

Valuation Methods in Case of Merges and Acquisitions: A Review

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ABSTRACT

Mergers and acquisitions play an important role in business valuation, which will lead to the difference of business value selection. Therefore, this paper narrows the scope of business valuation to three specific methodological fields and conducts a literature review analysis of asset-based, income/earnings-based, and cash flow-based methods. Meanwhile, the application performance, applicability and limitations are evaluated as well. It was found that most of studies were theoretical and lacked empirical evidence. Although some studies provide empirical evidence, they lack generality and further demonstration of the subdivision valuation method. To a certain extent, this paper fills in the research gap of business valuation segmentation in the case of merges and acquisitions, draws a conclusion that can eliminate regionalism and promotion, and also provides some follow-up research directions for those who need to make relevant decisions.

Keywords: “Business valuation”, “Financial management”

1.INTRODUCTION

Mergers and acquisition are ways that companies attempt to improve their competitive position in the current global market. They form one of an attractive force for enterprises, and increasingly prevails among companies. Many years the most important aims for business and enterprises are increasing revenue and gaining bigger market share in more ways, which the merges and acquisition is the one of the possible methods. The final result of merges and acquisitions is usually only one company will appear no matter how many companies access these processes before. There are tiny differences between merges and acquisition is that in merges companies usually are equality and voluntary to become one new company, but the process of acquisition means buying company might more powerful and the purchased company can be forced. However, with the final results in these processes, nowadays the difference between these two processes can be ignored, therefore the merges and acquisition are discussed

together. According to the definition of merges and acquisition, the new company take not only the properties of old one but also the liabilities. Therefore, the business valuation can be seen as the important part in merges and acquisition, and worth to research. During this process, business valuation is necessary to evaluate the profit and benefits which merges and acquisition could bring about. The wrong valuation choice can bring the exaggerated valuation. Therefore, it is important to make a decision on merges, which is the core of merges. In our review, the main aim is to explore the limitations of previous researches in the area of business valuation methods with consideration of merges and acquisition, which mainly focus on the methods of asset-based, earning/income-based and cash flow-based. Moreover, we also hope can provide some reference and suggestion for future studies in this area. There are briefly introductions for these three methods separately below.

Firstly, the asset-based valuation means that the whole calculation process is based on the assets of company to valuate on the individual or collective level, but our

research will focus on collective level because of the consideration of companies' actives—merger and acquisition. There are three main asset-based methods according to the different classification of companies' assets, which are calculating the total assets (as known as book value) based on the historical cost of company, fair value and replacement cost based on the market value of the company. The second valuation methods, income/earnings-based method, usually divided into two field, which are using the P/E ratio method and the contrast to P/E ratio—earnings yield method. Hence, in this paper, we only consider for P/E ratio method to simplify the discussion. P/E ratio, as known as the price-to-earnings ratio, means the ratio of the market value of a share to earnings per share (EPS). The higher P/E ratio can reflect higher growth's speed of companies and anticipation of investors for companies. Thirdly, For the cash flow-based valuation method, the market value of any financial instrument should be equal to its future cash flow discounted to present value according to the rate of return required by investors.

Matschke et al. concluded that in most cases, the company is valued against more than one value. The same valuation subject can have different valuation objectives. Purpose dependence is the main principle of business valuation [1]. Therefore, the different choice of different valuation methods have been studied. In the case of mergers and acquisition, there are many exciting literature to analysis in different angles, but the popular two classification is based on the region or the commercial types. Imam et al. studied the use of earning-based and cash flow-based valuation methods in UK region by interviewing the 42 analysts who are from investment bank and property management companies in the role of trade parties. They found that DCF (discounted cash flow) valuation seems like the method which analysts prefer to use and more important, but the choice of valuation method also be impacted by the subjective of analysts [2]. Therefore, they point that the study about valuation methods using should consider the external environment such as economic background and the motivations [2]. Form more macro perspective, unlike the research of Imam et al., Coady and Faseruk in 1997 compared the difference of business valuation models in developed regions and developing regions. They found that the business valuation models in developed regions are more mature and experimental than in developing regions, and the cash flow methods is easier to use and assumed as the most efficient decision index [3]. Moreover, different valuation models can be served for different motivations [3]. They thought the income/earnings-based method is more suitable for analyzing performance of management and financial situation, but the DCF is more suitable for company valuation [3]. They also stated that the except the development level, different culture also can lead difference in business valuation [3]. However, in this

research, its timeliness might need to be considered because it is far from now and the situation can change with the past of time [3]. The business types also can be the classification of research. French researched the optimal valuation models in specialized property. They pointed that in the specialist property area, the emphasis is on the market value of property [4]. They also analyzed the different valuation models but they did not conclude the single model which might be best suitable [4].

