

## Mergers and Acquisitions: A Review of Valuation Methods

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### Abstract

*Globally, mergers and acquisitions (M&A) have grown dramatically in recent years. M&A offer companies the opportunity to grow rapidly and successfully. One of the most critical elements in M&A is the valuation of companies as the success of an M&A is closely related to determining the fair value of the companies. Determining the value of a company is one of the most complex and difficult subjects in financial management. Corporate executives face many choices and complications as they try to assess a company's value. There are a variety of ways to value a company. In this study I discussed the main methods of business valuation and I analyzed how to use the Discounted Cash Flow Method in M&A. This Method determines a company's current value according to its estimated future cash flows and is often used in the valuation of companies. Finally I tried to determine which method would be appropriate in an M&A.*

**Keywords:** Company valuation, Merger and Acquisition, Discounted Cash Flow Method

### 1. Introduction

In today's business climate, constantly increasing competition, shifting profit margins, and rapidly changing technology have directed businesses to M&A as a faster way of growing. M&A means the combination of two or more companies, including their assets and debts, to become a single company. As a result of mergers, current companies may lose their legal entities and create a new company, or combine with each other under the legal entity of one of the current companies. Sometimes, companies obtain a majority share of another company. This type of a merger is called "acquisition." Firstly, we should recognize that there are two parties (sometimes more) in the transaction: an acquirer (buyer or bidder) and a target firm (seller or acquired). Researchers have had a great interest for many years in why companies prefer to grow by mergers, what kind of mergers they perform, which factors of mergers affect the financial performance, and what relationship exists between merger type and performance. An examination of the historical development of mergers shows that there have been a variety of reasons, merger types, and performance statuses in different periods (Devos et al, 2012; Ghosh, 2001; Linn & Switzer, 2001; Powell & Stark, 2005; Uddin & Boateng, 2009).

No matter their motivation and type, the primary concern of the M&A is to help businesses create a larger value than the value they create on their own. The value of the combined firms must always be the sum of the values of the independent firms. A majority of the empirical studies on this subject have found that M&As have not been as successful as they were expected to be, and the main factor that had a negative effect on financial achievement was the inaccurate determination of company value (Agrawal et al, 1992; Bruner, 2002; Brotherson et al, 2014).

Valuation is one of the most complicated topics of financial theory. Determining the accurate and realistic value of companies in M&As has a major effect on the success in both negotiations and in the aftermath of the M&A (Rhodes et al, 2004). Many studies have shown that M&A offers result in failure, or the target firm is paid an amount that is higher than their realistic value due to errors in determining the accurate and fair values of companies. Naturally, this prevents the expected synergy after the M&A. Synergy is the additional value that is generated by combining two firms, creating opportunities that would not been available to these firms operating independently (Devos et al, 2012; Shleifer & Vishny, 2003; Damodaran, A. (2005)

Deciding on an amount for target companies that is higher or lower than it should be will result in the determination of an inaccurate price. For this reason, the partners of either the selling or the buying company will be dissatisfied with this situation. This study will discuss different methods that can be used to determine the values of companies, and analyze how the Discounted Cash Flow Method, a common method in company valuation, can be used in M&As.

## **2. Valuation Methods in Mergers and Acquisitions**

Initially, it is necessary to distinguish the terms “value” and “price.” Price is the amount of money paid to obtain a good or service, and it may not necessarily reflect the value of that goods or service all the time. Price varies based on supply and demand, and economic and political conditions. In other words, a price may be higher or lower than the value of the goods or service it is paid for. In M&As, similarly, there may be a significant difference between the value of a company and the price to be paid for it. The important point here is the realistic determination of the company’s value. The more accurate and realistic the valuation is, the more accurate will be the price to be paid. There are a number of methods used in business valuation, with different methods more suitable in different conditions. For instance, if a company has low profitability, yet high-value permanent assets, these assets will become more important than its profitability in the valuation process. One method will not be suitable for all M&As. This study will focus on three methods that can be used in M&As.

### **2.1. Balance-Sheet-Based Methods**

Balance-sheet-based methods attempt to identify the value of a business by examining the balance-sheet values of their assets. This is a traditional approach dictating that the value of a business is determined considering the assets owned by that business, regardless of the future. These methods ignore intangible assets like brand names, patents, technical know-how and management competence (Gabehart, S.1998; Damodaran, A. 2005). Balance-sheet-based methods comprise: book value, adjusted book value, liquidation value, and replacement-cost value.

