



Business Valuation for Investment Decision

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Abstract. This paper will be based on a mature investment market with many investors. The diversity of investment products also provides investors with various kinds of choices. This paper will start from the business valuation perspective and then determine the right investment decision and results. This article will help investors avoid high-risk investments and achieve high returns by comparing the calculated value with the current value. This paper will use the Discounted Dividend Model and Free Cash Flow method to calculate the value of a particular company, the Shanghai Pudong Development Bank. The calculation shows that the company's valuation is higher than the market value, so the company is undervalued. This paper uses two methods to calculate the business valuation and concludes. It applies theory to practice and offers realistic advice to investors. It helps companies and investors know more about the investment market and achieve their targets.

Keywords: Business valuation; investment decision making; Discounted Dividend Model; Free Cash Flow method

1 Introduction

With the development of the economy, the investment market has become more and more mature. At the end of 2012, the number of listed companies in China was 2494, but it rapidly increased to 4733 in 2022. This number ranked second in the world. At the end of 2012, the market value of China's stock market was about 23 trillion yuan. By July 1, 2022, the market value had reached 84.6 trillion yuan, almost twice that of 2012. In 2012, China's GDP was about 54 trillion yuan. Moreover, in 2021, the GDP was 114 trillion yuan, more than double. The growth of the market value of China's capital market is significantly fast. A general observation shows that the global stock market has almost tripled since 2003, with the total market price rising to \$109 trillion.

By now, the U.S. stock market is worth more than \$46.2 trillion [1]. Compared with other developed countries, the U.S. stock market has tended to outperform over the past few decades. With an 11.1% worldwide share, the European Union is the second-largest stock market, after China with 10.6%. Therefore, more and more investors are beginning to take part in the investment market nowadays. There are various investment products for investors to choose from. One of the products is called equity investment.

Equity investment is investing money in the stock market to purchase companies' outstanding shares. These shares are typically traded on a stock exchange. Many factors drive people to make equity investments. Some people want to earn income, including dividends and capital gains. Some want to gain control of assets and benefit from asset adjustment, scheduling and appreciation. Others are interested in participating in business decisions to diversify risks and identify business opportunities. Compared to other popular investment products such as bonds, commercial notes and treasury bills, the risk of equity investment is much higher, which is a typical feature. In the investment market, most investors are risk-averse. They will sacrifice part of the returns in exchange for lower risk. As a result, avoiding high-risk investments and choosing reasonable and correct investment products in equity investment are the most essential parts of investment. Investors must analyse the selected stocks before making an investment decision.

Another perspective is enterprise finance. A corporation needs financing to help it operate continuously. They have many financing approaches, which require different investment costs. For example, the pecking order theory holds that companies will prioritise using internal surplus, bond financing, and finally consider equity financing when they finance new projects. It is essential to choose a suitable approach. When the stocks are overvalued, the enterprise chooses equity finance because people are more likely to purchase them. Companies need to know whether their value is overvalued to make a reasonable choice. Therefore, they need valuation.

This research aims to provide several methods to calculate the value of the aim company for investors to help with decision-making on stocks, shares, and equity investments. This paper will provide investors with two methods of company valuation. Investors can use the methods mentioned below to analyse the investment decision-making process and then make a reasonable investment decision.

2 Methodology

This paper will use two methods to calculate the worth of the aim company. They are the Discounted Dividend Model and Free Cash Flow Method.

2.1 Discounted Dividend Model

Based on the notion that a company's current price equals the sum of all of its future dividend payments when discounted back to its present value, the dividend discount model (hereafter DDM) is a mathematical method for calculating its stock price. It aims to ascertain a stock's fair value independent of market conditions by considering factors like dividend distribution and market-expected returns. If the value established by the DDM is greater than the share price as of right now, the stock price is low and merits purchasing. On the premise that the company will consistently pay high dividends, all the money the stock can bring in is discounted from each future dividend to today. The perpetual dividend cash flow is discounted to today at the required rate of Return on capital r .