However, on the contrary of the conclusion mentioned before, some researches query the useful, validity and practicability of cash flow model. According to the research of Lo and Lys, cash flow module is one of the special types of residual income valuation model, and there are limitations in the use of residual income model[5]. These two researchers also found that it is hard to collect all the information required to forecast future cash flows, and the hypotheses of this module might lack the realistic [5]. For example, discount rate, tax and inflation rates are assumed as constant through the period, which may not be realistic [5]. Moreover, it could be concluded from the point of Kerandi that as the main method of cash flow-based valuation, dividend valuation model is doubted in lacking accuracy in practice due to hardly estimate the share value accurately, though it is sensible in theory [6]. There are several points that support the limitation of dividend discount model. Firstly, some company may not pay dividend or do not have a clear dividend policy [6]. Even if the company has a clear dividend policy, it is unlikely that future dividends will increase at a constant annual rate in perpetuity [6]. Secondly, the model assumes rational and homogeneous investors and hope to use similar discount rate to represent whole investors [6]. Furthermore, this model did not take the macro-economic environment changes into consideration and not take account the changing required rate of return [6]. There is a paradox that negative value will be given if the discount rate is smaller than the constant rate of growth in dividends [6].

Generally speaking, research above all includes the analysis of different valuation methods by different classification, and the cash flow method and earning methods tend to be talked more. However, as Imam et al. mentioned, motivation can lead the difference business valuation choices [2]. Therefore, this research is going to use the mergers and acquisition — one of the motivations — as the classification, do the literature review analysis of the asset-based method, earning-based method and cash flow based methods, try to fill the research gap of valuation motivation subdivision. Moreover, at the same time, this study also hopes to draw a conclusion that can eliminate regional characteristics and be popularized, and provide directions for the follow-up researchers.

The remainder of this paper is organized as follows. Section 2 reviews the existing researches based on the three valuation methods separately in the case of mergers

and acquisition, and also includes our discussion. Section 3 is about the conclusion of whole paper and future indirections.

2. THE REVIEW OF THREE METHODS SEPERATELY IN THE CASE OF MERGERS AND ACQUISITION

This section reviews and discusses the previous researches in the order of asset-based method, income/earnings-based method and cash flow-based method separately.

2.1. Asset-based method used in the case of mergers and acquisition

For the asset-based method of business valuation in mergers and acquisitions, many researchers discussed a lot and got different conclusions. Some of them focused on all asset-based method evaluation, and some paid attention to the specific methods in the asset-based method, including book value method, fair value, and replacement cost. At the whole asset-based method level, Aluko and Amidu in 2005 studied the situation of the cooperate entities' valuation, trying to find how these companies were evaluated during merging and acquisition by using the asset-based methods [7]. In this research, they examined three methods and explored their benefits and limitations separately. After researching, they found that for entity enterprises, in the selection of asset-based valuation methods, the basement is the understanding and explanation of asset's value because different explanations can lead to the different asset valuation methods which are also impacted by the physical situation such as the nature of business and the requirements of trading parties [7]. Nevertheless, it is worth noticing that no matter which asset-based valuation, it cannot be solved by calculating some intangible assets such as goodwill, patents, and trademarks [7]. Similarly, Mohendroo, as the valuations in Deloitte, Mazzariol and Thomas, and Jenkins, also discussed the asset-based valuation in the process of merging and acquisition [8-10]. Although they tried to find the single and precise asset valuation method to match all situations in merges and acquisitions, they still got the conclusion as similar as Aluko and Amidu, that is in practice, the asset valuation needs to be considered based on the explanation of assets and the main needs of buyers and sellers [8-10]. Moreover, expect the intangible assets mentioned before, the impression of premium factors on the accuracy of evaluation results is also worth considering [8-10]. Unlike the above research without clear relative opinion, Kumar and Rajib and Hrimei did the quantitative research of companies' financial characteristics and valuation methods in the case of merges and acquisitions, Indian and Romania separately [11-12]. They found that net asset method, adjust net asset method and replacement cost calculation is the most

frequently used valuation method in the company with lower cash flow and debt level during the merge and acquisition [11-12].