#### **Book Value**

The book value of a business is calculated by subtracting the debts from the total value of the assets on the balance sheet. This method is not suitable in M&As as it shows the past balance sheet values of the assets, these values may be very different from the current values, and intangible assets are not included in the balance sheet. However, it is right to use this method in establishments where the difference between the balance-sheet value and the current value is small (e.g. banks), and low-profit or no-profit establishments if the market value of the establishment is smaller than its book value.

#### **Adjusted Book Value**

The adjusted book value of a business can be calculated by identifying the market values of the assets in the balance sheet, and adding the values of the intangible assets which are not included in the balance sheet. This eliminates the negativities of book value to some extent.

#### **Replacement-cost Value**

This value is calculated by considering the costs of obtaining assets that are similar in all ways to the assets in the balance sheet of the company. This method does not consider intangible assets either, which means that it is not a suitable method for M&As.

#### **Liquidation Value**

The liquidation value is calculated by subtracting the debts from the value, which is created by selling all assets of the company. It is the lowest value that an establishment has. The liquidation value does not have any meaning in M&As except for extraordinary situations as the main goal of M&As is to combine the powers of businesses and become stronger. This value would have a meaning in case of buying a business that has a financial loss.

### **2.2. Income Statement and Market-Based Methods:**

In the income statement and market-based method, the value of the company is determined considering the income statement and market data, rather than the data on the balance sheet.

## **Market Price**

The market price of company is usually calculated considering the market prices of their shares. The market price of shares is a value that varies by supply and demand conditions on the market. The market price may change in relation to economic conditions, the activeness rate of the company, and other conditions outside the company, although there is no change in the activeness of the company itself. Thus, the price of the shares in the market may be higher or lower than the real value of the company. Here are the main disadvantages of using the market price of shares in M&As:

- When a majority of the company's shares are not traded in the market, the market price does not reflect the realistic value of the company.
- Economic and political conditions may give a high or low price for the company's shares.
- The prices created on the market will not be consistent as the activeness of the markets decreases.
- When news about M&As are heard in the market, there can be abnormal changes in the market price.

## **Earnings/Price Ratio**

In M&As, the earnings/price ratio (E/P) is commonly used, particularly in the valuation of non-public companies, as it is easy to apply. The E/P for non-public companies is unknown because there is no market price for their shares. In these situations, the reference is the E/P of another company which is active in the same sector as the company to be valued, has similar characteristics, and is traded in the stock exchange. In this method, the current or future values of the establishment are multiplied by the E/P rate of the reference company, which creates the value of the establishment. If there are no companies similar to the establishment to be valued using E/P, the E/P rate of the sector can also be used, which is a more practical way as well. Whether the E/P of a similar company or the E/P of the sector is used, this approach is not suitable for M&As as it is based on the current or past values of the establishment. However, it is accepted as an applicable and practical method where there is insufficient information about the establishment, or the uncertainty about the future is high.

## **Price/Sales Ratio**

The price/sales ratio (P/S) method is similar to the E/P method. The P/S of a company similar to the establishment to be valued or the P/S of the sector is multiplied by the sales of the establishment in question. This method has disadvantages similar to the E/P method.

### **2.3. Discounted Cash Flow Method**

The fundamental valuation in M&As is the Discounted Cash Flow Method (DCF), which is based on capital budgeting theory. The discounted-cash-flow approach in an M&A setting attempts to determine the value of the company by computing the present value of cash flows over the life of the company (Schill et al. 2008; Mukherjee et al. 2004; Luerhman, 1999; Damodaran, A. 2005; Steiger, 2010; Brotherson et al. 2014). Whereas the methods previously mentioned in this study consider current or past values, DCF determines the company value according to the future performance and risks of the company. Although M&A is actually an investment decision, it is more complicated than other investments due to the fact that the risks of a typical investment are similar to the current investments of the establishment, while M&A requires considering other factors besides the assets that are being merged, including the establishments' debts, managers and other employees, customers, and corporate culture. For this reason, the decisions to perform M&A should be made after highly meticulous analyses.

In both M&As and decisions to go public, it is necessary to determine the free cash flow expected in the future, the suitable discount rate, and the period over which to make the predictions in order to use the DCF method in company valuation.

