

ASSESSMENT OF THE DCF METHOD IN COMPANY VALUATION

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Abstract:

This paper deals with the yield valuation method of a company based on discounted cash flows (DCF). The aim of this paper is to evaluate its suitability in practice and expose its weak and strong points. For this purpose, financial plans for over 5 years were collected from 40 companies which meet the criteria of a small accounting entity according to the categorisation of accounting units. On the basis of the collected data, the value of equity was calculated using the DCF method. These values were subsequently compared with the original value of equity. Statistical tests verified if the differences between the book value of equity and the value of equity calculated by the DCF method are statistically significant. Further tests were applied to determine whether the DCF method gives lower or higher value of equity than its book value.

Introduction

In practice, the value of companies is most frequently calculated before the planned acquisitions. A continuous assessment of a company is meaningful independently of an intended sale of the company, for it provides the owners with the information about the appreciation of their invested capital. The moment a future stagnation or even decline in equity is calculated, it is necessary to promptly consider other alternatives, such as restructuring or the sale of the company. One of the methods of calculating the expected business value is Discounted Cash Flow (DCF) method. This method is based on long-term financial plans from which discounted cash flows are calculated.

The aim of this article is to assess the suitability of the DCF valuation method on the basis of the conducted research.

The value of company is the most likely price on which the seller and the buyer would agree, in theory, in a real time. (Hrdý and Strouhal, 2010)

1. Business valuation methods

Based on research (Grünwald, 2004; Hrdý and Krechovská, 2013; Hrdý and Strouhal, 2010; Kislingerová, 2001; Krabec, 2009; Mařík, 2011), 3 basic groups of methods were distinguished.

The first group is the market valuation of the company value, which determines whether the company creates the so-called 'shareholder value'. One of the indicators is Market Value Added (MVA), which is calculated as a difference between the market value and invested capital, i.e. the difference between the sum which the shareholders and other investors would gain from the sale of their shares, and the sum which they have invested into the company.

It can be inferred that these groups of methods are suitable only for joint-stock companies with publicly traded shares, with a known current stock price.

The second group is the methods based exclusively on the current book values. An example of such method is the so-called 'substance valuation method'.

The substance valuation method determines the business value based on reproduction cost of all business assets modified by the depreciation adequate to the age of the company. (Kislingerová, 2001)

However, continuous measurement of the company's value by this method is very complicated for it requires the existence of an actual buyer who is willing to overpay the actual value of net assets so that goodwill can be manifested.

As said above, the valuation of a company should be carried out on a continuous basis for it serves as an important early warning mechanism. The Discounted Cash Flow (DCF) method allows the estimation of business value at any point based on a long-term financial plan.

Discounted Cash Flow (DCF) is a method based on the general economic theory saying that the value of the economic asset equals the current value of future revenues. (Hrdý and Strouhal, 2010)

This method is prevalent not only in the Western European countries but also in the Czech Republic. (Synek, 2002)

Even the International Financial Reporting Standards (IFRS), specifically the standard IAS 36 (Šrámková, 2015), admits to valuing a company, its parts, a cash-generating unit or a single asset on the basis of discounted cash flows. The standard concerns one of the two methods of calculating the so-called recoverable amount.

The DCF method has two stages. The first stage includes years for which a financial plan can be drawn up. (Hrdý and Strouhal, 2010)

This stage is also described as solid, proper, fair. (Synek, 2002)

In this stage, Free Cash Flows (FCF) are calculated using the financial plans in the following way: (Hrdý and Strouhal, 2010)

$$FCF = EBIT (1 - t) + \text{depreciations} + \text{modifications in working capital} - \text{investement} \quad (1)$$

where: EBIT are the earnings before and interest and tax, I is the interest expense, t is the tax rate.

$$FCF = KPVH \text{ after tax} + \text{depreciation and other non - expenditure costs} - DM \text{ growth} - \check{C}PK \text{ growth} \quad (2)$$

where: KPVH after tax is the corrected operating income, DM growth is the annual growth of fixed assets, ČPK growth is the annual growth of net working capital. (Hrdý and Strouhal, 2010)

The second stage of the calculation comprises the so-called 'terminal value' (PH) which can be calculated using the Gordon growth model or the Parametric formula.