In evaluation, the researches above all did the study and evaluated the asset-based valuations in the case of merge and acquisitions, and explored the benefits and limitations. Moreover, some studies also narrowed down the research areas in one specific region or company with specific conditions such as Nigeria and Indian. Also, researchers pointed out the existing problems and paradoxes in this area and layout their own opinions and potential solution. However, the limitations in these studies cannot be ignored as well. Firstly, most of these studies focus on the evaluation and conclusion of theories, might lack the experimental demonstration or survey to provide the empirical evidence that can support their opinions. Secondly, although some of them provide empirical evidence, the conclusion tends to lack universality because the research area they choose focuses on specific countries or political systems; thus, Angwin pointed that the difference in the external environment might impact their final results [13]. For example, different countries might have different requirements and management principles for the process of merging and acquisition. It is also worth noticing that the priority purpose of these studies with empirical evidence seems not only to focus on the study of valuation methods, especially in asset-based methods in the case of mergers and acquisitions, but also focus more on the performance and characteristics of companies they choose. Therefore, in the area of asset-based valuation methods, the precise might lack as well.

2.2. Earning/income-based method used in the case of mergers and acquisition

In respect to the earning/income-based method applied in the case of mergers and acquisition, some researchers focus on the P/E ratio to evaluate the business, they come to various conclusions about its suitable situations and limitations in the field of mergers and acquisitions. Many researchers study the financial status of companies to compare the situation before and after mergers and acquisitions, meaning that the study is descriptive in fact. Selvi studied the impact of mergers and acquisitions on companies from the perspective of P/E ratio, concentrating on it in five various aspects and nine years from 2008 to 2017 [14]. In his study, companies got together in order to create synergies, improve the efficiency of the profit, enhance competitiveness and open up new markets [14]. Nevertheless, in fact it proves that not all mergers and acquisitions have turned out well, and some have been turned out to be disastrous business combinations [14]. The results show that the financial indicators of most companies worsen markedly after mergers and acquisitions, which could be revealed from the

acquisition company's lower EPS, ROA, ROE and P/E ratio [14]. However, it sometimes will occur that giving up something in the short term can pay off in the long run [14]. While these businesses face short-term losses, they combine to reap long-term profits [14]. In this aspect, the view of Prusty, Gohil, Bansal and Tanna seems to coincide with his [15]. Similarly, they analyzed the performance of Tata before and after the acquisition and concluded that Tata obviously profited from the acquisition of Corus and would continue to benefit from Corus capital and technology in the long run [15]. On the contrary, Weston considered that P/E ratio works only in the short term [16]. Assumed that the P/E ratio will be transferred to the combined company, in the long term in real life, the lower growth of the five sellers, reflected in their lower P/E ratios, will restrain the earnings growth of the buyers [16]. On this basis, Tambi chose more samples from a database of 40 companies from CMIE's PROWESS, using the paired t-test on the average difference of four parameters including the P/E ratio as a reference to evaluate the impact of the merger on Indian companies [17]. The research turned out that the Indian companies showed no difference from companies in other regions and mergers did not take an active influence in performance [17].

To further evaluate the business situation, more factors should be considered. Almost all of the above studies are based on small base samples and the time span is not wide. As a result, they all come to different conclusions. Therefore, further improvement and research are needed to realize the prediction of both short-term and long-term impacts. Researchers must use other variables such as gross margin, financial leverage and use of return capital and dividend payout ratios to better understand financial conditions since the P/E ratio method itself is a relatively rough and flawed indicator. It could be easily concluded from the above researches that sample selection has a great influence on the results. In addition, the index of P/E ratio is also unstable, and P/E ratio is merely a reference factor for investors, which is not able to be used as an influence condition.

2.3. Cash flow-based method used in the case of mergers or acquisition

In 1994, Hurley and Johnson researched a realistic dividend valuation model [25]. Their study referred to

Williams's seminal dividend discount model: $V_0 = \frac{D_0}{r}$,

where V_0 is the estimate of value, D_0 is the first amount of dividend paid to shareholders by the company and

$$V_0 = \frac{D_0(1+g)}{r-g}$$

Gordon's model: $V_0 = \frac{D_0(1+g)}{r-g}$, where g is the growth rate of dividend per annum. And they replaced the growth rate of the Gordon model, g , with an expected

growth rate, pg terming the resulting dividend stream a

$$V_0 = \frac{D_0(1+pg)}{r-pg}$$

geometric Markov dividend stream:

[18]. And to test their model, they selected three telephone utilities to compare the calculated results using their model with the dividend history of the selected company [18]. After the sample test, they concluded that the firms with erratic dividend patterns are preferred for the additive model, while the geometric model may be more applied for more stable income stocks [18]. Moreover, it is hard to collect all the information required to forecast future cash flows [18]. In addition, Li et.al (2003) thought the formula above assumes that the discount rate, tax and inflation rates are constant through the period, which may not be realistic [19]. Craig et.al (2017) found that the premise of using the dividend valuation model is that the company to be valued must be a listed company [20]. Because only listed companies can issue shares. In this model, shareholders will receive all the dividends [20]. Therefore, the value of the share is the present value of the dividends. And DVM is suitable for minority shareholders where shareholders are mainly interested in dividend; It is suitable for companies in the maturity stage with stable cash flows. And it is suitable for valuing shares under the existing management [20]. But in the case of mergers or acquisitions, the main purpose of a company that wants to merge or acquisition is to invest and usually as a majority shareholder, so it is not, to some extent, applied to the case of mergers or acquisitions.

