

# Valuation of Companies

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*This paper deals with valuating telecommunications companies. Six groups operating mainly in the European countries are compared. The comparison is based on financial and techno-economic indicators.*

*These indicators are used to value the company by the DCF method. However, many companies have only a very short history. To value these, classical methods like DCF or real options are not suitable. In this case, methods based on market confrontation seem to be efficient. A further exploration of these methods is also the topic of my graduate studies.*

*Keywords: Valuation, companies, DCF, indicator, market confrontation.*

## 1 Introduction

There are a vast number of telecommunications groups in Europe. To pick the companies for the valuation presented, the following criteria were used:

- Quality of the web page (English version),
- Negotiability on the stock market,
- Stability and integrity in accounting principles,
- Stability in the structure of the group.

The companies were selected on the basis of these criteria between 2002 and 2005.

I selected the following six telecommunications operators [1]:

- OTE (Greek),
- Czech Telecom (CT) (Czech),
- Swisscom (Swiss),
- Telekom Austria (TA) (Austrian),
- Telenor (Norwegian),
- TeliaSonera (TS) (Swedish-Finnish).

Each of these companies has a division that deals with the mobile segment and also a division that runs fixed lines. There are significant distinctions between the companies. For example, Czech Telecom and Swisscom operate only in their home countries, while the others have subsidiaries also in other European countries (some of them in Asia).

## 2 Techno-economic indicators

The first part of the comparison is based on techno-economic indicators.

The following absolute size indicators were chosen:

- Number of customers,
- Number of employees,
- Revenues,
- EBITDA – earnings before interest, taxes depreciation and amortization,
- CAPEX – capital expenditures,
- ARPU – average revenue per user – revenue generated by a mobile customer per month.

Subsequently, several relative indicators were evaluated and used to compare the companies.

The highest numbers of customers are reported by the northern groups, Telenor and TeliaSonera. The highest numbers of employees are found in the OTE group, but during the monitored years, the number decreased dramatically. The progression of the other indicators is very variable.

## 3 Financial indicators

I decided to divide the financial indicators into three main groups:

- Profitability indicators,
- Altman's Z-score,
- Stock market indicators.

The currency conversion between EUR, SEK, CHF, NOK and CZK is based on the exchange rate issued by the Czech National Bank.

### 3.1 Profitability indicators

The following ratios were used [2]:

- ROA – return on assets,
- ROE – return on equity,
- ROS – return on sales.

Each of these was calculated in two variants, one using EBIT and the other using net profit in the numerator.

### 3.2 Altman's Z-score

The Edward Altman Z-score formula for predicting bankruptcy is a multivariate formula for measuring the financial health of a company. It is a powerful diagnostic tool forecasting the probability that the company will go into bankruptcy. The Z-score bankruptcy predictor combines five common business ratios, using a weighting system calculated by Altman to determine the likelihood of a company going bankrupt.

$$Z = 1.2 * A + 1.4 * B + 3.3 * C + 0.6 * D + 0.999 * E \quad (1)$$

$A$  = working capital/total assets,

$B$  = retained earnings/total assets,

$C$  = EBIT/total assets,

$D$  = market value of equity/book value of liabilities,

$E$  = sales/total assets.

If the score is 3.0 or above – bankruptcy is not likely. If the score is 1.8 or less – bankruptcy is likely. A score between 1.8 and 3.0 is the gray area [5].

Table 1: Altman's Z-score

Year	2002	2003	2004	2005
<b>CT</b>	1.979	1.202	2.480	4.586
<b>OTE</b>	1.789	1.642	1.659	1.586
<b>Swisscom</b>	3.576	4.022	4.906	4.692
<b>TA</b>	0.793	1.311	1.841	1.950
<b>Telenor</b>	1.119	2.109	2.380	1.441
<b>TeliaSonera</b>	1.204	2.334	2.763	2.735

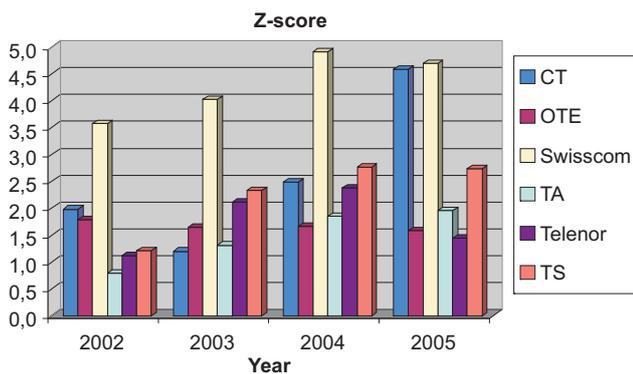


Fig. 1: Altman's Z-score

In this case, the use of the Z-score formula is disputable, because this model was created in 1968 for the American companies. I use it only to compare the groups, not to predicting bankruptcy.