### **Determining the Free Cash Flows (FCF)**

Valuation studies in M&As should be initiated with the individual valuation of the companies to be merged, not only that of the target company. This should not be overlooked. Each company should be valued separately to see whether it is possible to create a synergy. The future free cash flows can be determined with the assistance of pro-forma income statements to be prepared for each company. The company value is estimated by discounting the FCF with the weighted average cost of capital (WACC) of the company. It is relatively easy for companies to estimate their future free cash flows without M&As by using past data. However, it is much more difficult to estimate both companies' future free cash flows after the M&A.

At this point, it is critical to make an accurate identification of the synergy to be created by the M&A. Mostly, the company value is not calculated accurately due to the fact that the synergy expected from the M&A is unrealistic. A survey of KPMG (1999) shows that ex-ante/pre M&A synergy evaluation is the most important factor behind a successful M&A; it increases the probability of success by 28% according to respondents. It is possible to create synergy in a variety of ways. The synergy resulting from the increase in the effectiveness of activities after the M&A is called the “operating synergy.” When establishments merge their activities, they can obtain operating synergy by increasing their sales and reducing their fixed costs, such as marketing expenses, research and development expenses, and management expenses. The operating synergy is a result of economies of scale. It is even more important for capital-intensive sectors, which include high levels of fixed costs (Gaugan, 1999; Damodaran, 2005). “Financial synergy” consists of the financial advantages provided by the M&A. This synergy is created by the increase in the debt capacity of the establishment, tax savings, and most importantly, the reduction in costs of credit, which is an aspect of being a large-scale company. This synergy is likely to show up most often when large firms acquire smaller firms, or when publicly traded firms acquire private businesses. (Damodaran, DePamphilis, 2001).

Let us assume that Company A and Company B wish to perform a merger, and together become Company AB. This merger needs to create an additional value in order to be rational. This point can be expressed as follows:

Synergy = The Value of Company AB – (The Pre-merger Value of Company A + The Pre-merger Value of Company B) When the earnings provided by the synergy are greater than the spendings made for the merger and the amount paid to the target company, this situation creates an additional value. The value of the combined firms will always be the sum of the values of the independent firms. The period of time to be estimated is as important as the accurate determination of synergy. The estimation period should be short, especially when uncertainty is strong. For instance, if the cash flows after the merger can be estimated reasonably for the following five or six years, it is acceptable to make certain simplifying assumptions for the years after that period. After the period that is estimated reasonably, it is possible to make further assumptions including the cash flows staying the same, or growing in consistency with the growth rate of the sector. It is necessary to apply some effort to estimate the cash flows in different scenarios to increase the consistency of estimations.

Following is the calculation of the FCFs to be obtained after the M&A:

$$FCF = \text{NOPAT} + \text{Depreciation and Noncash Charges} - \text{CAPEX} - \Delta\text{NWC}$$

where;

*NOPAT* is equal to *EBIT* (1-*t*)

*CAPEX* is capital expenditures for fixed assets.

*ΔNWC* is the increase in net working capital defined as current assets less the non-interest bearing current liabilities.

*t* is the appropriate marginal tax rate

*Deciding on the Discount Rate*

After the identification of the FCFs following the M&A, with the assistance of the pro-forma statements expressing the expected operating and financial synergies, it is necessary to determine the discount rate to be used for discounting these cash flows. Weighted average cost of capital (WACC) is the discount rate that is commonly used in M&As. In M&As, however, the WACC should be calculated for the company that is created by the merger, instead of the WACC of the buyer or the target company. This is due to the fact that there will be a different capital cost after the merger related to the operating and financial synergy. The determination of the WACC has a variety of challenges, including whether the company is public or non-public, the majority of the shares being traded in the market, and the development rate of the capital markets. The more developed the capital markets, and the more shares being traded in the market, the easier it will be to calculate the WACC.

$$\text{WACC} = W_d k_d(1-t) + W_e k_e$$

Where;

- $k_d$  is the cost of debt
- $k_e$  is the cost of equity capital.
- $W_d$ ,  $W_e$  are target percentages of debt and equity
- $t$  is the marginal tax rate.

