

# The Application of Price-Sales Ratio Method in S Company's Merger and Acquisition of F Company

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**Abstract.** Accurately assessing the value of the target enterprise is an important factor for the success of enterprise mergers and acquisitions. As one of the important methods of enterprise valuation, the price-to-sales ratio method adopts the operating income indicator, and uses the valuation model to obtain the market value of comparable companies and the multiple of this indicator, and then obtains the value of the target enterprise, which can reflect the business prospects of the enterprise and is widely used by the capital market. generally accepted. Based on this, this paper deeply analyzes the basic principle, applicable environment and application process of the price-to-sales ratio method and its valuation model, and applies it to the target company's valuation when S company acquires F company, and uses the price-to-sales ratio method for mergers and acquisitions. Companies that conduct valuations set an example to help them ultimately realize value appreciation.

**Keywords:** Business valuation, price-to-sales ratio method, mergers and acquisitions, market method.

## 1. Fundamentals of the price-to-sales ratio

The price-to-sales ratio method is a valuation method based on the price ratio in the evaluation method of enterprise value. The valuation model used is the ratio of the price per share to the operating income per share. Under the current situation of ever-changing enterprises and market transactions, the price-to-sales ratio method has become a common choice for value evaluation methods when companies conduct mergers and acquisitions, business expansion and other transactions due to its general applicability and stability.

### 1.1 Basic concept

The price-to-sales ratio method uses a valuation model to calculate the ratio between the price per share of the common stock and the operating income per share, and compare it with comparable listed companies or comparable transaction cases to evaluate the enterprise value. The price-to-sales ratio valuation model adopts the financial indicator of operating income, which can be expressed as the ratio of the stock market value of the evaluation object to the total operating income. The calculation formula is:

$$\text{Price to Earnings Ratio} = \text{Price per Share} / \text{Operating Income per Share} \quad (1)$$

The value of the price-to-sales ratio is related to the size of the investment value. The lower the price-to-sales ratio, the greater the investment value; the higher the price-to-sales ratio, the smaller the investment value.

### 1.2 Function of the price-to-sales ratio method

(1) The price-to-sales ratio method can reflect the investment value of a company. It can be seen from the calculation formula of the price-to-sales ratio valuation model that if the price of each stock does not rise correspondingly when the operating income increases, the price-to-sales ratio value will become smaller, indicating that the investment value of the stock is higher than the original one. If the increase in the price of each share is equal to or greater than the increase in the company's operating income, that is, the price-to-sales ratio remains unchanged or increases, it means that although the stock has increased in value, the current investment value of the stock has not increased.

If the company's operating income declines, the stock price does not fall accordingly, and the price-to-sales ratio value increases, indicating that the investment value of the stock has decreased.

(2) The price-to-sales ratio method can evaluate the quality of a company's operating income. The price-to-sales ratio valuation model is the ratio of the share price per share to the main business income per share. This model excludes the impact of non-operating income, so it is helpful to examine the stability and reliability of the company's earnings foundation. It can also accurately and effectively assess the quality of corporate earnings.

(3) The price-to-sales ratio method can determine the growth of a company. The historical changes in the price-to-sales ratio are calculated by analyzing the price-to-sales ratio valuation model. On the one hand, there are potential growth companies that have not been tapped by the market. Such companies show that their operating income has gradually increased, but their stock prices have not changed significantly. The price-to-sales ratio value gradually becomes smaller; on the other hand, for companies that have been discovered by the market, investors will give the company higher expectations, so the price-to-sales ratio value is higher than the industry average, and the market-to-sales ratio of most growth companies The rate is higher because of this.

### 1.3 Features of the price-to-sales ratio method

(1) The main advantages of the price-to-sales ratio method

Different from the price-to-earnings ratio method and the price-to-book ratio method, the valuation model used by the price-to-sales ratio method is based on operating income, and the value obtained will not appear negative, so there will be no meaningless situation. If the business is currently not doing well and profits are negative, a meaningful ratio can still be derived.

Unlike profit and book value, the operating income indicator in the price-to-sales ratio valuation model is not affected by the company's accounting methods such as depreciation and inventory, so it is not easy to be manipulated.

The value obtained by the price-to-sales ratio valuation model does not fluctuate as much as the value obtained by the price-earnings ratio method, and the changes in the value shown are relatively stable.

The price-to-sales ratio method can better reflect the changes in the company's price policy and changes in the company's strategy.

