Methods for Valuation of a Target Company at the M&A Market

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Abstract: Mergers and acquisitions are a used and respected alternative to a company’s organic growth and they are a significant channel of capital redistribution. The actual process of company combinations is performed in more possible forms and it is affected by a number of factors of local, regional, national and global character, which may not lead to a successful end. It is an investment that does not occur in a company’s life very often. The process can be divided into three stages: preparation and plan; implementation; and integration. The key factor of the first stage is the establishment of the value of the target company as a basis for successful negotiations. The implementation stage is a stage of analyses. At the third stage the acquiring business manages the demanded changes in the acquired business. The aims of this paper are to analyse valuation methods and outline the procedure for using the discounted cash flow method adapted to the conditions of the Czech M&A market. Especially risk factors and their reflection in the valuation method are considered.

Key-Words: mergers and acquisitions, planning, implementation, integration, due diligence, target firm, methods of valuation, discounted cash flow method

1 Introduction
The transformations of enterprises are more broadly referred to as business combinations. They are strategic decisions in the life of a business affected by a larger number of factors of local, regional, national and even global character. A business combination according to US accounting principles¹ is defined as a transaction through which an entity obtains control of a business. According to Czech regulations, a group of businesses is formed when an entity obtains a substantial influence, i.e. when a business owns 20 and more percent of voting rights of another business. A business combination should bring an increase in the value for owners thanks to two basic approaches referred to as asset exploiting and asset augmenting. It involves not only capital transactions but also transformation processes which include complex sets of assets and liabilities of the participating businesses.

The Czech trade law [21] defines a merger as a combination in which one or more companies cease to exist without liquidation and their equity, including rights and duties following from labour-law relations, are transferred to another existing or a newly established successor company. It means this is a legal combination which requires an agreement of all participating companies. On the other hand, an acquisition is a transaction in which one company (the bidder) gains a decisive share of the basic equity of another (target) business. The acquisition can have a character of a capital investment (capital acquisition) or a property acquisition, in which the entire company or its part is purchased. By this a group of companies connected by their capital arises and the legal position of individual companies does not change [2]. Unless this is a hostile takeover, also a legal takeover can take place in case of property acquisition or capital acquisition by one owner [4]. The differences between mergers and acquisition will mainly stand out in accounting procedures [1]. Similarly, the European law (Directive 2005/56/EC of the European Parliament and of the Council of 26 October 2005 on cross-border mergers of limited liability companies) defines a merger as a process in which one or more companies, on being dissolved without liquidation, transfer all their assets and liabilities to another existing or a new company, in exchange for the issue of securities or shares representing the capital of the successor company.

¹ ASC 805 - Business Combinations in U.S. generally accepted accounting principles (US GAAP).
and, if applicable, a cash payment not exceeding 10% of the nominal value of those securities or shares.

2 Problem Formulation

As follows from the definitions of acquisitions and mergers, also the difficulty of negotiations and the combination process itself will depend on the type of M&A and the conditions of the external and internal environment [6]. The perception of M&A risks will be different in a company which wants to gain an ownership interest or the entire business (acquirer, bidder) and different in a company which is to be acquired (target). The entire process is usually facilitated by a consulting agency (auditing, legal, taxation, investment, accounting, financial agency, etc.) and is divided into three fundamental phases: planning, implementation and integration [16]. The M&A process is illustrated in Fig. 1.

Figure 1: The diagram of M&A process fundamental phases

<table>
<thead>
<tr>
<th>Planning: ≈ 6 months</th>
<th>Implementation: ≈ 6 months</th>
<th>Integration: ≈ 3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation of the strategy, analysis of potential targets, selection of a partner, negotiations.</td>
<td>Preliminary agreement, due diligence, evaluation of the company, negotiation, closure of the contract.</td>
<td>Integration project, team creation, identification of competences, implementation of changes to ensure growth and increase in the value for shareholders.</td>
</tr>
</tbody>
</table>

→ LOI → SPA Announcement ← End

Source: author

The aim of the planning phase is to choose the target firm. Strategic objectives and mainly the outcomes expected from the prepared merger or acquisition are defined. The plan should answer the questions whether, when and how the expected outcomes will be achieved. The phase ends with an agreement on a future agreement (LOI). From an accounting and reporting point of view, we could consider the moment of LOI to be the effective day of the business combination as of which the successor company creates the starting balance sheet based on final financial statements of participating businesses created as of the preceding day [15]. From the accounting point of view, negotiations of the companies being dissolved without liquidation are considered negotiations at the expense of the successor company since this moment. The effective day of merger cannot precede the day on which an application for merger to be registered in the trade register will be submitted by more than 12 months [19].

