COMPANY EVALUATION USING THE DISCOUNTED NET CASH FLOW METHOD

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Abstract:
This paper treats one of the most important methods of evaluation of company, namely discounted cash flow method. So, after short theoretical considerations about this method we presented a practical study of valuation for a leasing firm.

Key words: discounted cash flow method; company evaluation

1. Introduction
This method is appreciated as being the most modern and complex one. In the Anglo-Saxon formulation, this method is known as discounted cash-flow (DCF), and in the French formulation is used the expression discounting method of future cash flow.

Concerning the cash-flow, there are several definitions of this notion, depending on the coverage sphere. In special papers there are met expressions like: cash flow, financial flow, flow of net liquid assets, treasury flow, liquidities flow etc.

As in the economic theory, by the term “cash” it is understood only the “actual currency”, namely the bank notes and divisional currency, we consider that this expression is not quite correct, as in the structure of money supply besides the actual currency there is also the money of account (deposits in current accounts), time deposits and other assets with a higher or smaller rank of liquidity. Consequently, the terms of liquidities flow and treasury flow seem to be the most appropriate ones.

2. Theoretical and methodological background
The theoretical, methodological base and of mathematic calculation of company values using this method, is, basically, the theory and practice for the determination of investment economic efficiency, and, particularly, the economic-financial calculations afferent to the estimation of feasibility for a investment project.

Virtually, it is taken into account the forecasting of cash flows during the exploitation and at the end of exploitation (determination of terminal value).

Actually, the company evaluation using the discounted cash flow method comes back to the direct application of the discounted value method (VAN) to select the investments projects. The method is used both by the buyer, and by the company seller having a positive VAN, in order to establish the price offer. So, the buyer uses to determine the maximal purchase price he is ready to pay and, analogously, the seller can use it to determine the company value to the minimal price he is willing to accept.

An important role, in VAN criterion, is played by the cash flow forecasting period.

From the evaluation point of view, the company life can be divided in two distinct periods:

- Explicitly forecasting period, where the cash flow can be calculated with credibility for each year. The number of years for this period is established by the evaluator, taking into account: the life period remained for the basic plant assets; the products cycle for their economic life; credibility of forecasting; period of time when the business (production) becomes stable, respectively as an annual rate for the growth of production volume, net profits attractive for the investor and rising etc.

- Generally, for industrial companies, with a normal technical endowment and a rising field, the cash flow prediction is done for a period of 5-10 years. It is accepted that, after this period, the credibility of forecasting become smaller and smaller due to higher incertitudes, according as rising
the time horizon for predictions. Usually, a 10 years time period is chosen when the company has a long exploitation history, while for younger companies, the optimum time period is considered to be 5 years. For the situation present now in our country, we consider that a horizon of financial prediction for 5 years is the most appropriate for making pertinent estimations for cash flows.

- **non-explicit forecasting period**, when cash flow can not be credible calculated for each year. As a global expression of whole cash flow, realizable in this period (of which duration is included between the end of the explicitly forecasting period and the infinite), it is calculated the company residual value (terminal or continuous) \( V_{rez} \).

The determination as correct as possible of the size of the residual value (terminal or continuous – continuing value) has a great importance in the evaluation assembly using the DCF method.

The residual value represents the company value after the explicit forecasting period.

For calculating this value there are used **two methods**:

- **accounting proceeding**, according to which the residual value is equal with the net asset at the end of the period reduced with the costs of liquidation, namely the net liquidating value. Therefore, this **liquidation method** supposes that the most conservative calculation method for the residual value is based on the idea that the company will be liquidated at the end of the forecasting horizon.

Also, another calculation method for the residual value is by correcting the net profit in the last year with a **residual multiplier** \( Z \).

Frequently, the residual value is determined by correcting the cash flow in the last year of prognosis using the residual multiplier.

