Analysis of Building Sector Performance

Vojtech Stehel¹, Radimir Novotny¹, Ales Kankovsky¹
¹The Institute of Technology and Businesses in Ceske Budejovice, Czech Republic

Abstract. Economic performance of a company depends on many factors. They can include factors easy to influence by the company (internal factors) or factors that are very difficult to influence (external factors). An example of an external factor is e.g. the development of the economy. Internal factors include e.g. assets structure and liabilities. Other factors which might be influenced by a company are income structure and diversification. The contribution analyses a structure of these parameters for building companies in the Czech Republic between 2012 and 2017. For the analysis, statements of the Czech Statistical Office for the companies with more than 500 employees were used. The statistical survey was conducted 4 times a year; obligatory participation of the companies in the survey resulted from the obligations related to the legislation in force. Company performance assessment is based on the Economic Value Added (EVA) considering not only the performance as such (profit) but also the risk that the company or owner takes in the market. For the analysis, especially financial analysis tools are used, when financial statements of building companies in the given economy are analysed. Furthermore, statistical methods for assessing categories of companies are used with the aim to describe clearly the significant differences between the individual categories. In total, 4 categories were determined (ranging from the best-performing companies to the companies where a collapse is very likely). The objective of the analysis is to identify an optimal structure of a building company (machines, inventory, or material), a method of its financing, and a suitable diversification of income sources from the perspective of financial statement. The results show that significant differences in these structures can be identified and that the individual structures have a great impact on the overall company performance. In practice, the results of the analysis create a benchmark for building company management in the given economy. The analyses took into account seasonality typical for the given sector.

1. Introduction
Achieving profit was considered as the primary goal of a business firm in the past. However, later many experts disavowed this proposition [1]. The reason was that authors perceived increasing value for owners as the primary goal of a business firm. A higher value for owners can have a positive influence on the value of long-term net income realized by owners in comparison with a situation where they receive a share in profit. The reason lies in tax legislation which allows to exempt income earned from selling shares from income tax under certain conditions [1]. Some authors even disapprove the above statements and claim that the primary goal of a business firm is to survive [2]. This view of the fact may lead to a short-term or mid-term reduction of value or profit. Every approach mentioned above is logical and can be understood like that from the point of view of the specific stakeholder. In other words, there can be an owner who is not interested in the long-term survival of the firm. His goal may be, for example, to divide the firm and obtain valuable and less...
valuable assets for the purpose of resale with value added since an external observer will be unable to
assess the price adequately. Thus the above goals will be irrelevant to him.

However, our study was focused on the standard approach and we analysed the performance of a
business firm which more or less affects the value of the firm. The firm's value can be assessed using a
number of methods [3]. One of the common methods is EVA (Economic Value Added) [4]. The EVA
indicator not only reflects the attained financial result, but also the risk undertaken to achieve the
result [5, 6, 7]. As a general rule, the best investment is the most profitable and least risky one.

The main purpose of the paper is to analyse the financial and capital structure of a business firm.
This analysis should identify an optimum structure leading to the best achievements with a view to
Economic Value Added. The analysis of capital structure with a view to future development of the
firm is often used for bankruptcy predictions [3]. As long as financial analysis can predict future
bankruptcy, the analysis can be used to project growth [8]. Of course, a company's growth projections
are important for many applications in practice [9, 10].

2. Methodology
The analysis was based on data collected from sector surveys of industrial companies. Specifically,
P3-04, P6-04, and P2-04 reports. Those reports are published by the Czech Statistical Office and used
as the basis for the Ministry of Industry for a quarterly analysis of the industry. [5]. We analysed data
from the Ministry of Industry for a period of 2012-2017. The analysis of the asset and capital structure
was based on the average firm model. To this end, summary values for the given sector and categories
of companies were divided by the number of companies. A similar approach was also taken by other
authors [11]. Unfortunately, more details are not publicly available, therefore data are not analysed for
dispersion (variance), or other facts of descriptive statistics.

The analysis covers business firms in the construction industry (F) according to the CZ NACE
methodology [5]. In particular, balance sheet data for a period of 2012-2017 were analysed. The data
were used for calculation of Economic Value Added as follows:

\[ EVA = (ROE - r_e) \times E \]

where \( ROE \) means the return on equity,
\( r_e \) means the alternative cost of equity,
\( E \) means equity.

The above formula shows that \( ROE \) is the return on equity without considering risk. The \( r_e \) parameter
means risk associated with equity. This risk can be calculated using the CAPM method as follows [11]:

\[ r_e = r_f + \beta \times (R_m - r_f) \]

Where
\( r_e \) ..... equity costs,
\( r_f \) ... risk-free rate of return,
\( \beta \) ... systematic risk,
\( E(R_m - r_f) \) ... risk premium.

In respect of the economy size and other parameters, the calculations were based on the build-up
model where

\[ r_e = \frac{WACC \times \frac{C}{A} - (1 - t) \times \frac{r_d}{D} \times \left( \frac{C}{A} \times \frac{E}{A} \right)}{\frac{E}{A}} \]

Where \( A \) represents total assets (i.e., balance sheet total),
E is equity,
D – debt,
rd – expense of (interest) long-term bank loans,
WACC – weighted average cost of capital.