The highest score is achieved by Swisscom. Another interesting result is displayed by CT for years 2004–2005, due to the sale of unneeded assets (especially phone boxes).

### 3.3 Stock market indicators

Each of the selected companies is listed on a public stock exchange.

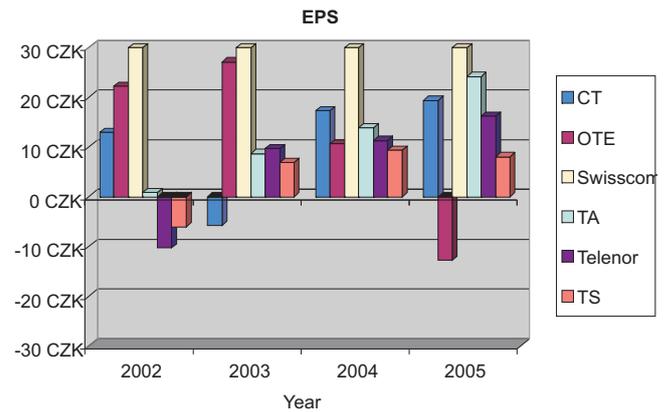
#### 3.3.1 Earnings per share

The EPS indicator informs shareholders about the net profit that can be paid as a dividend.

$$EPS = \frac{\text{net profit}}{\text{number of shares}} \quad (2)$$

Table 2: Earnings per Share –EPS (in CZK)

Year	2002	2003	2004	2005
<b>CT</b>	12.96	-5.72	17.27	19.40
<b>OTE</b>	22.27	27.15	10.65	-12.83
<b>Swisscom</b>	490.79	492.95	475.41	613.48
<b>TA</b>	0.81	8.70	13.85	24.20
<b>Telenor</b>	-10.36	9.73	11.33	16.24
<b>TeliaSonera</b>	-6.05	6.93	9.36	8.05

Fig. 2: EPS (for better lucidity the values are shown only from  $\langle -30; 30 \rangle$ )

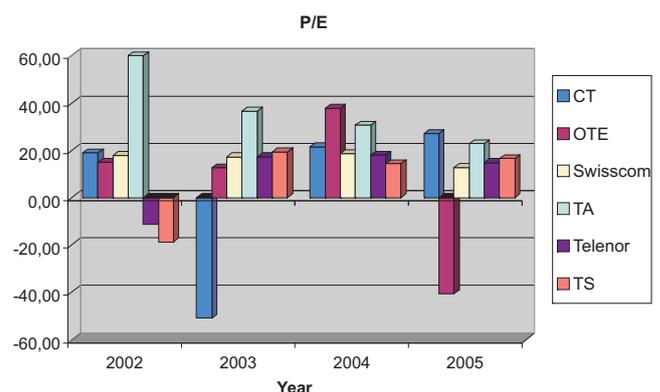
#### 3.3.2 Price to earnings ratio

The P/E ratio of a stock (also called its „earnings multiple“, or simply „multiple“, „P/E“, or „PE“) is used to measure how cheap or expensive its share price is.

$$\frac{P}{E} = \frac{\text{price per share}}{\text{earnings per share}} \quad (3)$$

Table 3: Price to earnings – P/E

Year	2002	2003	2004	2005
<b>CT</b>	18.88	-50.94	21.38	27.04
<b>OTE</b>	14.90	12.51	37.83	-40.70
<b>Swisscom</b>	17.76	17.24	18.61	12.61
<b>TA</b>	377.28	36.50	30.69	22.77
<b>Telenor</b>	-11.12	17.21	17.96	14.82
<b>TeliaSonera</b>	-18.73	19.36	14.35	16.39

Fig. 3: P/E (for better lucidity the values are shown only from  $\langle -60; 60 \rangle$ )

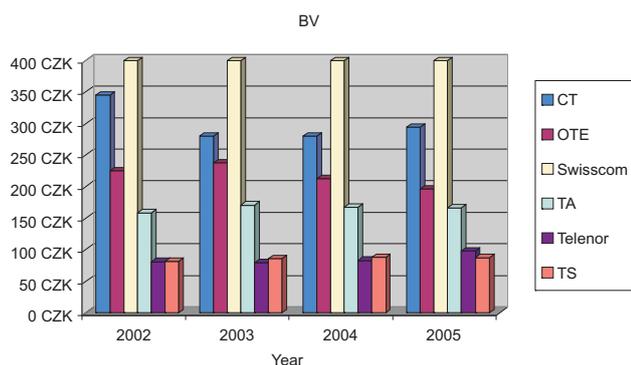
#### 3.3.3 Book value

The book value is the shareholders' equity of a business (assets – liabilities), as measured by the accounting 'books'.

$$BV = \frac{\text{equity}}{\text{number of shares}} \quad (4)$$

Table 4: Book value –BV (in CZK)