The residual multiplier depends on the sector of activity the company is part of. For developed countries, this is **between 3 and 6**. Another method to determine the \( Z \) is the **Gordon model**, namely:

\[
Z = \frac{1}{CMPC - g}
\]

where:

- CMPC – balanced average cost of capital;
- \( g \) – constant rate for the annual growth of cash flow for long time period; if the predictions are made on current prices, \( g \) must be mentioned in current prices, and if the predictions are made in constant prices, also \( g \) must be mentioned in the same type of prices (so, deflated).

Therefore the calculation formula for the residual value, in this case, is the following:

\[
V_{rez} = Z \cdot CF_n
\]

- **financial proceeding**, according to which the company residual value equals the amount of discounted cash flows which the company will be capable to educe beyond the prognosis period. Concretely, this supposes an extrapolation of cash flow in the last designing year.

In this proceeding we meet the following methods:

- perpetuities method;
- PER method.

**Perpetuities method** supposes that the company future cash flows shall be continuous. This method encloses two sub-methods:

- method of constant perpetuities;
- method of rising perpetuities.

**Method of constant perpetuities** supposes that the company will generate cash flows continuously. The calculation formula is:

\[
V_{rez} = \frac{CF_n}{K}
\]

where:

- \( k \) – discounting rate.
**Method of rising perpetuities** supposes a continuous rise of companies cash flows with a growth rate. The calculation formula is:

\[ V_{rez} = \frac{CF_n (1 + g)}{K - g} \]

where:
- \( k \) = rate of own capital cost.

**PER method** supposes that the best way to determine the residual value is to use the market price to establish a relevant PER. The calculation formula is:

\[ V_{rez} = PN_n \cdot \text{PER}_\text{comparativ} \]

where:
- \( PN_n \) = net profit in year \( n \);
- \( \text{PER}_\text{comparativ} \) = a company PER similarly quoted or an average PER per economy.

Referring to the residual value, we can notice the following rules:
- residual value is the company value at the end of the last “\( n \)” year of explicit forecasting;
- as much as \( n \) is bigger, the discounting rate is bigger, as much the residual value is reduced getting close to zero – and it is even zero if we exceed 15-20 years of prognosis;
- as much as \( n \) is smaller, the discounting rate is reduced too, as much the residual value is higher.

The method is based on the evaluation of actions by forecasting on a horizon of 5-10 years of the cash flows available for shareholders, cash flows taking into account: net current profit (after taxation), adding the redemption and the provisions and minus the capital expenses (investments), minus the raise of operating capital, plus the raise of debts bearing interests, after taking out of these the repayment of credits.

The calculation formula:

\[ V_0 = \sum_{p=1}^{n} \frac{CFNA_p}{(1 + k)^p} + \frac{V_{\text{terminal}a_n}}{(1 + k)^n} \]

where:
- \( V_0 \) = company value
- \( CFNA_p \) = net cash flow available for shareholders in \( p \) year;
- \( V_{\text{terminal}a_n} \) = terminal value (residual) at the end of \( n \) year;
- \( n \) = prognosis horizon;
- \( k \) = discounting rate (usually the balanced average cost of capital - CMPC of WACC - weight average cost of capital).

### 3. The application in practice the method of discounted cash flow

We will point out the application in practice the method of discounted cash flow using the example of S.C. RO LEASING S.A. Craiova, company having as object of activity the financial leasing for movables and fixed property for clients in almost entire country.

Although the company was set up 5 years ago, it acquired a registered capital of 13 billions lei, contract which generated incomes of almost 300 billions lei. The company is set out only by capital accounts, and its development perspective needs high financial sources, a fact that determined the Supervisory Board to propose the General Meeting of Shareholders a growth of registered capital with 6-9 billions lei, a fact that imposes the evaluation of shares.

Discounting rate, \( k \), is the minimum rate of profitability an investment must acquire in order to satisfy the shareholders requirements of profitability. In case of S.C. RO LEASING S.A., the discounting rate is the cost of capital accounts, as the company is not set out from other sources.