Weighted average cost of capital shows the cost of capital determined as follows:

\[ WACC = \frac{D}{C} \cdot r_d \cdot (1 - t) + \frac{E}{C} \cdot r_e \]

Where
re – cost of equity,
rd – cost of debt,
E – equity,
D – debt.
t – tax

Or, as follows:

\[ WACC = r_f + r_{LA} + r_{business} + r_{FinStab} \]

where
\( r_{business} \) indicator function characterizing creation of productive forces,
\( r_{FinStab} \) indicator function characterizing the relationship between assets and liabilities.
\( r_f \) risk-free yield determined at the level of the interest rate on government bonds.

Determining the cost of equity is appropriate for a smaller economy as it takes some of its specifics better than the CAPM method. For these reasons, the model is often used in business valuation [3].

For the purpose of analysis, companies were divided into 4 categories:
1. Companies that create value – i.e. with ROE > re
2. Companies that have ROE in the interval (rf; re>
3. Profit making companies with ROE in the interval (0; rf>
4. Loss-making companies and companies with negative equity

The indicators of financial analysis were also subject to evaluation. In terms of finance, liquidity was the key indicator calculated as follows:

L3 liquidity = Current assets / Current liabilities
L2 liquidity = (Liabilities + Current financial assets + Resources)/(Current liabilities)
L1 liquidity = (Current financial assets + Resources) / Current liabilities

3. Results and Discussions
As previously mentioned, the analysis was based on data from surveys of the Czech Statistical Office, consequently adopted and updated by the Ministry of Industry and Trade (in particular, aggregated data across surveys). For the purpose of representative results, the number of companies involved must be known. The details are shown in the picture below (Figure 1):
The chart shows that approximately 100 companies participated in each period over the years. The data also imply certain cycles of given industry as approximately the same periodicity applies to gradual increase and reduction of the number of companies included in Category I (that create value) – namely companies with ROE exceeding the alternative cost of equity.

The specific EVA value is shown in the following chart. The seasonality of the given sector is well visible in the picture. In the previous case, companies may be shifted between categories due to many other reasons associated with the calculation of the ROE indicator. On the average, the EVA indicator provides better visibility of the given sector performance. It is obvious that maximum economic values are achieved by the construction industry at the beginning of the year. This is most likely caused by many factors. Due to the impossibility to carry out some activities, seasonal labour is partly laid off or their payrolls are lowered. Another reason lies in projects necessary to be completed in the given period by the end of the year. It is interesting that seasonality is mainly seen in companies that implement ROE values above the level of alternative cost of equity. Seasonality does not appear much in other categories. For these reasons, a hypothesis comes to mind that the performance of those companies is depending on the use of all (even complicated) levers for achieving higher efficiency and effectiveness. An example may be the seasonal layoffs. Due to its extent, this hypothesis is not subject to this study and can be explored during follow-up research (Figure 2).

**Figure 1.** Number of Companies, Source: Own production from data of the Ministry of Industry and Trade
Considering financial statements, at first balance sheet was analysed to divide assets into current and non-current. The result of the analysis is shown in the picture below (Figure 3), consisting of four charts. From left to right, there are companies in Category I, II and below that Category III and IV.

Figure 2. EVA by Category, Source: Own production from data of the Ministry of Industry and Trade

Figure 3. Analysis of Assets, Source: Own production from data of the Ministry of Industry and Trade
The conclusion of the analysis is that Category I companies (the company value is increasing) have in long term a low volume of fixed assets compared to current assets. The ratio is twice or three times it. Category II companies also keep a higher level of current assets, but the ratio is lower. Category III and IV do not show a clear ratio and values are very often overlapping, or it may even be that non-current assets are exceeding current assets. In conclusion, the structure of assets is very significant and can be indicative for the prediction of a company’s performance in the construction industry.

Charts identified in the first stage of the analysis of liabilities did not correspond with reality. An example is illustrated in Figure 4. It clearly shows that equity was mistaken for total assets in the period of Q1-4 2012 and 2014.

**Liabilities**

![Figure 4](Image)

**Figure 4.** Error – Liabilities, Source: Own production from data of the Ministry of Industry and Trade

Because of this very obvious error, details of the above quarters were corrected and equity was recalculated based on other data from financial statements. The results are shown in the picture below (Figure 5).
Figure 5. Liabilities, Source: Own production from data of the Ministry of Industry and Trade

The above data show a slight difference between the categories of companies. Liabilities are mostly greater than equity. In other words, it is quite common for the company to have a debt exceeding its equity. For Categories I, II and III, however, this ratio is about equal. The debt to equity ratio is much higher in the category of loss-making companies or companies with negative equity. There are two possible reasons. First, the amount of debt and cost associated with the operation of the debt can result in the negative trend of net income. The other possible reason is that companies with negative cumulative equity from past years may adversely affect the statistical file, thus even an average company. We incline to the latter because of relatively less different results across categories. Nevertheless, the hypothesis can be subject to further investigation.