The implementation phase can be described as a phase of analyses which are to identify weaknesses of acquired businesses and risks related to their acquisition [12]. The performance of the analyses is usually entrusted to professional agencies who investigate all activities of businesses acquired within M&A, especially in the areas of trade, finances, law, taxation, technology, science and research, environment, human resources and organizational culture. This eliminates an information asymmetry between the acquirer (the purchasing entity) and the acquiree (the selling entity). In the USA, this investigation is referred to as due diligence\(^2\), which means a purposeful, thorough and professional analysis and investigation of an intended trade opportunity and risks during negotiations on purchase and sale. Due diligence is sometimes compared to an early warning system against an unfavourable trading transaction. At the end of the implementation phase, the negotiations on the transaction conditions have been concluded reflecting its real values as precisely as possible (at this stage, the acquirer has relatively complete information about the transaction, the evaluation of partial activities and preliminary projections). Therefore, the final offer can be made by the bidder and the share purchase agreement (SPA) can be prepared.

At the third stage (post merger integration – PMI) the acquiring business manages the demanded changes in the acquired business. The actual merger of two or more organizational units into one occurs. This process is the vital phase as the M&A objectives are implemented. The key document is the integration project which is based on the results of the implementation phase and is usually controlled by a member of the TOP management and a board consisting of managers of participating companies. By concluding the PMI the transformation process of the business is finished and the business is ready for gradual meeting of the

\(^2\) The meaning of due diligence is defined as "acting with due care and reason". Nowadays the term is used for several concepts, one of them being an investigation of a business or person prior to signing a contract, or concerning M&A, an investigation the acquirer conducts before a purchase or acquisition of the target firm.
underestimation of risks occurring during the three mentioned phases of the transformation process. One of the risks appearing at the very beginning of decisions on a merger or acquisition is an incorrect valuation of the companies entering the transaction and its further precision within the due diligence process [18]. The starting point is the target company, whose market value is established using a suitable valuation model, independent from the prepared merger. The procedure of the valuation of merging entities and the establishment of the purchase price is illustrated in fig. 2.

Figure 2: Process of enterprise valuation and selling price calculation

<table>
<thead>
<tr>
<th>Public domain information</th>
<th>Specific market and competitor analysis</th>
<th>Selling price of the seller</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal analysis</strong></td>
<td></td>
<td>Greed and fear</td>
</tr>
<tr>
<td>Net asset method</td>
<td>Capitalised earnings</td>
<td>Discounted CF method</td>
</tr>
<tr>
<td>Standalone value</td>
<td>+ Synergies</td>
<td>- Cost of transaction</td>
</tr>
<tr>
<td></td>
<td>= Purchase price of the purchaser</td>
<td></td>
</tr>
<tr>
<td>Public market analysis</td>
<td></td>
<td>Merger market analysis</td>
</tr>
</tbody>
</table>

Source: Picot 2002

3 Problem Solution

To establish the market value of a target firm, three methods are proposed in the diagram in fig. 2 (net asset value, capitalised earnings method, discounted cash flow method). When using the discounted cash flow (DCF) method, which is described by equation (1) is necessary to define all components of risk that significantly affect the market value of the target company [3]. Role here also plays a premium that acquirers are willing to give the owners of the target company. The components of risk are reflected in the discount rate, which represents weighted average cost of capital (WACC).

\[
V_T = \sum_{t=1}^{n} \frac{FCFF_t}{(1+WACC)^t}
\]

\[
WACC = \frac{r_E}{E+D} + \frac{r_D}{E+D}
\]

where:

- \(V_T\) - Value of target firm
- \(FCFF\) - Free cash flow to firm
- \(WACC\) - Weighted average cost of capital
- \(t\) - Number of years (1 to n)
- \(E\) - Equity
- \(D\) - Debt

\(r_E\) - Cost of equity
\(r_D\) - Weighted arithmetic average of the interest rate paid on borrowed capital

The return rate demanded by investors \(r_E\) will be established using CAMP\(^3\) model, which shows the relationship between the expected risk rate and the expected return. The investor takes risks with each investment – the risks have to be compensated for by an adequate return.

\[
r_E = r_f + \beta \cdot r_b + r_{se} + r_{cm} + r_L + r_{sr}
\]

\[
r_b = r_m - r_f
\]

where:

- \(r_f\) - Risk-free rate of return
- \(\beta\) - Deviations of systematic risk from the risk premium of the capital market
- \(r_b\) - Basic risk surcharge (return premium for the risk of investing in shares)
- \(r_m\) - The expected rate of return of the capital market
- \(r_{se}\) - Risk surcharge for small enterprises
- \(r_{cm}\) - Surcharge for market capitalization
- \(r_L\) - Share liquidity risk

\(^3\) Capital Assets Pricing Model
Surcharge for other specific risks

The risk-free rate of return (r_f) is established at the level of the interest rate of state bonds, e.g. according to Czech National Bank statistics, the return of ten-year bond in 2010 was (Maastricht criterion) 3.89%.