The determination of shares value supposes to follow the next steps:

1. **CFNA forecasting of 2004-2008 horizon.**
   This is performed as follows:
### Performances Forecasting

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total incomes*</td>
<td>29,442.8</td>
<td>26,200</td>
<td>29,820</td>
<td>26,700</td>
<td>24,735</td>
</tr>
<tr>
<td>2</td>
<td>Expenses at 1000 lei</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total incomes - lei</td>
<td>823,6</td>
<td>883</td>
<td>880</td>
<td>870</td>
<td>860</td>
</tr>
<tr>
<td>3</td>
<td>Total expenses</td>
<td>24,247,9</td>
<td>23,150</td>
<td>26,250</td>
<td>23,230</td>
<td>21,300</td>
</tr>
<tr>
<td>4</td>
<td>Gross profit</td>
<td>5,194,9</td>
<td>3,050</td>
<td>3,570</td>
<td>3,470</td>
<td>3,435</td>
</tr>
<tr>
<td>5</td>
<td>Net profit</td>
<td>3,861,1</td>
<td>2,250</td>
<td>2,600</td>
<td>2,600</td>
<td>2,580</td>
</tr>
<tr>
<td>6</td>
<td>Redemption</td>
<td>330</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>7</td>
<td>Investments</td>
<td>620</td>
<td>150</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>8</td>
<td>Growth for the need of working capital (NFR)**</td>
<td>4,254,4</td>
<td>-1,453</td>
<td>217</td>
<td>-187</td>
<td>-118</td>
</tr>
<tr>
<td></td>
<td>CFNA (5+6-7-8)</td>
<td>-683,3</td>
<td>3,903</td>
<td>2,613</td>
<td>2,937</td>
<td>2,848</td>
</tr>
</tbody>
</table>

*Prognosis of real incomes

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>From contracts at 31.12.2003 ($)</td>
<td>378,000</td>
<td>75,790</td>
<td>24,380</td>
<td></td>
</tr>
<tr>
<td>From contracts at 31.12.2004 ($)</td>
<td>331,200</td>
<td>224,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>From contracts at 31.12.2005 ($)</td>
<td>189,000</td>
<td>252,000</td>
<td>189,000</td>
<td></td>
</tr>
<tr>
<td>TOTAL rate leu/$ Incomes millions lei</td>
<td>898,200</td>
<td>33,200</td>
<td>29,820</td>
<td>189,000</td>
</tr>
<tr>
<td>From contracts 2006</td>
<td>189,000</td>
<td>252,000</td>
<td>189,000</td>
<td></td>
</tr>
<tr>
<td>TOTAL rate leu/$ Incomes millions lei</td>
<td>740,590</td>
<td>36,000</td>
<td>26,700</td>
<td>189,000</td>
</tr>
<tr>
<td>From contracts 2007</td>
<td>654,380</td>
<td>37,800</td>
<td>24,735</td>
<td></td>
</tr>
<tr>
<td>TOTAL rate leu/$ Incomes millions lei</td>
<td>189,000</td>
<td>630,000</td>
<td>24,760</td>
<td></td>
</tr>
</tbody>
</table>

Contracts 2004 = 562,500 $ inclusive VAT
2004 = 472,700 $ without VAT

Incomes for 2 years (472,700x168=795,200)

Encashment
- 30% in 2004
- 40% in 2005
- 30% in 2006

Contracts 2005 = 500,000 $ inclusive VAT
2005 = 420,000 $ without VAT

Incomes for 2 years (420,000 x 1,5 = 630,000 $)
5.1.1
5.1.2 Encashment 2005 2006 2007 189,000 252,000 189,000

** Prognosis for the growth of NFR
NFR = Stocks + Book debts + Regulating assets – Current debts – Regulating liabilities

NFR \(_{2003}\) = 4.368,8 - 1.343,9 = 3.024,9 mil. lei

NFR \(_{2002}\) = 3.415,2 - 4.644,7 = -1.229.5 mil. lei

Ratio NFR\(_{2003}\) in total incomes = \(\frac{3.024.9}{29.442.8}\) = 10,3%

NFR\(_{medium\ 2002-2003}\) = \(\frac{3.024.9 - 1.229.5}{2}\) = 897,7mil.lei

Ratio NFR\(_{medium\ in\ total\ incomes\ 2003}\) = \(\frac{897,7}{29.442.8}\) = 3%

Taking into consideration the high track between the two ratios, we considered as relevant to choose a value placed in this interval, respectively 6%.