(2) Major Disadvantages of the price-to-sales ratio method

The price-to-sales ratio method is not suitable for companies with significant costs. The valuation model uses operating income as an indicator. When the company faces the problem of cost control, operating income may remain unchanged, resulting in a substantial decline in profit and book value. Therefore, for those companies with negative profits and book values, if the price-to-sales ratio method is used for evaluation, the company's costs and profits are not considered, and the resulting values may seriously mislead decision-making.

The price-to-sales ratio method is not suitable for comparisons between industries. Since investors have different expectations for performance growth in different industries, the price of each stock varies greatly among different industries. In addition, the development stage of the industry, the degree of prosperity, and the profitability of companies in the industry will also lead to huge differences in operating income between industries. Therefore, it is meaningless to compare the values obtained by using the price-to-sales ratio valuation model between industries.

### 1.4 Applicability of the price-to-sales ratio method

(1) The price-to-sales ratio method is suitable for the valuation of start-up companies. The valuation model used by the price-to-sales ratio method uses operating income as an indicator, while start-ups are in the stage of high operating income growth. Considering the high proportion of early marketing expenses, the real profitability has not been shown. The price-to-sales ratio valuation model excludes the impact of higher expense ratios, and the potential and future development of the company's business can be well predicted.

(2) The price-to-sales ratio method is applicable to sales industries. Typical representatives of the sales industry include the clothing industry, the food industry, etc. The operating conditions of these companies are directly displayed through sales, which match the operating income indicators in the price-to-sales ratio valuation model. Therefore, the price-to-sales ratio method is used for value evaluation.

(3) The price-to-sales ratio method is applicable to science and technology enterprises. These companies invest a lot in R&D and equipment in the early stage, and rely on the growth of sales in the later stage. The operating income indicator is more objective and true, and it is more stable and reliable than the earnings per share and book value, so it is more suitable for the price-to-sales ratio method for value evaluation.

## 2. The application process of the price-to-sales ratio method

The type, development degree and business maturity of the enterprise are the key factors affecting the selection of price ratio. On the premise that the target enterprise is suitable for the price-to-sales ratio method, the valuation model is used to evaluate the value.

(1) Select comparable companies. The so-called comparable companies refer to those companies with similar operating and financial characteristics, and companies within the same industry are the best candidates.

(2) Estimate the ratio value of the target company. There are two main methods for determining the price ratio value of the evaluated company: the comparable company reference method and the regression analysis method.

(3) Forecast operating income. The forecasting methods of operating income mainly include time series method, causal analysis method and cost-volume-profit analysis method.

(4) Calculate and evaluate enterprise value. The estimated value is obtained by plugging the estimated price ratio value and the forecasted operating income into the formula below, namely:

$$\text{Enterprise value} = \text{price ratio} \times \text{price ratio base} \quad (2)$$

## 3. Case application

### 3.1 M&A in general

Company S was established in 1990 and listed on the Shenzhen Stock Exchange in 2004. In 2015, S Company began to transform into a new retail model and continuously enriched the retail format. In an environment where the overall growth rate of consumption is declining, the acquisition of Company F has become an important step for Company S to promote online and offline integration.

Company F was established in 1959 and officially entered the Chinese mainland market in 1995. As of March 2019, Company F has set up more than 200 large supermarkets and 24 convenience stores in China, with about 30 million members. Before the merger, under the background that the traditional retail industry was greatly impacted by e-commerce, Company F had also actively responded, but it was still unable to reverse the continuous loss.

It took only three months from the announcement of the S company to the completion of the merger, and the process was relatively smooth and fast.

**Table 1** M&A Process

Time	M&A process
June 22, 2019	Company S signed an equity purchase agreement with Company F to purchase 80% of its equity in Company F at a consideration of RMB 4.8 billion
August 26, 2019	It passed the anti-monopoly review of the concentration of undertakings by the State Administration for Market Regulation
September 26, 2019	S Company and the transferor completed the delivery procedures for 80% shares of F Company

### 3.2 The applicability of the price-to-sales ratio

(1) This transaction is a market-oriented merger and acquisition. Company S and Company F both belong to the retail industry. The main business income largely reflects the company's operating conditions. It can be assessed from the operating income whether the company's business growth has been high, which is consistent with the operating income indicator used in the price-to-sales ratio valuation model.

(2) Company F is currently in a state of loss, with negative profits. Compared with the price-earnings ratio method and the price-to-book ratio method that are related to profit indicators, the valuation model cannot be used to calculate the results. Therefore, choosing the price-to-sales ratio method can evaluate the value of the enterprise more fairly.