If data from a capital market is available, we can estimate the regression coefficient \( \beta \) based on an analysis of the temporal series of return rate of shares of the valuated business (r_i) and the return rate of the market (stock index) using equation

\[
\beta = \frac{\text{cov}(r_i, r_m)}{\sigma (r_m)} \quad (5)
\]

If data from a working public capital market is unavailable, we can use a simple model based on a set of selected factors which is based on the level of systematic trade (business) and financial risk. For example factors used in the methodology by Maříková and Mařík [11] assessed in tab. 1.

Table 1: Example of factors for \( \beta \) coefficient estimate

<table>
<thead>
<tr>
<th>Scale for risk rate evaluation</th>
<th>0.5</th>
<th>1</th>
<th>1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity to changes of the economic cycle</td>
<td>minimum</td>
<td>develops with the cycle</td>
<td>high</td>
</tr>
<tr>
<td>Negotiation power with suppliers</td>
<td>more on the side of the business</td>
<td>balanced</td>
<td>more on the side of the suppliers</td>
</tr>
<tr>
<td>Negotiation power with customers</td>
<td>more on the side of the business</td>
<td>balanced</td>
<td>more on the side of the customers</td>
</tr>
<tr>
<td>Proportion of fixed expenses in total expenses</td>
<td>low</td>
<td>average</td>
<td>high</td>
</tr>
<tr>
<td>Debt rate (D/E)</td>
<td>lower 40%</td>
<td>40–80%</td>
<td>higher 80%</td>
</tr>
<tr>
<td>Size of the business</td>
<td>large</td>
<td>medium</td>
<td>small</td>
</tr>
<tr>
<td>Territorial diversification</td>
<td>considerable</td>
<td>medium</td>
<td>small</td>
</tr>
<tr>
<td>Product diversification</td>
<td>considerable</td>
<td>medium</td>
<td>small</td>
</tr>
</tbody>
</table>

Source: Maříková a Mařík, 2001

\( \beta \) estimate will then be the weighted arithmetic average:

- Risk level | Frequency | Conversion
- 0.5 | 1 | 0.5
- 1.0 | 2 | 2.0
- 1.5 | 5 | 7.5
- In total | 8 | 10.0
- Coefficient \( \beta = 10/8 = 1.25 \)

The expected rate of return of the capital market (r_m) will be established as a sum of the premium for developed stock markets (r_pUSA) and the premium of the country (r_pE). The USA has been chosen as an example of a developed market and the premium is calculated as a difference of the rate of return of stocks and bonds during the past 5 years, e.g. \( r_{pEUSA} = 4.8\% \) risk-free rate \( r_{USA} = 3.9\% \). The country risk can be derived from the Inward FDI Potential Index, which allows us to establish the attractiveness of a specific country based on selected economic factors [17], or CASS MARC M&A Maturity Index [5], which comprises six partial factors of risk. Table 2 shows the values of the index for the Canada and USA (mature markets), Czech Republic and Poland (transitional markets), Ukraine (emerging markets).

Tab. 2: CASS MARC M&A Maturity Index

<table>
<thead>
<tr>
<th>Country</th>
<th>Factors</th>
<th>Index (r_pE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>regulatory</td>
<td>economic</td>
</tr>
<tr>
<td>Canada</td>
<td>1.8</td>
<td>1.7</td>
</tr>
<tr>
<td>USA</td>
<td>1.5</td>
<td>1.9</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>2.8</td>
<td>2.1</td>
</tr>
<tr>
<td>Poland</td>
<td>3.3</td>
<td>2.3</td>
</tr>
<tr>
<td>Ukraine</td>
<td>3.8</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Source: CASS 2011

The estimate of the risk premium of a country will change in dependence on the country rating and the effect of the country risk on the risk of the business. The coefficient of the country risk effect on the business risk (\( \lambda \)) will be evaluated according to the conditions of the external environment within the range of 0 to 1. For example, we will choose \( \lambda = 0.6 \) therefore \( r_{pECR} = 0.6 \cdot 2.1 = 1.26\% \).
The surcharge for the size of the business $r_{se}$ is estimated according to INFA model \cite{INFA} in dependence on the value of payable resources (owned capital, bank loans and bonds) at an amount of 1.1%.