Annual growth of NFR

<table>
<thead>
<tr>
<th>Year</th>
<th>Total incomes</th>
<th>NFR/VT</th>
<th>NFR</th>
<th>Growth NFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>29.442.8</td>
<td>0.103</td>
<td>3.024.9</td>
<td>-1.453</td>
</tr>
<tr>
<td>2004</td>
<td>26.200</td>
<td>0.06</td>
<td>1.572</td>
<td>+217</td>
</tr>
<tr>
<td>2005</td>
<td>29.820</td>
<td>0.06</td>
<td>1.789</td>
<td>-187</td>
</tr>
<tr>
<td>2006</td>
<td>26.700</td>
<td>0.06</td>
<td>1.602</td>
<td>-118</td>
</tr>
<tr>
<td>2007</td>
<td>24.735</td>
<td>0.06</td>
<td>1.484</td>
<td>+2</td>
</tr>
<tr>
<td>2008</td>
<td>24.760</td>
<td>0.06</td>
<td>1.486</td>
<td></td>
</tr>
</tbody>
</table>

2. The determination of the discounting rate (K)

According to Gordon and Shapiro formula, the cost rate of capital account is given by the:

\[ K = \frac{D_1}{P_0} + g; \]

\[ g = b \cdot R_f; \]

where:

- \(D_1\) = dividend per action for next year (2004);
- \(P_0\) = share current price (book value\(_{2003}\));
- \(g\) = rate of constant annual growth of dividend;
- \(b\) = capitalization rate for net profit;
- \(R_f\) = financial profitability (net profit / capital account).

\[ K_{2003} = \frac{26.983,135}{233,568} = 0.1156 + 8.24\% = 19.8\%; \]

\[ g = b \cdot R_f = 40\% \times 20.6\% = 8.24\%; \]

\(R_f\)\(_{2003}\) = 20.6%

3. Forecasting the terminal value at the end of year 2008

\[ V_{\text{terminal\ 2008}} = \frac{CF_{2008}}{K - g} = \frac{2.923}{0.198 - 0.0824} = \frac{2.923}{0.1155} = 25.300 \text{ mil. lei}; \]

4. Value determination per share

a. Determination of discounted cash flow available for shareholders:
### Table 1

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CFNA</td>
<td>3.903</td>
<td>2.613</td>
<td>2.937</td>
<td>2.848</td>
<td>2.923</td>
<td></td>
</tr>
<tr>
<td>2. Discounting factor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>corresponded to the rate of 19.8%</td>
<td>0.83</td>
<td>0.70</td>
<td>0.58</td>
<td>0.49</td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td>3. CFNAdiscounted</td>
<td>3.240</td>
<td>1.829</td>
<td>1.703</td>
<td>1.396</td>
<td>1.185</td>
<td>9.353</td>
</tr>
</tbody>
</table>

b. Determination of discounted terminal value

\[ V_{\text{terminal 2008}} = 25.300 \times 0.41 = 10.373 \text{ mil. lei} \]

c. Company value

\[ V_o = 9.353 + 10.373 = 19.726 \text{ mil. lei} \]

No of shares = 80,050

\[
\text{Value per share} = \frac{19,726}{80,050} = 246.420 \text{ lei}
\]

### 4. Conclusions

Although it seems quite simple, the discounted cash flow method is, as we stated at the beginning of this article, very complex due to the fact that it is based on several elements which must be evaluated, so the subjectivism plays a very important role. The predictions of some cash flows, residual value, rated average cost (and, implicitly, of the discounting rate) is very difficult to perform for companies which are not quoted in the stock market. According as more and more companies shall be quoted at the Stock Market in Bucharest, this method will be used more often also in our country, given the fact that it also has the main advantage as it is more complete and satisfying from the conceptual point of view.

### Bibliography:


