# Enterprise Value Assessment of Wuliangye Based on Improved Residual Income Model

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**Abstract:** The liquor industry not only has deep historical information and extensive social influence, but also has become an important part of China's economic market, making a significant contribution to the national and local financial revenue. As a representative enterprise of liquor industry, the correct valuation of Wuliangye is helpful for investors to make decisions and managers to improve the system. Enterprise value assessment is a comprehensive work, aiming at an in-depth analysis of the market value of a company. Among the traditional valuation methods, cost method, market comparison method and income forecast method are the most common evaluation methods. This paper selects the residual income model under the income method to estimate the intrinsic value of Wuliangye Group, and improves the accuracy of the model by introducing DuPont analysis system and limited forecasting period. The results show that the results of the improved residual income model can better reflect the value of the enterprise, and can put forward suggestions for the healthy and sustainable development of the enterprise.

***Keywords*:** residual income model, wuliangye, business valuation

## 1. Introduction

The development of the liquor industry in China has a long history. After the accumulation of time, liquor has become an indispensable beverage in daily social life, and the liquor industry also occupies an important position in China's economy and culture.

At present, the market of liquor industry is unpredictable, due to the continuous improvement of national living standards, consumer demand also tends to diversify, high-end, liquor industry is facing many challenges and opportunities. In order to comply with the market trend, the liquor industry is also constantly innovating.

From the situation in recent years, the development trend of China's liquor industry to the good is expected to remain unchanged, and will focus on the development of three major directions from the brand, enterprise and region. Wuliangye as the liquor industry's leading enterprises, its valuation can be a comprehensive understanding of its financial situation, market prospects and other elements, to assess its current value and future growth potential, which is important for the liquor industry and other listed companies.

## 2. Related concepts and theories

Before the empirical analysis begins, this paper introduces the basic concepts and theories associated with it.

### 2.1 Enterprise valuation

Fisher made a pioneering contribution to the study of enterprise value.In his 1906 book The Nature of Capital and Income, he pioneered the "theory of the value of capital"[1], and Fisher's view that the value of an enterprise is in fact equal to the amount of future earnings that one would expect from it provides a new perspective on the assessment of the value of an enterprise. From an economic point of view, enterprise value is regarded as the value of the enterprise itself, which is numerically equivalent to the total discounted free cash flows in each future period.

Enterprise valuation is a systematic process aimed at providing a comprehensive and accurate quantitative and qualitative analysis of an enterprise. The process includes not only the accounting and evaluation of historical data, but also the prediction of future trends and potential. A business valuation is an essential part of every business and provides comprehensive information about its financial and commercial position, which is essential for investors and policy makers to make informed investment and strategic decisions.

### 2.2 Residual Income Model

The research on the residual income model first started from foreign scholars, and Preinreic[2] first proposed the related

concept of residual income in 1938. Subsequently, Edwards and Bell (1961) were the first to derive the classical residual income model, linking the intrinsic value, net assets and residual income of an enterprise and clarifying the relationship between them with formulas, laying the foundation for subsequent related research[3]. Ohlson (1995) created the residual income model, proposing to assess the value of an enterprise based on financial information[4].Subsequently, other Western scholars have discussed and researched and empirically analyzed the model as a reliable tool for enterprise valuation in practice.

**2.2.1 Residual Income**

Residual income is the net profit of the enterprise minus the necessary compensation demanded by shareholders, this indicator not only reflects the profitability of the enterprise remaining after meeting the expected income of shareholders, but also is a visual embodiment of the enterprise's ability to create value.Residual income can be expressed as:

$$RI_t = NI_t - rBV_{t-1} \quad (1)$$

Where, $RI_t$ denotes the firm's residual income in period t; $NI_t$ denotes the firm's net profit in period t; r denotes the requisite rate of return demanded by shareholders; and $BV_{t-1}$ denotes the book value of net assets at the beginning of period t.

**2.2.2 Traditional residual income model**

The residual income model suggests that the intrinsic value of an enterprise is equal to the sum of the current book owner's equity of the enterprise and the discounted value of the residual income earned in each period.This model provides a more comprehensive and accurate perspective for assessing the true value of a business, which can be expressed by the formula:

$$V_t = BV_t + \sum_{t=1}^{\infty} RI_t / (1+r)^t \quad (2)$$

Where, $V_t$ denotes the intrinsic value of the firm in period t; $BV_t$ denotes the book value of the firm in year t; $RI_t$ denotes the residual income of the firm in period t; and r denotes the requisite rate of return demanded by shareholders.