### 3.3 The applicability of the price-to-sales ratio

Through the acquisition of Company F, Company S can further expand the overall layout of the Company and enhance the Company's market competitiveness and profitability. Therefore, considering the business development potential of Company F and the business synergy between the Company and the target company, this acquisition has a good prospect of integration. The valuation of this transaction refers to the valuation level of A-share listed companies in the same industry, and is ultimately determined by both parties to the transaction.

The 100% stake in Company F, the subject of this transaction, is valued at RMB 6 billion. According to the unaudited management accounting statements provided by Company F, the operating income in 2018 was approximately 29.958 billion yuan. The results of this transaction are obtained through a price-to-sales ratio valuation model:

$$\text{Price to Earnings Ratio} = \text{Price per Share} / \text{Operating Income per Share} = 0.2$$

Compared with the average price per share/operating income per share of the major A-share listed companies in the same industry in 2018 of 0.88 and the median of 0.7, the valuation level of this transaction is more reasonable.

**Table 2** Comparison of selected comparable companies

Comparable companies	2018 Equity Value/Revenue Multiple
Yonghui	1.37
Jiajiayue	1.02
Bubugao	0.38
Sanjiang	1.87
Renrenle	0.29
Zhongbai	0.32
Average	0.88
Median	0.70
Company F Valuation	0.20

### 3.4 The results of applying the price-to-sales ratio method

After the merger and acquisition activities are over, by comparing the financial indicators of the S company and the industry average, the financial performance of the S company after using the price-to-sales ratio method to evaluate the enterprise value is analyzed.

**Table 3** Price-to-sales ratio valuation comparison table

	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3
Company S	0.48	0.44	0.39	0.35	0.31	0.30	0.31
Industry average	2.82	2.51	2.71	3.48	3.36	4.05	3.97

It can be seen from Table 3 that after the merger, the price-to-sales ratio of S Company continued to decrease, and the difference between it and the industry average became larger and larger, and the investment value occupied a greater advantage in the industry.

**Table 4** Comparison of Development Capability Indicators (Unit: %)

	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3
Company S Net profit growth rate	24.39	-63.33	-109.20	-26.28	-812.32	-126.03	-100.65
Industry average	41.54	10.80	45.85	5.60	-208.04	-45.46	-30.53
Company S total asset growth rate	29.35	22.26	23.28	18.74	7.88	5.09	-5.09
Industry average	11.11	7.80	9.77	13.26	20.52	17.00	7.81

It can be seen from Table 4 that the net profit of S Company decreased after the merger. Although Company S has actively integrated the advantageous resources of Company F since the acquisition, due to the impact of the shutdown of production due to the epidemic, Company S's online and offline business volume has dropped sharply, resulting in the fact that the net profit has not achieved the expected growth trend. With the resumption of work and production at the end of March, mergers and acquisitions began to show advantages, and the net profit growth rate in the second quarter of 2020 increased significantly, indicating that S company has improved the company's development capabilities through scale expansion.

**Table 5** Profitability Index Comparison Table (Unit: %)

	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3
Company S Roe	0.17	2.63	13.09	11.20	-0.63	-0.19	0.63
Industry average	3.16	6.11	9.71	0.51	0.95	2.76	5.51

From Table 5, it can be seen that the ROE of S Company peaked in the third quarter of 2019, and then due to the overall downward trend in consumption and the impact of the epidemic in 2020, the ROE dropped to a negative value. Gradually recovered from the second quarter. After gradually adapting to the impact of the epidemic and quickly responding to the changes in consumer behavior under the influence of the epidemic, Company S has steadily improved its development capabilities. Therefore, mergers and acquisitions are conducive to the optimization of the offline layout of the S company, and have a catalytic effect on the improvement of profitability.

From the above analysis, it can be seen that although there is no obvious sign of improvement in financial performance in the short term, the acquisition of S Company has brought positive benefits to S Company in terms of market share, customer resources, logistics resources and management experience in the offline supermarket segment. This also shows that the long-term financial performance of the acquisition of S company will be improved.

## 4. Conclusions

Enterprise value assessment plays a very important role in mergers and acquisitions. In the current complex economic environment, there are various types of enterprises and transaction methods. As one of the valuation methods in the capital market, the price-to-sales ratio method is more stable and intuitive to use its valuation model to calculate the results. This paper deeply analyzes the valuation process of using the price-to-sales ratio method in mergers and acquisitions, and shows that the price-to-sales ratio method can effectively quantify the actual value of an enterprise when valuing it, which is worthy of reference and promotion.

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