Evaluating the Efficiency Between Discounted Cashflow Valuation and Residual Income Valuation
Using Australia and New Zealand Banking Group as an Example

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ABSTRACT

In this paper, we have investigated the efficiency of two valuation models, discounted cashflow method and residual income method respectively. To prove the reliability and accuracy of the result shown in this essay, we will take Australia and New Zealand Banking Group as an example. Through these two approaches, we have systematically investigated the estimated share price under the same prediction on the figures for the balance sheet and the income statement. Under the model of discounting the cashflows, the share price is expected to increase in the projected years, which shows great potential for profit-making. However, the model of discounting the residual income shows a reverse effect that infers a decrease in the price per share. After analysing and comparing the results of the two methods with current conditions, the residual income model is recognized as the more accurate way to forecast financial performance. Therefore, the investors may use this model to foresee performance and make investment decisions on ANZ or other similar banks, such as Commonwealth Banking and Westpac Banking.

Keywords: Discounted cashflow valuation, Residual income model, Firm valuation techniques

1. INTRODUCTION

Through the estimation process, this essay will recognize the data from 2015 to 2018 as the historical numbers, which offers a tendency for the future year between 2019 and 2021. What's more, the result of the continuing value of this corporation will also refer to the data of the past years. Since the COVID-19 outbreak ruins the global economy from 2020 to 2021 which may still have a long-lasting effect on the marketplace, as the figures across these two years are negatively affected by this pandemic, they can't provide a relatively fair view of the normal economic conditions. Therefore, we won't use the data for the latest years as the historical data. Moreover, the share price in 2019 has already been observed, so we could make a comparison between the real data and the measured one, and concluded which method is more efficient.

Predicting ANZ is necessary to investigate the economic conditions of the entire bank industry during these years to avoid unpredictable elements which may affect the estimations. Reports from the Reserve Bank of Australia across the past years shown, the Australian banking industry has a great defensive mechanism throughout the world. There are two main aspects involved. The first is that the industry has a great capital level. Also, the government continues the policy of decreasing international lending since 2015, which effectively weakened the risk from the possible fluctuations in the global economy. What's more, the regulation system in Australia is more developed and advanced than most countries, providing strong support during a global financial crisis and maintaining a rather sturdy Australian economic market. And it is worth mentioning that the Reserve Bank of Australia would act on misconducting behaviors promptly. When banks do not represent the best interest of the clients, the royal banking commission would take measures to stop the situations.

In recent years, many research papers and articles dedicated to finding out the more accurate estimation methods to reduce errors. There is no doubt that these research papers provided new perspectives to get better estimations, however, it isn't easy to implement those methods. For example, some require a lot of time and money, others lack focus and consistency when it comes to a particular industry.

AP	545450	567328	595611	618150	627422	639971	655970
Short-term debt	29327	23348	13458	21585	21415	21247	21080
Long-term debt	83007	89696	94515	99594	105570	111904	118618
Total liabilities	832547	856942	838251	883241	901248	919622	938370
Total equity	57353	57927	59075	59383	60077	60778	61488

2.2.3. Predictions for tax rate

According to the forecast from the balance sheet, using the same method of prediction, the accounts information for tax expenses and profit before tax is predictable. Therefore, the effective tax rates for the corporation are calculated as 29%, 30%, 31% and 28% among the early four years, inferring the average tax rate of 30%. As a result, the forecasted tax rate of the expected years will remain the same at 30%.

2.2.4. Predictions for depreciation & PPE

Based on the previous trend, depreciation expense and PPE are projected to have prospective rates of 15% and -6% respectively. Hence, the predictions of the depreciation will be reported at 1374 million, 1574 million and 1803 million from 2019 to 2021. Meanwhile, PPE values in the future will be 1721 million, 1616 million and 1517 million.