Year	2002	2003	2004	2005
CT	345.47	279.88	280.02	294.87
OTE	224.93	237.36	212.73	195.96
Swisscom	2 399.4	2 409.5	1 992.6	1 820.7
TA	158.60	171.06	167.05	166.46
Telenor	81.19	79.49	79.48	98.55
TeliaSonera	81.61	85.80	87.85	87.40

Fig. 4: BV (for better lucidity the values are shown only from  $\langle -30; 30 \rangle$ )

## 4 Comparison of the companies

In most of the ratios used here the best values are achieved by Swisscom. Telekom Austria takes second place. The subsequent places are occupied by the northern groups, Telenor and TeliaSonera, which are not consolidated as they made many acquisitions between 2002 and 2005. In upcoming years they will restructure and consolidate. The fifth place goes to CT, which is being restructured at the present time. The last position is occupied by the Greek operator, OTE.

## 5 Methods of valuation

One way of categorizing valuation methods is as follows [3]:

- Market based – comparable market transactions or comparable companies. These methods assume that the value of the company can be determined by using as a reference market information on companies with similar characteristics as the company being valued.
- Income based – perhaps the most commonly-used set of valuation methods in the context of small-to-medium company acquisitions. Financial performance methods attempt to measure historical performance and also to predict future performance in determining the value of the seller's business to the buyer on a post-closing basis:
  - Capitalization of profits,
  - DCF,
  - Gross profit differential method,
  - Excess profits method,
  - Real options.

- Asset based – e. g. historical or replacement cost. If a company has a large portion of its value wrapped up in fixed assets, an appraiser may lean toward some type of asset valuation when attempting to price it.

Each of the methods mentioned above has its own pros and cons. Selection of the optimal method depends on the following considerations:

- History of the company (short, long),
- Type of company (private, public),
- Required accuracy of calculation and its complexity,
- Business cycle of the company.

## 6 Purpose of valuation

Based on the character and extent of the available information about the company being valued and the actual purpose of the valuation itself, using a single method, various values can be obtained:

- Open-market value,
- Estimated realization value,
- Existing use value,
- Estimated restricted realization price,
- Depreciated replacement cost.

## 7 Valuation of Czech Telecom

The DFCFF method [4] was chosen for the valuation here. CT was valued to January 1<sup>st</sup> 2006. SWOT and competition analyses were carried out, and the indicators calculated in the previous part were used to predict the cash flow.

$$FCFF_t = EBIT_t * (1 - t) + DEP_t - \Delta WC_t - INV_t \quad (5)$$

- $FCFF_t$  – free cash flow to the firm,
- $EBIT_t$  – earnings before interest and taxes,
- $t$  – taxes,
- $DEP_t$  – depreciation,
- $\Delta WC_t$  – change in working capital,
- $INV_t$  – investments.

For the valuation, a two-phase model was used:

$$V_b = \sum_{t=1}^{t=n} \frac{FCFF_t}{(1+WACC)^t} + \frac{FCFF_{n+1}}{WACC - g_n} * (1+WACC)^{-n} \quad (6)$$

- $V_b$  – gross value,
- $WACC$  – weighted average cost of capital,
- $g_n$  – growth.

The share price:

$$SP = \frac{V_n}{NS} = \frac{V_b - FC}{NS} \quad (7)$$

- $SP$  – share price,
- $V_n$  – nett value,
- $FC$  – foreign capital,
- $NS$  – number of shares.

For calculating  $WACC$  and the cost of the own capital, the CAPM model was used.

The shares were valued at a price of CZK 580. The actual share prices at the Prague Stock Exchange on December 30<sup>th</sup>,

2005 and January 1<sup>st</sup> 2006 were 524.50 CZK and 527 CZK, respectively [1].

## 8 Conclusion

Six telecommunications groups were compared using techno-economic and financial indicators. Swisscom achieved the best values across most of the criteria considered.

Subsequently, several of these indicators were employed for a valuation of Czech Telecom by the DFCFF method. The shares were valued at CZK 580. On December 30<sup>th</sup> 2005 and January 1<sup>st</sup> 2006, the actual share prices at the Prague Stock Exchange were 524.50 CZK and 527 CZK respectively.

The DFCFF method was chosen based on the characteristics of CT. This is a public company and its shares are traded on the Prague Stock Exchange. A sufficient amount of information about CT is publicly available, including data from the past years. Information for predicting the company's future can be also found. The forecast of future revenues and expenses is the most important aspect of valuing the company using DCF methods. Another important step is to determine WACC. For this purpose, historical data from the Prague Stock Exchange was used. A sensitivity analysis on changing initial expectations was also conducted, see [1].

My future work will be on valuing companies with a short history of existence. Historical data cannot be used, and hence it is complicated to predict the future. So far, a no

unified theory is available for such cases. The market confrontation method may deal sufficiently with this issue, and this will be the focus of my work.

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