 caused one of the worst stock market falls in history. COVID-19 impacted most industries. BBCA, BBRI, and BMRI are the three largest commercial banks in Indonesia Stock Exchange, followed by BBNI and BBTN in the LQ45 index [2].

LQ45 index covered at least 70% of the Indonesia Stock Market's capitalization and transaction values and is regarded an accurate indicator of capital market activity because its movement is similar to the Jakarta Composite Index [3]. Stock values can rise or fall

daily. Political risk, risk-free, interest rate, and inflation can influence them. Management, performance, policies, and decisions can impact the stock price internally. Stock values may react more to external factors. Jarrett & Kyper believed market inefficiencies allow investors to earn anomalous yields based on risk [4]. To avoid blindly following and minimizing external risk, investors must consider this before buying. Value models. Because of their unique nature, financial service firms are difficult to value. This study will compare the free cash flow to equity model and dividend discount model to value financial services firms and determine which model is best for Indonesian commercial banks and at what payout ratio the DDM outperforms FCFE. Damodaran's studies suggest using dividend discount model and free cash flow to equity to value financial services firms. Basic relative valuation could support this study.

2 Literature Review

Valuing financial services companies like banks, insurance firms, and other similar organizations can be challenging for analysts due to three reasons [5]. Firstly, their businesses are complex, making it difficult to define debt and reinvestment, making cash flow estimation a challenge. Secondly, these companies are heavily regulated, and changes in regulatory requirements can significantly impact their value. Lastly, the accounting rules governing these firms are different from other firms, with assets marked to market more frequently. To estimate cash flows to equity for financial services firms, analysts like Damodaran suggest using Free Cash Flow to Equity and Dividend Discount Models.

2.1 Free Cash Flow to Equity

The cash flows left after covering all the financial requirements, including capital expenditures, debt payments, and working capital needs, are regarded as the free cash flow to equity (Damodaran, 2006; Fernández, 2002). The original Free Cash Flow to Equity is:

$$FCFE = Net\ Income - (Capital\ Expenditures - Depreciation)$$
$$- (Change\ in\ noncash\ working\ capital) + Net\ Borrowings$$

With financial service firms, the reinvestment generally does not take the form of the plant, equipment, or other fixed assets. Instead, the investment is in regulatory capital (the capital defined by regulatory authorities), which determines future growth limits. So the formula is modified to:

$$FCFE_{Financial\ Service\ Firm} = Net\ Income - Reinvestment\ in\ Regulatory\ Capital$$

The constant growth model FCFE is used when the company has constant growth but when company is assumed to have increased growth in the beginning and will be stable at another period, so we can use the two-stage growth model.

$$P_0 = PV\ of\ FCFE + PV\ of\ terminal\ price$$

$$Value\ of\ Equity = \sum_{t=1}^{t=n} \frac{FCFE_t}{(1 + K_{e,hg})^t} + \frac{P_n}{(1 + K_{e,hg})^n}$$

where $FCFE_t$ = Free cash flow to equity in year t

$$P_n = Price\ at\ the\ end\ of\ the\ high\ growth\ period$$

$$k_e = Cost\ of\ equity\ in\ high\ growth\ (hg)\ and\ stable\ growth\ (st)$$

The ending, or terminal price is calculated by using the infinite growth rate g_{stable}

$$P_n = \frac{FCFE_{n+1}}{(k_{e,st} - g_{stable})}$$

2.2 Dividend Discount Model

The assumption is that the current fair price of a stock equals the sum of all the company's future dividends discounted back to their present value. The dividend discount model uses straightforwardness and intuitive logic, as dividends are the only cash flows the investors gain from the firm. Similar to the FCFE model, the two-stage dividend discount model is used for a company that has increased growth initially and will be stable in another period. The model split between an initial forecast period of increased dividend growth and a period of stable dividend growth. The model can be expressed as:

$$P_0 = PV\ of\ Dividends + PV\ of\ terminal\ price$$

$$Value\ of\ Equity = \sum_{t=1}^{t=n} \frac{DPS_t}{\left(1 + K_{e,hg}\right)^t} + \frac{P_n}{\left(1 + K_{e,hg}\right)^n}$$

where,
$$P_n = \frac{DPS_{n+1}}{(k_{e,st} - g_{stable})}$$
where $DPS_t = Dividend\ per\ share$ in year t

$$P_n = Price\ at\ the\ end\ of\ the\ high\ growth\ period$$

$$k_e = Cost\ of\ equity\ in\ high\ growth(hg)\ and\ stable\ growth\ (st)$$

The ending, or terminal price is calculated by using the infinite growth rate g_{stable}

$$P_n = \frac{DPS_{n+1}}{(k_{e,st} - g_{stable})}$$

2.3   Related Concepts and Formulas Connected with DDM and FCFE

Discount Rate

The discount rate depends on company risk, cash flow uncertainty, and capital structure [6]. The higher the uncertainty about projected cash flows, the higher the suitable discount rate and the lower the current value of cash flows. FCFE only uses asset cost. CAPM calculates equity cost:

$$K_e = R_f + b * R_p$$

[7] CAPM assumes that the risk of giving equity to an investor is composed of diversifiable and non-diversifiable risks. The diversifiable risk consists of risks the investor can avoid by diversifying their portfolio. The non-diversifiable risk is the remaining risk that the investor cannot remove through diversification, which can also be called market risk.

Growth Rate

The valuation models imply growth rates based on company calculations and goals. The free cash flow to equity model and dividend discount model require consideration of the company's situation. When the firm grows steadily, FCFE and DDM are used. However, the firm will stabilize after a period of faster growth because it is still recovering from the pandemic. The two-stage growth equation yields FCFE and DDM.

FCFE only gauges operating asset income growth. The equity reinvestment rate and noncash return on equity form its foundations. Thus, the free cash flow to stock growth rate is:

*Expected growth rate = Equity reinvestment rate * Noncash ROE*
where,
Equity reinvestment rate $= \frac{Equity\ reinvested}{Net\ Income}$
And
Noncash ROE $= \frac{Net\ Income - After\ tax\ income\ from\ cash\ and\ marketable\ securities}{Book\ vaue\ of\ Equity - Cash\ and\ marketable\ securities}$

On the other hand, the Dividend Discount Model measures the growth in income from both operating and cash assets. In terms of fundamentals, it is the product of the retention ratio and the return on equity. The expected growth rate in the dividend discount model is therefore expressed as follows,

Expected growth rate = Retention Ratio x Return on Equity where,
ROE $= \frac{Net\ Income}{Shareholder\ Equity}$
retention Ratio $= 1 - (\frac{dividend\ per\ share}{earning\ per\ share})$

To find the present value of the terminal value. It assumes that no firm can grow forever at a rate higher than the growth rate of the economy in which it operates. So we assumed the stable growth rate to be equal to the growth rate of the economy with the calculation of this formula:

Nominal growth $= \{(1 + real\ growth)(1 + inflation)\} - 1$

Dividend Payout Ratio

[8] The dividend payout ratio is calculated by dividing total common dividends by net

income available to common shareholders or dividing dividends per share by earnings per share.

$$Dividend\ Payout\ Ratio = \frac{Dividends\ per\ share\ (DPS)}{Earning\ Per\ Share\ (EPS)}$$

2.4 Relative Valuation

[9] The relative valuation model is a going concern valuation model that estimate an asset's value relative to that of another asset.

The Price-to-earnings ratio measures its current share price relative to its earnings per share (EPS). The price-earnings ratio for a bank or insurance company is measured much the same as for any other firm.

$$Price\ Earnings\ Ratio = \frac{Price\ per\ share}{Earnings\ per\ share}$$

The price-to-book value ratio for a financial service firm is the ratio of the price per share to the book value of equity per share.

$$Price\ to\ book\ value = \frac{Price\ per\ share}{Book\ value\ of\ equity\ per\ share}$$

Since my focus is on some selected present value models, the relative valuation model will not be further discussed in this paper.

3 Methodology

This research's goal requires both deductive and inductive methods [10]. Thus, the research is not to prove or disprove theory but to use it to comprehend empirical data. Thus, abductive reasoning underlies the study method. This study compares methods to mathematically find the share price compared to the actual price, find the valuation models' weaknesses and limitations, and examine various models. Thus, this paper is mostly qualitative. Secondary data from numerous sources was used for this study.

The Indonesia Stock Exchange website provided numerical data from yearly financial statements. Risk-free rates from Bank Indonesia were also gathered. (2022). Damodaran (2022) annual risk premium studies provided risk premiums for the respective years.

This valuation is based on assumptions and projections of the company's situation and limited to 2017–2021 historic data. Discounted Cash Flow with Free Cash Flow to Equity or Dividend Discount Model share value. The method assumed and projected the company's condition to determine future free cash flow and present value.

4 Result and Discussion

This research aims to evaluate two valuation models, and the valuations will conclude if they are accurate business valuation methods and if one of the two models gives a more precise estimation of the companies' values concerning their actual market values and

Table 1. FCFE and DDM calculations

Company	Actual Price	FCFE			DDM		
		Price	%	Result	Price	%	Result
BBCA	7.975	3.805	−110%	Overvalued	3.727	−114%	Overvalued
BBRI	4.400	3.560	−24%	Overvalued	6.692	34%	Undervalued
BMRI	9.000	9.953	10%	Undervalued	16.876	47%	Undervalued
BBNI	8.260	15.615	47%	Undervalued	23.112	64%	Undervalued
BBTN	1.615	3.743	57%	Undervalued	5.148	69%	Undervalued

Table 2. FCFE, DDM and Relative Valuation

Company	PER	PBV	FCFE	DDM
BBCA	31,3	4,8	Overvalued -110%	Overvalued -114%
BBRI	21,5	2,3	Overvalued -24%	Undervalued 34%
BMRI	15,0	2,1	Undervalued 10%	Undervalued 47%
BBNI	14,1	1,2	Undervalued 47%	Undervalued 64%
BBTN	7,2	0,8	Undervalued 57%	Undervalued 69%

how accurate some basic relative valuation techniques collaborated in this study. The result of the calculation using two models are shown in the Table 1.