The costs of debt and equity capital in the equation should be based on the desired capital structure after the merger. The costs of debt and equity capital after the merger may be different from the costs before, and it should also be noted that the tax rate may change as well. After the determination of the FCFs and the WACC after the merger, the discounted value of these cash flows is calculated. As stated above, this value is supposed to be greater than the total of the discounted values of the individual companies. If this value is not greater than the total values of individual companies, the merger will not make any sense in economic terms. The merger being economically unreasonable does not mean that it will not be realized. Managers may wish to administer larger establishments. Thus, M&As may be performed as a result of such psychological reasons as well.

### **Conclusion**

Valuation is one of the most important factors in the success and the maintenance of the success of M&As. This study has examined a variety of valuation methods and focused on their disadvantages and advantages. The main focus of the study was the DCF method that determines the value of an establishment considering its future performance, rather than the current and past performances, and which helps find a more accurate and realistic value than the other methods. The accurate calculation of the synergy to be obtained from the M&A plays a key role in the determination of the accurate value. There have been many cases where mergers result in failure as the highly optimistic expectations are not realized at the end of the merger.

However, pessimism about the synergy to be created by the merger is a barrier to a potentially successful merger. If the synergy of the merger is determined using different scenarios (e.g. optimistic, pessimistic, the most likely), this will reduce estimation errors. The researcher suggests that individuals should use multiple methods to decide on company value, and give a weight to each method considering the conditions of the company, country, and market.

### **References**

- Agrawal, Anup & Jeffrey Jaffe & Gershon Mandelker(1992). The post-merger performance of acquiring firms: A re-examination of an anomaly. *Journal of Finance*, 47(4), 1605-2147.
- Bruner, R. F. (2002). Does M&A pay? A survey of evidence from the decision-maker. *Journal of Applied Finance*, 12 (1), 48-68.
- Brotherson, W. Todd & Eades, Kenneth M. & Harris, Robert S. & Higgins, Robert C.(2014).Company Valuation in Mergers and Acquisitions: How Is Discounted Cash Flow Applied by Leading Practitioners?. *Journal of Applied Finance*, 24(2).
- Damodaran, A. (2005). The Value of Synergy. Stern School of Business.  
<http://people.stern.nyu.edu/adamodar/pdfiles/papers/synergy.pdf>
- Devos, Eric & Palani-Rajan Kadapakkam & Srinivasan Krishnamurthy(2012). How Do Mergers Create Value?A Comparison of Taxes, Market Power, and Efficiency Improvements as Explanations for Synergies. June 15, <http://rfs.oxfordjournals.org/>
- Gabehart, S.(1998). Guide to buying, Valuing and Selling Your Business, Dearborn Financial Publishing, Inc.,Chicago,s.191.
- Ghosh, Alope(2001). Does operating performance really improve following corporate acquisitions?. *Journal of Corporate Finance*,7(2).
- KPMG, 1999, "Unlocking Shareholder Value: The Key to Success. Mergers & Acquisitions: A Global Research Report".
- Linn, S.& J.Switzer (2001). Are cash acquisitions associated with better post combination operating performance than stock acquisitions?.*Journal of Banking and Finance*, 25(6).
- Mukherjee, T. & K.H.Kiyamaz & H. K. Baker (2004). Merger motives and target valuation: A survey of evidence from CFOs. *Journal of Applied Finance*, 14(2).
- Shleifer, Andrei & R. Vishny(2003). Stock market driven acquisitions. *Journal of Financial Economics*, 70(3).
- Schill, Michael J. & Chaplinsky, Susan & Doherty, Paul (2000). Methods of Valuation for Mergers & Acquisitions. Darden Case No. UVA-F-1274. SSRN: <https://ssrn.com/abstract=909677>
- Rhodes-Kropf, Matthew & David T. Robinson & S. Viswanathan (2005). Valuation waves and merger activity:The empirical evidence, *Journal of Financial Economics*,77( 3).
- Powell Ronan G. & Andrew W. Stark (2005). Does operating performance increase post-takeover for UK takeovers? A comparison of performance measures and benchmarks. *Journal of Corporate Finance*, 11(1-2), 293-317.
- Uddin, Moshfique & Agyenim Boateng (2009), An Analysis of Short-Run Performance of Cross-Border Mergers and Acquisitions: Evidence from the UK Acquiring Firms, *Review of Accounting and Finance*, 8(4).  
<http://dx.doi.org/10.1108/14757700911006967>