Equation (1) is the Equation of the price for one year [2].

$$P = \frac{D_1}{(1+r)} \quad (1)$$

P refers to the present value of the stock, D_1 refers to the expected dividend payout in time 1, and r refers to the discount rate of stakeholders. Equation (2) is the Equation of the price for t year [2].

$$P = \sum_{t=1}^{\infty} \frac{D_t}{(1+r_t)^t} \quad (2)$$

P refers to the present value of the stock, D_t refers to expected dividend payout in time t, and r_t refers to the discount rate of stakeholders [2].

$$r_p = r_f + \beta * (r_m - r_f) \quad (3)$$

Then, the paper will consider DDM, which is constantly growing. In this model, dividends are expected to grow constantly in perpetuity. The Equation (4) is the Equation of the dividend [2].

$$D_{t+1} = D_t \times (1 + g) \quad (4)$$

Then

$$P_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+r)^t} = \sum_{t=1}^{\infty} \frac{(1+g)^{t-1}}{(1+r)^t} D_1 = \frac{D_1}{r-g} = \frac{1+g}{r-g} D_0 \quad (5)$$

If r is bigger than g, then the Equation is the golden growth model.

A relationship between the current stock price, dividend growth rate, dividend growth rate, and predicted return is displayed by DDM using a constant growth model. Any three of the variables can be used to determine the fourth. Equation (6) is the Equation of the dividend growth rate g.

$$g = b \times ROE \quad (6)$$

Where g is the growth rate of dividends and earnings, ROE is Return on equity (in book values), and b is the Plowback or retention ratio.

Investment possibilities classified as growth opportunities yield projected returns more than the cost of capital. Growth stocks are the equities of businesses with access to expansion potential. However, growth opportunities do not equal the mere presence of “growth” (as from a positive earnings or dividends growth rate). Growth opportunities are investment projects with a positive NPV. The Equation (7) is the Equation of the price [3].

$$P_0 = \frac{EPS_1}{r} + PVGO \quad (7)$$

Where

PVGO: Net Present Value of Growth Opportunities

EPS: Earnings per share

$$\frac{P_0}{EPS_1} = \frac{1}{r} + \frac{PVGO}{EPS_1} = \frac{1}{r} \left(1 + \frac{PVGO}{EPS_1/r} \right) \quad (8)$$

Note that the price=earnings ratio (P/E) is defined as $\frac{P_0}{EPS_1}$

It follows from the equation(7) that:

- • If PVGO=0, $P_0/EPS_1 = 1/r$
- • If PVGO>0, P_0/EPS_1 Increases. This explains the popularity of the P/E ratio with analysts: P/E is a convenient way of comparing firms' growth opportunities [3].

2.2 Free Cash Flow Method

Free cash flow (hereafter FCF) represents a business's discretionary cash each year. In other words, after the company has covered all required operational expenses and capital expenditures, cash flow remains. The payments of interest are not included in the commonly used concept of free cash flow.

FCF helps investors and shareholders evaluate a company's intrinsic value and whether it can pay for future dividends stably. It is also helpful for potential shareholders or lenders to look at FCF and predict the company and how it will develop [4].

This paper will calculate the value by using Free Cash Flow for the Firm (hereafter FCFF). Here are many equivalent equations that can be used to calculate the FCFF [5].

$$FCFF = EBIT * (1 - Tax Rate) + D\&eprciation and Amortization - CapEx - \Delta Net WC \quad (9)$$

Where:

EBIT: Earnings Before Interest and Tax

CapEx: Capital Expenditures [6].

$\Delta Net WC$: Net Change in Working Capital [7].

$EBIT*(1-Tax Rate)$ is also called Net Operating Profit.

$$FCFF = NI + D\& and A + Int * (1 - Tax Rate) - CapEx - \Delta Net WC \quad (10)$$

Where:

NI: Net Income

D&A: Depreciation and Amortisation

Int: Interest Expense

$$FCFF = CFO + Int * (1 - Tax Rate) - CapEx \quad (11)$$

Where:

CFO: Cash Flow from Operations

$$CapEx = Year2 PPE - Year1 PPE + Depreciation \quad (12)$$

$$\Delta Net WC = Current Asset - Current Liability \quad (13)$$

$$Firm Value = \frac{FCFF}{WACC-g} \quad (14)$$

Interest payments and net debt increases or decreases are not taken into account for Free Cash Flow to Firm, but they are for Free Cash Flow to Equity (FCFE).

2.3 Sample

This paper will use the example of Shanghai Pudong Development Bank Co., LTD. (hereafter SPD Bank). Approved by the People's Bank of China, it is a national joint-stock commercial bank that opened on January 9, 1993. Its head office is in Shanghai, with a registered capital of 29.352 billion yuan. In 1999, On the Shanghai Stock Exchange, it was traded. With 41 first-level branches and about 1,700 business institutions both domestically and internationally, including branches in Hong Kong, Singapore, and London, as well as domestic branches spanning all province administrative regions on the mainland, A nationwide and worldwide commercial bank business service pattern has been set up by SPD Bank. It has not only progressively encouraged the development of collectivization in recent years but also developed an extensive business pattern encompassing faith, funds, financial leasing, rural banks, foreign investment banks, money brokers, and other business forms [8].