Some interesting findings between the valuation methods were found in this research. We compare the result with the average of the actual share prices from the last nine months of 2022, from January to September 2022. The result showed that FCFE accounted for 40% overvalued and 60% undervalued. On the other hand, DDM accounted for 80% undervalued and 20% overvalued. The lowest spread is from BMRI, which only has 10% relatively undervalued from the actual market price using FCFE, and the highest spread comes from BBCA, which is 114% overvalued using DDM. The result shows that Free Cash Flow to Equity was 50% away on average from the actual market price, while the Dividend Discount Model was 66% away on average from the actual market price. From the average results obtained, one can be tempted to say FCFE performs better than DDM. Although neither model is very accurate, the spread of the result from the models could figure the position of the company's equity value. An analysis was also made using relative valuation because the discounted cash flow and relative valuation are based on fundamental practices such as assets and earnings. Relative valuation has an emphasis on the actual market price so that it could be an effective support to the discounted cash flow valuation.

The Table 2 shows that the PER, PBV, FCFE, and DDM have the same pattern. The lower PER and PBV (which tend to be undervalued), the more undervalued the result of the intrinsic value of the companies. Based on Damodaran, Discounted Cash Flow valuation and Relative Valuation will generally yield different estimates of value for the

Table 3. The Payout Ratio, FCFE, and DDM result

Company	Payout Ratio	FCFE	DDM	The closest to actual price
BBCA	57%	−110%	−114%	FCFE
BBRI	85%	-24%	34%	FCFE
BMRI	60%	10%	47%	FCFE
BBNI	25%	47%	64%	FCFE
BBTN	10%	57%	69%	FCFE

same firms, but if the market is correct, on average, in the way it prices assets, discounted cash flow and relative valuations may converge.

In theory, FCFE works better for companies with a low payout ratio, and DDM valuation works better for companies with higher dividend payout ratios (Table 3).

In this research, I cannot conclude that FCFE works better for companies with low dividends payout ratios and DDM works better for companies with high dividends payout ratios because all of the companies, both high and low dividends payout ratios, have closer estimation to the actual market using FCFE model than DDM. However, I found the result that the lower the payout ratio, the higher price estimation of the share. In line with the logic that the lower payout ratio, the more money reinvested to the firms so it should be used to create more future value. But, i cannot see an exact ratio that works as a cut-off point for when we should use DDM and FCFE to get the most accurate valuation because there are many indicators that would suggest the company's value other than the payout ratio.

Free Cash Flow to Equity performs better than the Dividends Discount Model because the FCFE model considers more fundamental aspects than DDM, which only uses dividends. The fair value of shares calculated using the FCFE method will result in a more accurate target price [11]. The resulting price target will be close to the market's stock price following the company's fundamental aspects because the FCFE method can project the company's performance to focus on revenue or revenues and operating activities with historical and more detailed fundamental data [12]. FCFE approach produces both a lower average and smaller standard deviation than the DDM does for commercial banking industries, and [13] free cash flow to equity is the best method for assessing the fair value of a company because it uses internal data on cash flow conditions from the company. A few aspects of financial service firms can affect their value, and FCFE can perform better because it focuses more on financial services' key differences. Free Cash Flow to Equity concerns the strict regulatory constraints, how much capital they need to set aside to keep operating, and the accounting rules that differ from other industries, so the FCFE has a more pessimist estimation than DDM because it is more involved with many dimensions, likewise the risks. The Free Cash Flow to Equity has proven to be the model resulting in the most accurate share price for commercial banks.

5   Conclusions

The Free Cash Flow to Equity gave closer accuracy to the share prices than the Dividend Discount Model. Relative valuation also supports the accuracy of both models, and the result shown that the lower the price-earnings and price-to-book ratios, the deeper the company is undervalued and vice versa. I didn't find evidence that the high payout ratio works better with the Dividend Discount Model and the low payout ratio works better with Free Cash Flow to Equity since, in my thesis, both low and high payout ratios are closer to FCFE than DDM. However, I found a tendency that the lower the payout ratio, the more undervalued the company and this is very logical because the more money reinvested into the firms should be used to create more future value, so the expected return should be higher than the company with a high payout ratio. I further draw the conclusion that Free Cash Flow to Equity could deal with the uniqueness of financial services firms because the FCFE can project the company's cashflow to focus on net income and other detailed fundamentals such as reinvestment and regulatory constraints.

As mentioned previously, since the conclusions are based on a sample of five commercial banks evaluated with two valuation models, the conclusions are in no way general, but they serve the purpose of this particular research and I therefore see them as valid and reliable.

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