3. CONCLUSION

For the review of three valuation methods, we found that most of the research is about theoretical analysis and lacks empirical evidence. And the empirical evidence as a small part lacks the generalizability and the further argumentation of the subdivision valuation method. To some extent, our research fills the research gap in the business valuation in the case of merge and acquisitions. We narrow down the business valuation into three specific methods areas and can provide some suggestions for people who need to make related decisions. However, the limitation in our research cannot be ignored as well. With the deepening of research, there are more subdivision methods under each type of valuation. But we ignore this point. Moreover, as mentioned before, some studies emphasize the impact from the external environment, but our study did not include this impact as a consideration in our research, such as the cash flow method. The preconditions for the dividend valuation model are unrealistic because it ignores a lot of factors in the external environment.

Therefore, for future indirection, we recommend that researchers can try to classify at more levels on the premise of taking motivations as the classification

standard. For example, the smaller method is taken as the classification standard, and at the same time, the previous literature is divided into study areas to explore more prominent regional features. Furthermore, the conclusion of theoretical analysis or literature reviews is also encouraged the use of rigorous scientific research methods (such as data collection and field investigation) to further demonstrate and provide more powerful empirical evidence to prove or oppose the research conclusion.

REFERENCES

- [1] Matschke, M. J. , Br?sel, G. , & Matschke, X. . (2008). Fundamentals of functional business valuation. *Journal of Business Valuation & Economic Loss Analysis*, 5(1).
- [2] Imam, S. , Barker, R. , & Clubb, C. . (2008). The use of valuation models by uk investment analysts. *European Accounting Review*, 17(3), 503-535.
- [3] Coady, P. A., & Faseruk, A. (1997). Evaluation of valuation methodologies in developed and developing countries. *Journal of Financial Management & Analysis*, 10(2), 52.
- [4] French, N. (2005). The valuation of specialised property: a review of valuation methods. *Journal of Property Investment and Finance*, 22(6), 533-541.
- [5] Lo, K., & Lys, T. (2000). The Ohlson model: contribution to valuation theory, limitations, and empirical applications. *Journal of Accounting, Auditing & Finance*, 15(3), 337-367.
- [6] Kerandi, A. M. (1993). Testing the predictive ability of the dividend valuation model on ordinary shares (Doctoral dissertation, University of Nairobi.).
- [7] Aluko, B. T., & Amidu, A. R. (2005). Corporate business valuation for mergers and acquisitions. *International Journal of Strategic Property Management*, 9(3), 173-189.
- [8] Deloitte, (2017). The merits of an asset-based approach to valuing businesses. Middle East: Deloitte, pp.1-39.
- [9] Mazzariol, P., & Thomas, M. (2016). Theory and practice in M&A valuations. *Strategic Direction*.
- [10] Jenkins, D. S. (2006). The benefits of hybrid valuation models. *The CPA Journal*, 76(1), 48.
- [14] Selvi, S.(2019) Mergers and Acquisitions – a major prospect for business sustainability. *Emperor Journal of Economics and Social Science Research*, Mayas Publication Vol.1, issue.4
- [15] Prusty, R. &Gohil, P. & Bansal, A. & Tanna, J.J. (2011) Are Mergers and Acquisitions Beneficial? The Case of Tata's Corus Buy International Journal of Financial Management, Vol. 1, Issue 3, p. 63
- [16] Weston, J.F & Samuel, C.W (2002) Tata McGraw Hill Publishing Company Limited, New Delhi, Page 3
- [17] Tambi, M.K. (2005) Impact of Mergers and Amalgamation on the performance of Indian Companies. *Econ WPA Finance*,0506007
- [18] Hurley, W. J., & Johnson, L. D. (1994). A realistic dividend valuation model. *Financial Analysts Journal*, 50(4), 50-54.
- [20] Craig, A., Aaron, Burger, Nicholas, Weiland, & Sarah. (2017). Guide to the Resilience Dividend Valuation Model.