3 Analysis and Discussion

This paper will use the two methods mentioned above to calculate the value of Shanghai Pudong Development Bank. This paper will use the statistics from SPD Bank's Annual Report 2022.

3.1 Discounted Dividend Model

Suppose the company is growing at a constant rate.

3.2 Calculate D_0

According to Equation (4), the net profit attributable to parent company shareholders after deducting non-recurring gains and losses is 50,810 million yuan. The cash dividend ratio is 20.50%. So, the gross dividend is 10416.05 million yuan. The total ordinary share capital of the company is 29,352,174,170 (up to December 31, 2022). So, the dividend per share is 0.355 yuan.

According to the Company 2022 annual profit distribution plan from the report, cash dividends of RMB3.20 (including tax) will be distributed to all shareholders for every ten shares, based on the total share capital of ordinary shares on the registration date of the profit distribution at that time. So D_0 is 0.32 yuan.

Calculate g

According to Equation (5), part of the net profit is paid as dividends, and part is reserved for the company's development. So b is 79.5% (1-20.5%).

ROE is Return on equity. Net assets attributable to common shareholders of the parent company is 587963 million yuan. So, ROE is 8.64% (50810/587963).

In the report, the weighted average Return on equity after deducting non-recurring gains and losses is 7.92%.

So, g is 6.296% ($79.5\% \times 7.92\%$).

calculate r

According to the Equation (3), r_f is 2.461%, r_m is 10%, $r_m - r_f$ Is 7.539%.

According to the Equation $\beta_a = \frac{Cov(r_a, r_m)}{\sigma_m^2}$, r_a refers to Returns on individual stocks or equity funds. r_m refers to Returns on the market.

From the financial institution, we can know that β is 0.89.

So r_p is 9.171%. ($r_f + \beta * (r_m - r_f) = 2.461\% + 0.89 \times 7.539\%$)

To sum up, under the assumption that SPD Bank is growing at a constant rate, we can calculate that.

P_0 is 11.83 yuan per share. ($\frac{1+g}{r-g} D_0 = \frac{1+6.296\%}{9.171\%-6.296\%} \times 0.32$)

Up to December 31, 2022, the share price was 7.28 yuan per share, which was undervalued.

Free Cash Flow to the Firm Model

Earnings Before Interest and Tax is 56149 million yuan. Tax expense is 14037 million yuan. Depreciation and Amortisation is 6801 million yuan. According to the Equation (12), CapEx is 24100 million yuan. Equation (13) shows that the Net Change in Working Capital is 28557 million yuan. According to the Equation (9), FCFF is 6141 million yuan. From the Internet, WACC is 9.09%.

So, according to Equation (14), the firm value is 219792.4 million yuan.

Up to December 31, 2022, the firm value was 213684 million yuan, which was undervalued.

4 Summary

In today's investment market, the companies are growing rapidly and thrivingly. The stock market is expanding all over the world. Many investors want to obtain profit and capital from the market. They make equity investments mainly for different reasons. For example, they want to earn income, gain control of assets, and participate in business decisions. For the company, they want to finance to help the business survive in the market. Against this background, investors must know the exact value of the company they want to invest in. The research question of this paper is to use different methods to calculate the value of companies, which will help investors make better decisions when investing. This paper uses two methods to explain this research question. They are the Discounted Dividend Model and Free Cash Flow Method, especially the Free Cash Flow for the Firm. This paper takes the Shanghai Pudong Development Bank as the sample. This paper uses statistics from the annual report of the Shanghai Pudong

Development Bank to analyse and calculate the situation. The result of the two methods is that the number this paper calculates is more significant than that in the stock market. This reveals that the company is undervalued. This is not a good time for equity finance. Business valuation is helpful for investors and corporate personnel to evaluate the company and its intrinsic value correctly. Then, people can establish the basis for pricing various transactions. Adopting business valuation can assist a firm in becoming a leading corporation in the capital market as well as aid in the construction and growth of the company's core competitiveness. The financial model and the company's valuation are not the end goal but the essential tools people need to achieve the goal.

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