2.2.5. Free cash flow to the firm & Free cash flow to equity

The formula for calculating the free cash flow to the firm:

$$FCFF = EBIT + Depreciation - Operating\ taxes - Change\ in\ Networking\ Capital - Capital\ expenditures$$
(1)

Combining all estimated numbers from the income statement and balance sheet with Equation (1), FCFF for ANZ in the forecasting years will be 16,101 million, 18,112 million and 17,638 million.

The formula for calculating the free cash flow to the equity:

$$FCFE = FCFF - Interest\ expense \pm Other\ income\ or\ expenses - Nonoperating\ taxes + \Delta\ Short\ \&\ Long\ term\ debt$$
(2)

To figure out the change in debt for the foreseen years, it is necessary to find out the sum of Δshort-term debt and Δlong-term debt. Based on the relevant data, the anticipated FCFE by using Equation (2) in the coming periods will be 5919 million, 8212 million and 8040 million.

2.2.6. Rate of return on equity & Long-term growth rate

The capital asset pricing model (CAPM) will be used for determining the rate of equity:

$$Ri = Rf + \beta i \times (Rm - Rf)$$
(3)

We have researched the official website of ANZ or other online authoritative websites to get reliable past data for our calculation process. Firstly, the ratio of the Australian 10-year Government Bond is assumed to be the risk-free rate, at approximately 1.01%. Besides, the evaluations of the forecasted market return and the beta for the bank are at 7.75% and 1.27%. Therefore, the return on equity is reckoned at 9.57% based on Equation (3). And the growth rate in long run is equal to the growth rate of GDP in Australia at 1.4%.

2.2.7. Equity value & Market price comparison

When the return rate on equity is calculated at 9.57%, the assumed present value can be discounted back by using this rate, generating the future values at 5402 million, 7495 million and 7338 million from 2019 to 2021. After foreseeing a reasonable growth rate and associating with Equation (4):

$$Continuing\ value = \frac{FCFE_{N+1}}{(re-g)}$$
(4)

The figure for the ongoing free cash flow after 2021 will be at 74816 million after the discounting. Thus, the present value of equity after 2018 is calculated as the sum of FCFE and continuing value of 95051 million dollars.

As ANZ issues 2830 million shares, the estimated price per share under the discounted cashflow valuation is $33.59. However, the actual price at the end of 2018 is $28.74, which is lower than the expected number. Hence, this method shows that the current price of ANZ is undervalued, having a great potential for making more profits.

3. RESIDUAL INCOME MODEL

3.1. Introduction of the method

The residual income model refers to earning based valuation, which considers the equity value as the total amount of book value of ordinary shares and the present value of the expected residual income [4]. There are

limitations to this method. For example, the accounting policies may bring fluctuation to the numbers. However, this issue will be corrected by itself in a long run. In some cases, the management will distort the earnings to achieve management goals, but this problem won't last for a long time [5]. As a result, for a long-term period, this model is considered reliable.

3.2. Calculation

The first step is to forecast the essential accounts in the income statement and balance sheet, the same as the discounted cashflow method. Therefore, the information can be directly acquired from the previous forecasting. Additionally, to get the final result from the residual income model, two formulas will be used:

$$E_0 = BV_0 + \sum_{n=1}^{N} \frac{[NI_n - (BV_{n-1} \times r_e)]}{(1+r_e)^n} + \frac{CV_N}{(1+r_e)^N} \tag{5}$$

$$CV_N = \frac{[NI_N \times (1+g) - (BV_{N-1} \times r_e)]}{(r_e - g)} \tag{6}$$

As the data shown in Table 1, the estimation in net income is 6400 million, 6151 million, 5911 million and 5680 million between 2018 and 2021. Also, the data for the carrying value of equity can be acquired from Table 2, reckoning at 59383 million, 60077 million, 60778 million and 61488 million for the last four years. After gathering the information, the next step is to confirm the residual income through each period. The formula for residual income is:

$$Residual\ income = NI_n - BV_{n-1} \times r_e \tag{7}$$

Consequently, the total residual income is at 458 million after the processes of discounting and adding all anticipated numbers together.