**2.2.3 Improved residual income model**

The traditional residual income model has some limitations when used, such as: the accuracy of residual income prediction is not high, the assumption of going concern can not be realized, etc. In order to improve the accuracy of the model, it can be improved by introducing DuPont's financial analysis model and the finite prediction period.The improved residual income model is:

$$V = BV_0 + \sum_{t=1}^{T} \frac{S_t \times MOS_t \times ATO_t \times EM_{t-1} - r}{ATO_t \times EM_{t-1} \times (1+r)^t} + \frac{CV_T}{(1+r)^t} \quad (3)$$

Where, S - Income from Main Operations; ATO - Total Asset Turnover, EM - Equity Multiplier, MOS - Net Sales Margin, r - Cost of Equity Capital.

# 3. Empirical analysis

This appraisal sets the base date as 31 December 2022, with 2023 as the first forecast year.

## 3.1 Prediction of the basic parameters of the residual income model

In this paper, the financial data of Wuliangye Group for the five-year period 2018-2022 is selected as the basis for forecasting each parameter variable, and the results are shown in the table as follows:

**Table 1. Forecasts for each element of the Wuliangye Group's residual income from 2023 to 2027.**

| Project | 2023 | 2024 | 2025 | 2026 | 2027 |
|---|---|---|---|---|---|
| Revenue from Main Business ( billion ) | 827.21 | 911.18 | 995.15 | 1079.12 | 1163.09 |
| Net Sales Margin | 37.85% | 38.09% | 38.31% | 38.50% | 38.68% |
| Total Asset Turnover | 48.23% | 48.23% | 48.23% | 48.23% | 48.23% |
| Equity Multiplier | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 |
| Cost of Equity Capital | 7.12% | 7.12% | 7.12% | 7.12% | 7.12% |
| Residual Income ( billion ) | 219.84 | 245.94 | 270.72 | 295.75 | 320.76 |

### 3.2 Analysis and calculation of survival value at the end of the projection period

The survival value for the forecast period in this paper is calculated by arithmetically averaging the projected residual income values from 2023 to 2027:

$$\overline{RI} = (RI_{2023} + RI_{2024} + RI_{2025} + RI_{2026} + RI_{2027}) / 5 = 270.602 billiion$$

$$CV_t = \overline{RI} \text{)(r-g} = 8673.14 billion$$

### 3.3 Estimating the enterprise value of Wuliangye Group at the end of 2022

Calculate the intrinsic value of Wuliangye Group in 2022 by substituting the forecast data in Table 1 into Equation 3:

$$V_{2022} = BV_{2022} + \sum_{t=1}^{5} \frac{RI_t}{(1+r)^t} + \frac{CV_t}{(1+r)^5} = 266.9 + 1091.34 + 6149.42 = 7507.66 billion$$

The results estimated by the model are then compared with the actual data to draw conclusions.

## 4. Conclusion

The results of the study indicate the validity of the residual income model in assessing the enterprise value of Wuliangye Group. As of 31 December 2022, the market capitalization of Wuliangye Group is 686,695 million, with an error of 9.33% from the result calculated through the residual income model, which is within the acceptable range.

At the same time, the valuation results show that the intrinsic value of Wuliangye Group is higher than the current market value, so this paper believes that the value of Wuliangye is undervalued.Based on the valuation results, this paper suggests that Wuliangye Group should adjust its operation policy so that the enterprise can develop sustainably and realise the value-added of the enterprise, and this paper also suggests that investors can buy the shares of Wuliangye at present because this stock has a strong ability to develop in the future.

Although this paper has improved the traditional residual income model, there are still some problems that need to be solved, such as: data dependence and quality problems.The improved residual income model still relies on the financial data of enterprises, and the authenticity and integrity of these data directly affect the assessment results of the model.If the enterprise has financial fraud, then the assessment results of the model will become invalid data. Moreover, when using the improved residual income model for value assessment, the model usually relies on trend analysis to predict the model parameters, and if macro policy adjustments or the instability of the enterprise's operating conditions lead to significant fluctuations in the enterprise's financial data, this will inevitably have a direct impact on the accuracy of the parameter predictions, which will in turn reduce the reliability of the overall value assessment results.Therefore, these potential external and internal risk factors must be fully considered and addressed when conducting such assessments.

Although this paper has improved on the traditional residual income model, there are still some issues that need to be addressed: data dependence, quality, and the neglect of non-financial factors all need to be improved.

## References


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