

Analysis of Intrinsic Stock Value Based on Discounted Cash Flow (DCF) Model -- Take China Construction Bank (601939) as an Example

Junliang Qian^{1, *}, Qinzhe Tang²

¹English Department of the High School Affiliated to Nanjing Normal University, Nanjing, China

²International Department of Changjun Middle School, Changsha, China

*Corresponding author: 100543@yzpc.edu.cn

These authors contributed equally.

Abstract. The DCF model is a simple and effective way to predict the intrinsic value of a stock by discounting future dividends. In this paper, China Construction Bank is used as the research object and valued by the DCF model [1]. The research results show that the current share price of China Construction Bank is undervalued, and with a large gap between the stock price seen by the public and the true intrinsic value of China Construction Bank, there is still plenty of room to go in the decades to come. so it is recommended to increase the stock to wait for future gains [2].

Keywords: Dividend discounting model, intrinsic stock value, rational investment

1. Introduction

In the current society, with the rise of internet finance such as Alipay, WeChat and Meituan, the traditional business of banks has been greatly challenged. Whether commercial banks have investment value has been questioned by the public. This paper addresses this situation by selecting China Construction Bank as a representative and using the DCF model to objectively assess its intrinsic value. Investors can use the DCF model to discover the intrinsic value of stocks and make scientific judgments for investment decisions, which has important theoretical significance for investors' rational decision-making and scientific investment. As a large state-owned bank in China, China Construction Bank has branches and subsidiaries in 29 countries and regions, and its businesses include funds, leasing, property and casualty insurance, investment banking and trust, etc. It has a global presence and is a truly international group [3]. Therefore, the use of DCF models to value China Construction Bank shares and determine whether they have investment value is of great practical importance to investors in how to make scientific decisions when selecting other stocks. Meanwhile, in 2022, the third year under the epidemic, the national economy in general showed a turnaround towards a positive development trend. However, there are still some unfavorable factors in China's macro environment. As a result of the epidemic, domestic consumer demand is severely lacking and the consumption rate of residents has dropped significantly, increasing the potential for financial risks. In summary, China's economy is showing a rebound and stable development trend. In such a general environment, there are good prospects for profit by making appropriate investments in China Construction Bank [4].

2. Research Methodology

2.1 Discounted Free Cash Flow Model

Relative valuation method and absolute valuation method are two approaches to valuing listed companies. P/E valuation method and P/N valuation method are mainly included by the relative valuation method, these methods are simple and easy to understand, very easy to get started and very fast to operate, but can only play a minimal role in reflecting the future changes in the fundamentals of the stock [5]; there are several value models that are widely used in the financial sector, the dividend discount model and the free cash flow model are the absolute valuation method that are most

often used by people to The free cash flow valuation method is more scientific and widely used, and the dividend discount model is not comparable to it. Analyzing its internal and external value can be achieved by forecasting a company's future free cash flows. the DCF approach simply means that the cash flows a company realizes in future periods are reduced to its current value. The DCF model can be used to assess the value of a company. There are three prior conditions for the use of this model: firstly, the ability of a company to continue to survive for a long period of time, which is fundamental to assessing the intrinsic value of a company; secondly, the free cash flow of the company, mainly in terms of the cash flow generated from operating activities that make up this money, The best outcome for assessing a company's ability to continue as a going concern is to generate a significant amount of free cash; thirdly, the weighted average cost of capital rate, the key to the outcome of the discount rate assessment is the appropriate choice and the selection of a reasonable discount rate is key to the reasonableness of the assessment results. Accordingly, the general formula for the dividend discounting model is as follows:

$$DPV = \frac{FV}{(1+r)^n} \quad (1)$$

DPV is the discounted present value of future cash flows

FV is the face value of cash flows in future periods

r is the interest rate or discount rate

n is the number of years until the future cash flows occur

3. Intrinsic Value Analysis

Due to the outbreak of the epidemic in 2020, revenue in the last three years was affected by the general environment and national epidemic prevention and control policies, so we selected data from 2014-2018 for analysis to draw relatively accurate conclusions. The free cash flow of China Construction Bank was first calculated [6].

Table 1. Free cash flow is summarized in table 1

Number of years	2018	2017	2016	2015	2014
Free cash flow(One million yuan)	595048	56827	854790	604905	281461

Number of years	2013	2012	2011	2010	2009
Free cash flow(One million yuan)	7523	333874	101702	238909	401534

China Construction Bank's average free cash flow for the previous ten years was \$347.6 billion. Setting China Construction Bank's future free cash flow at a conservative 70% of the ten-year average free cash flow is calculated to be \$243.3 billion. The table below shows China Construction Bank's revenue growth rate and net profit growth rate [7].

China Construction Bank's average free cash flow for the previous ten years was \$347.6 billion. Setting China Construction Bank's future free cash flow at a conservative 70% of the ten-year average free cash flow gives a calculated free cash flow of \$243.3 billion. The table below shows China Construction Bank's revenue growth rate and net profit growth rate [8].

Table 2. Revenue growth and net profit growth is summarized in table 2

Financial ratios	2018	2017	2016	2015	2014
Growth rate of operating income(%)	5.99	2.74	-0.02	6.09	12.16
Net profit growth rate(%)	5.11	4.67	1.45	0.14	6.14

Financial ratios	2013	2012	2011	2010	2009
Growth rate of operating income(%)	10.39	16.03	22.75	21.07	-0.12
Net profit growth rate(%)	11.12	14.13	25.52	26.31	15.29

China Construction Bank is conservatively estimated to have a growth rate of 0 over the next 10 years and 0 after 10 years because of its large volume, taking a discount rate value of 6%. The free cash flow is then discounted. In the first year it is \$229.5 billion. The second year is \$216.5 billion. And so on. The discounted value of the free cash flow is shown in the last row of the chart and calculating the combined value for each year of the decade gives an answer of a total of \$179.07 billion [9]. The calculation through perpetual annuities equals \$4,055.0 billion, which is discounted to \$2,264.3 billion. Adding the calculated discounted value of free cash flows for the next 1-10 years, \$179.07 billion, and the discounted value of free cash flows for year 11 all the way to the future, \$2,264.3 billion, the total sum is \$4,055 billion. So, \$4,055.0 billion is the intrinsic value of CCB now [10].

Table 3. Forecast free cash flow for the following year is summarized in table 3

Number of years	1	2	3	4	5
Free cash flow	24330000				
R	1.06^1	1.06^2	1.06^3	1.06^4	1.06^5
Discounted free cash flow	22952830.2	21653613.4	20427937.2	19271638.8	18180791.3

Number of years	6	7	8	9	10
Free cash flow	24330000				
R	1.06^6	1.06^7	1.06^8	1.06^9	1.06^{10}
Discounted free cash flow	17151689.9	16180839.6	15264943	14400889.6	13585744.9

A comparison of the calculation result of \$4,055 billion with China Construction Bank's current market capitalization of \$1,810 billion shows that China Construction Bank is significantly undervalued. More intuitively, dividing CCB's intrinsic value of \$4,055 billion by CCB's total number of shares of 2,510,097 million gives an intrinsic value of \$16.22 per share, which when compared to CCB's stock closing price of \$7.25 on July 19, 2019, shows that the company is severely undervalued. So, for value investors, the margin of safety is high and it is an underlying worth considering for investment [11].

4. Conclusion

An analysis of CCB's equity capital value using the DCF model shows that CCB has an intrinsic value of \$4,055 billion and an intrinsic value of \$16.22 per share, while the market price is around \$7.25, which is lower than the intrinsic value, indicating that CCB is undervalued and therefore CCB has investment value. At the same time, the actual performance of China Construction Bank in 2021 also reflects this. Despite a very unfavorable economic environment in 2021, with the world being

affected by the new crown, CCB still achieved cumulative operating income of RMB824.25 billion in the year, an increase of 9.1% compared to the same period in previous years, cumulative net profit of RMB303.91 billion, an increase of 11.1% compared to the same period in previous years, and total assets exceeding the RMB30 trillion mark, a growth rate of 7.5% compared to last year; last year CCB grew rapidly in terms of operating income and net profit, with a gap of only RMB36.6 billion and RMB34.4 billion respectively with ICBC, while in FY2020 China Construction Bank lagged behind by RMB44.3 billion and RMB44.2 billion respectively, with China Construction Bank reducing the gap by RMB8 billion in a year's time. At this rate of growth in the next three years, there is a high probability that China Construction Bank will overtake ICBC and become the number one bank in the universe. This further illustrates that the market value of a listed company is determined by its intrinsic value. This shows that China Construction Bank has the momentum and potential for continuous development, which provides the conditions to support the intrinsic value of China Construction Bank. From the analysis of the intrinsic value of China Construction Bank's shares, It reveals that investors can use the discounted method to assess the intrinsic value of a stock in a comprehensive manner when selecting it for investment, and that the main factor affecting the market value of a stock is the intrinsic value of this stock and not other factors. If the market value of a stock is lower than the intrinsic value, it is known that the stock is undervalued and the investor may prefer to invest in this stock after a comprehensive consideration because the stock has investment value; conversely, if the stock is overvalued, it does not have investment value. Therefore, only when intrinsic value is discovered can investors avoid blind investment and achieve rational and scientific investment.

References

- [1] Sun terrace. DCF model application in Yangtze power company valuation model [J]. Journal of cooperation in economy and technology, 2022 (6): 115-117. The DOI: 10.13665/j.carol carroll nki hzjjykj. 2022.06.047.
- [2] DAI Yuyao. Analysis of Securities Value Based on DDM Model: A Case study of China Merchants Bank (600036) [J]. Times Finance, 2017(02): 120-121.]
- [3] XIE Chenyu. Analysis of stock Value Based on DDM Model and Relative Valuation Method: A Case study of Minsheng Bank (600016) [J]. Modern business, 2020 (12): 91-92. The DOI: 10.14097/j.carol carroll nki. 5392/2020.12.041.
- [4] Kruschwitz L, Löffler A. Discounted cash flow: a theory of the valuation of firms [M]. John Wiley & Sons, 2006.
- [5] French N, Gabrielli L. Discounted cash flow: accounting for uncertainty [J]. Journal of Property Investment & Finance, 2005, 23(1): 75-89.
- [6] Steiger F. The validity of company valuation using Discounted Cash Flow methods [J]. arXiv preprint arXiv:1003.4881, 2010
- [7] Lundholm R, O'keefe T. Reconciling value estimates from the discounted cash flow model and the residual income model [J]. Contemporary Accounting Research, 2001, 18(2): 311-335.
- [8] Plenborg T. Firm valuation: comparing the residual income and discounted cash flow approaches [J]. Scandinavian Journal of Management, 2002, 18(3): 303-318.
- [9] Berkman H, Bradbury M E, Ferguson J. The accuracy of Price-Earnings and discounted cash flow methods of IPO equity valuation [J]. Journal of International Financial Management & Accounting, 2000, 11(2): 71-83.
- [10] Jennergren L P. A tutorial on the discounted cash flow model for valuation of companies [J]. SSE/EFI Working paper series in business administration, 2011 (1998): 1.
- [11] Smith L D. Discounted cash flow analysis methodology and discount rates [J]. 2002.