Table 3. Residual income for ANZ (all numbers in millions)

	2018	2019	2020	2021
Net income	6400	6151	5911	5680
Book value of equity	59383	60077	60778	61488
Residual income	/	468	162	(136)
Discounted residual income	/	427	135	(104)
Total residual income	/	/	/	458

Similarly, after providing the long-term growth rate and the return rate in the first section, it is much easier to calculate the figure for the current continuing value with Equation (6), at nearly -529 million. Since the book value of equity in 2019 is revealed at 60077 million, the final result of total equity is predicted at 60007 million. With the same shares outstanding, the price for each share will be $21.20 under the second model. Thus, under this model, ANZ won't be worth investing in because the share price is expected to decrease in the next few years.

4. ANALYSIS OF TWO METHODS

The market value of the share for ANZ at the end of 2018 is $28.74. According to the former calculation, when applied cashflow valuation, the price per share will be $33.59, indicating a positive shift and a probable investment for the public. However, the share price is estimated at $21.20 when the residual income model is used for assessment, which shows a reverse tendency compared to the first approach. To find out the more accurate way of valuing this corporation, Fig.1 shows the real change during the year 2019:

Figure 1 Share price for ANZ during 2019

From the information shown in Fig.1, the highest share price during this year is around $26, being lower than the figure in 2018. The analysis above showcases two results. Firstly, ANZ isn't worth investing in 2019, so the residual income model makes a correct estimation of ANZ's future performance. Second, we can use the average growth rate from the past years as the expected growth rate to foresee the figures for the next three years. Although it is a simple way that may contain some errors, still it provides the right direction for the investors to make their investment decisions.

Several reasons can explain why chooses the earning-based valuation is the best method. The first viewpoint illustrates that it is suitable for companies that perform stably and has a steady dividend [6].
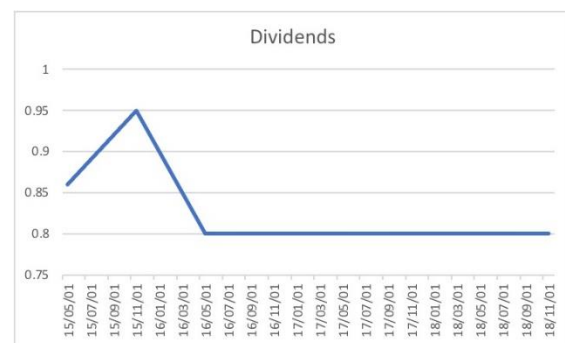

Figure 2 Dividends for ANZ from 2015 to 2018

From Fig.2, it is noticed that the dividends for ANZ stay pretty steady through the preceding years. As a

result, ANZ satisfies the range of application for the residual income model. The other four major banks in Australia, such as Commonwealth Banking or National Australia Bank, have similar conditions in dividends as ANZ. Therefore, they can also apply this model as their measurement tool.

The second point is that although the theory of the DCF model is simple, it is complex and has a great restriction [7]. From the calculation process, the free cash flow estimation requires more computations to prevent potential errors, comparing to the discounted cashflow method whose earnings-based can be taken from the income statement or balance sheet directly and ignoring the steps of calculating the free cash flow to the firm and the free cash flow to the equity. This paper shares the same conclusions found in French and Gabrielli's article, in which the uncertainties will affect the discounted cashflow model during estimation [8]. As a consequence, the output result will reflect these input errors and the users will not get a helpful suggestion from this approach.

5. CONCLUSION

From the calculation results of each method, the residual income model provided a better prediction on estimation for ANZ. For further exploration, the professionals illustrate that the residual income model is more appropriate for stable organizations that have similar characteristics as ANZ. Besides, there are more measuring errors during the calculation through the discounted cashflow model. In conclusion, the residual income model is a better choice for ANZ and some other banks which has the same feature as ANZ.

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