The value of the risk surcharge for market capitalization is determined by the ratio of the book value and the market value of the target firm. It is established based on the values achieved in the field of activity of the business. In our example, we will use the results of the economic situation analysis of industrial enterprises in the Czech Republic in 2010: $r_{fc} = 0.5\%$.

The stock liquidity risk of a specific business is derived from activities in the market; in our case, we choose the value of $r_L = 0.8\%$ in compliance with the INFA methodology. The surcharge for other specific risks ($r_{sr}$) is derived from deviations from means of qualitative and quantitative aspects of performance in the field of activity. In the Czech conditions, the specific risk in 2010 ranged between 2.04 and 3.59%. For our example, we will use $r_{sr} = 2.76\%$. When equation (3) is used, the rate of return demanded by investors in business stocks is

$$r_E = 3.89 + 1.25 \times (4.8 - 3.9 + 1.26) + 1.1 + 0.5 + 0.8 + 2.76 = 11.75\%$$

The DCF model of the entity demands that expenditures for depths ($r_D$) are considered, established as a weighted arithmetic average of the existing interest rates paid by the business from the loaned capital. When the weights expressing the ratio between the owned and the depth were established and equation (2) was used, we achieved the value of the total risk (WACC), and used this in equation (1) to calculate the value of the target firm $V_F$.

According to Figure 2 should be included in the value of the business the synergic effect and costs associated with the merger, which can be written mathematically as:

$$S = PV_{AB} - (PV_A + PV_B)$$

(6)

Expense for a merger is calculated as:

$$C = PP_B - PV_B$$

(7)

The net current value for owners of the successor company is then:

$$NPV = S - C = PV_{AB} - (PV_A + PV_B) - (PP_B - PV_B) = PV_{AB} - PP_B - PV_A$$

(8)

where:

$S$ - Synergy

$PV_{AB}$ - The current value of the business after combination

$PV_A$ - The current value of business A as an independent unit

$PV_B$ - The current value of business B as an independent unit

$C$ - Merger expenses

$PP_B$ - The purchase price paid for business B

NPV - The net present value following from the merger for owners of the successor company

The synergic effect will be created by acquirers if they use a comparative advantage other businesses do not have and the management of the target firm itself is not able to use. The synergy from the combination will be usually manifested in the future by achieving higher returns, margins, better use of resources, lower expenses, etc. Moreover, the NPV has to reflect all risks which could threaten the economic gain for owners of the successor company or even turn it to a loss. The risk that the bidder will pay an amount to the target firm owners which will be higher than the market capitalization is mainly determined by motivation factors. Its elimination is up to the future negotiations within due diligence.

Expenses can include premium payable by the bidder to the target firm owners over its value as an independent entity. It is a part of synergy which is shifted to the target firm.

$$NPV > 0, \text{ or } S > C = PP_B - PV_B$$

(9)

If the merger is successful, shareholders of the target firm will share in the success. Shareholders of the bidding firm usually retain the same (NPV = 0), whereas the shareholders of the target firm may gain outstanding incomes. From an economic point of view, a typical merger is a net gain for investors but the competitive bidding fight together with an active protection of the target firm management, often shift a larger part of the gain to the selling shareholders’ side \cite{INFA2, INFA3}.

4 Conclusion

The formation of the final M&A price is a complex matter; the final price will be affected by a high number of quantifiable and non-quantifiable risks. The diagram in fig. 2 shows that the basis for the final price formation is the valuation of the target firm itself. However, there is no clearly set price \cite{INFA1} as it is different for each bidder, depending on what the acquirer intends to do with the target firm, what the acquirer’s financial situation is, whether the acquirer can invest some more capital in the target firm and thus achieve growth, or if some form of synergy will take place in the combined entity. Last but not least, the acquisition price also depends on risks of the merger or acquisition process. An acquirer should implement a merger if the expected
net current value for owners of the combined entity will be positive or if the expected value of synergies exceeds the expenses. A significant role in the decision making process is played by the DCF model, which is able to express the value of the target company objectively and can take account of the expected economic effects as well as risks.

5 Acknowledgements
The paper contains first results of project of Grant Agency CR no. 403/11/0447 “The Analysis of Taxation and Accounting Procedures during Mergers”. The project solution, which will be conducted in 2011–2013, was entrusted to the team of the Department of Finance, Faculty of Economics and Administration, Masaryk University in Brno.

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