After the calculations of the first and the second stages, a calculation of the business value is carried out (or the value of equity) in the following manner: (Hrdý and Strouhal, 2010):

$$VK = SH_1 + SH_2 - CK + NM \quad (3)$$

where: SH1 is the current value of the 1st stage, SH2 is the current value of the 2nd stage, CK is interest-bearing loan capital on the measurement date, NM are the non-operating assets on the measurement date. The current values of the 1st and the 2nd stages are calculated as discounted current values of future cash flows using the following model (Hrdý and Strouhal, 2010):

$$SH_1 = \frac{FCF_1}{(1+i)} + \frac{FCF_2}{(1+i)^2} + \frac{FCF_3}{(1+i)^3} + \frac{FCF_4}{(1+i)^4} + \frac{FCF_5}{(1+i)^5} \quad (4)$$

where: SH1 is the current value of the 1st stage, FCF are free cash flows in the individual years of the 1st stage, i is the discount interest rate.

$$SH_2 = \frac{PH}{(1+i)^5} \quad (5)$$

2. Methods

The aim of this paper is to assess the suitability of the above-explained DCF method. For this purpose, a questionnaire was distributed in 38 companies which meet the criteria of a small accounting entity according to the categorisation of accounting units (Czech accounting legislation for entrepreneurs). A small accounting unit is a status of every legal entity which meets 2 out of 3 following criteria: total assets do not exceed CZK 100,000,000; net revenues do not exceed CZK 200,000,000 and the number of employees does not exceed 50.

The value of such companies was calculated using the DCF method. As the method requires a five-year financial plan in the form of the balance sheet and the economic outturn account, the financial plan had to be, in many cases, created first. The process of creation of the financial plan was based on the recent financial statements which comprised the elements such as the expected growth in revenues (net income) and new investments. The data then allowed the simulation of the items on the balance sheet and the economic outturn account.

The hypothesis claiming that the value of equity and the value of company calculated using the DCF method are identical was tested using two statistical (non-parametric) tests; the paired-samples sign test and Wilcoxon's signed-rank test.

3. Research results

3.1. The paired-samples sign test

35 companies (see Tab. 1) were tested at the 95% probability level because, as it was found (see below), the method is not suitable for 3 companies. The sum of positive differences (value according to DCF – the value of equity) was calculated to be 26. The critical value for $n=35$ is $c_1 = 12$, $c_2 = 24$ (Kubanová and Linda, 2007). The value of the test criterion fell outside the range of acceptable values. The hypothesis that the value of equity and the value of the company calculated using the DCF method are identical was not confirmed. The value of the company calculated using the DCF method is higher than the value of equity.

TAB. 1: The sign test

Paired variables	The sign test (Table 1) The highlighted tests are significant at $p < ,05$			
	The number of different	percentage $v < V$	Z	p-value
DCF & Equity	35	22,85714	3,042555	0,002346
Equity & DCF	35	77,14286	3,042555	0,002346

Source: (own processing, SW Statistica)

3.2. Wilcoxon's test

At the 95% probability level (see Tab. 2), the critical values for $n = 35$, $w_{\alpha, n} = 195$ (Kubanová and Linda, 2007). Because $s = \min \{s^+, s^-\} = 39$, the test has also proven that the value of equity and the value of company according to the DCF method are different.

TAB. 2: Wilcoxon's test

Paired variables	The Wilcoxon's test (Table 1) The highlighted tests are significant at $p < ,05$			
DCF & Equity	35	169,0000	2,391355	0,016787
Equity & DCF	35	169,0000	2,391355	0,016787

Source: (own processing, SW Statistica)

The evaluation of this method revealed that the companies depending on subsidies, for example, have high 'other operating profit' which does not play any role in the DCF method, because this method acknowledges revenues only. The method is, therefore, unsuitable for these types of companies and 3 companies with high other operating profit compared to revenues were excluded from the research.

On the other hand, the advantage of this method consists in its ability to simulate the development of value of a company with a high initial debt. It was found that even a company which currently shows profit may in the following years go into decline which will have a negative impact on its value.

The feedback on the expert report was of interest as well. A thriving company with the current value of equity of 19 351 thousand CZK was assessed by experts to be worth 40 million CZK 5 years ago. Its value today is 60 419 thousand CZK by DCF.

Conclusion

The aim of this paper is to assess the suitability of the DCF valuation method on the basis of the conducted research.

It can be inferred from the conducted statistical tests that the value of equity and the value of the company calculated using the DCF method are not statistically the same. The value of company (by DCF) is higher than the value of equity. This is in line with the fact that most of companies create goodwill, whose value is the difference between the DCF value and the value of equity. The method is therefore suitable for determining the goodwill.

At the same time, it was found that companies relying on (for example) subsidies, that is, companies with high other operating profit, are not suitable for this method because the other operating profit plays no role in the method (it only acknowledges revenues).

On the other hand, another advantage of this method consists in its ability to simulate the development of value of a company with a high initial debt. It was found that even a company which currently shows profit may in the following years go into decline which will have a negative impact on its value.

In one case, a company was found that was assessed by an expert 5 years ago and it was, therefore, possible to compare the current value of equity, the DCF value of company and the value according to the expert report.

A continuous assessment of a company is meaningful independently of an intended sale of the company, for it provides the owners with the information about the appreciation of their invested capital.

The moment a future stagnation or even decline in equity is calculated, it is necessary to promptly consider other alternatives, such as restructuring or the sale of the company.

From the above said it can be concluded that the DCF method, whose main advantage is the fact that it includes the time factor, is suitable (taking into account its limitations for the purpose of calculating the value of the company) and it even provides additional information.

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