Liquidity is one of the key levers of corporate management. If liquidity is too high, it can lead to inefficiency associated with the possession of capital which does not contribute to value added. If liquidity is too low, a short-term loss of income can have a considerably adverse effect on the business. It can lead to bankruptcy in extreme cases. The picture below shows a trend of liquidity for different categories of companies. The setting of categories is identical to the previous case. The pictures clearly show there is no big difference in liquidity between the categories of companies. L1 liquidity is about 0.5 across all companies and L2 liquidity is ranged from 1 to 2. For L2 liquidity, there is a slight difference between categories. L2 liquidity is slightly higher in Category I companies (that create value). L3 liquidity is a little higher than L2 which is caused by the construction of the indicator. The increase is about the same across all companies (Figure 6).
4. Conclusions
The aim of this paper was to analyse the structure of assets and liabilities in the accounting system depending on how a given type of company creates value. We analysed about 100 companies. They were divided into four categories. The major business of all companies is Construction (Category F according to CZ NACE). The analysis covered assets and liabilities followed by liquidity.

The analysis of assets identified significant differences between companies. Companies that create value showed a much greater ratio of current assets against non-current assets. In other cases, the difference was getting lower depending on the category, or even non-current assets exceeded current assets.

In terms of liabilities, the equity to liabilities ratio was similar in all categories. Liabilities were exceeding equity nearly in all cases. The only difference is that the debt to equity ratio is much higher in the category of loss-making companies or companies with negative equity. There are two possible reasons. First, the amount of debt and cost associated with the operation of the debt can result in the negative trend of net income. The other possible reason is that companies with negative cumulative equity from past years may adversely affect the statistical file, thus even an average company. We incline to the latter because of relatively less different results across categories. Nevertheless, the hypothesis can be subject to further investigation.

In terms of liquidity, no major differences were identified between companies. The only difference was that companies in Category I had a slightly higher L2 liquidity (approximately 1.5). Further, we analysed Economic Value Added for the given industry. It was concluded that given sector is fairly seasonal which reflects the physical basis of the industry (it is not possible, or cost-effective to implement some construction projects in winter season). It is interesting that seasonality is mainly seen in companies that implement ROE values above the level of alternative cost of equity. Seasonality does not appear much in other categories. For these reasons, a hypothesis comes to mind that the performance of those companies is depending on the use of all (even complicated) levers to achieve higher efficiency and effectiveness. An example may be the seasonal layoffs. The impact of seasonality on companies in Category I can be examined in follow-up studies.

References
[1] E. Kislingerová, Manažerské finance (Managerial Finance). Second revised and expanded edition. Prague: C. H. Beck, 2007, ISBN 978-80-7179-903-0.
[2] T. Kliešťik, V. Jaromír and Z. Rowland. Bankruptcy prediction in Visegrad group countries using multiple discriminant analysis. Equilibrium-Quarterly Journal of Economics and Economic Policy, Torun, Polsko: Inst Economic Research-Poland, y. 13, no. 3, pp. 569-593,
2018, ISSN 2353-3293.

[3] M. Mařík. Metody oceňování podniku: proces ocenění - základní metody a postupy. 3., upr. a rozš. vyd. Praha: Ekopress, 2011. ISBN 978-80-86929-67-5.

[4] S. Chen, and J. Dodd. Economic Value Added (EVA™): An Empirical Examination Of A New Corporate Performance Measure. Journal of Managerial Issues, 9(3), 318-333, 1997.

[5] Ministry of Industry and Trade. Finanční analýza průmyslu a stavebnictví 2012 - 2017 (Financial analysis of industry and construction industry 2012 – 2017) [online]. [Accessed 20. 4. 2019]. Available at: <https://www.mpo.cz/cz/rozcestnik/analyticke-materialy-a-statistiky/analyticke-materialy/>.

[6] I. Neumaierová, Řízení hodnoty (Value Management). Prague: University of Economics in Prague. Faculty of Business Administration. pp 137, 1998, ISBN 80-7079-921-8.

[7] I. Neumaierová, Aplikace řízení hodnoty (Value Management Application). Prague: University of Economics in Prague. Faculty of Business Administration, 95 pp, 2003. ISBN 80-245-0536-3.

[8] M. Vochozka, and V. Machová. Determination of value drivers for transport companies in the Czech Republic. Nase More, Dubrovnik: University of Dubrovnik, roč. 65, č. 4, s. 197-201, 2018. ISSN 0469-6255.

[9] G.B. Stewart, The Quest for Value: A Guide for Senior Managers. New York, NY: HarperCollins, 1991.

[10] R. A. Brealey, S. C. Myers and F. Allen. Principles of corporate finance. 11th ed. New York: McGraw-Hill Irwin, 2013. ISBN 00-780-3476-0.

[11] M. Vochozka, Z. Rowland and J. Vrbka. Financial Analysis Of An Average Transport Company In The Czech Republic. Nase More, Dubrovnik: University of Dubrovnik, roč. 63, č. 3, s. 227-236, 2016. ISSN 0469-6255.