Abstract: Economically spoken, a company is successful if it brings higher value for its owners. An increase in company value is connected with internal and external development of the business, often in the form of acquisitions and mergers. The subject of this paper is mergers of Czech companies which took place between 2001 and 2009. The study focuses on changes in the structure of ownership in particular quarters of the monitored period and the development in ownership relationships among participating entities. The analysis uses temporal series containing numbers of mergers and volumes of assets of participating entities. The results of the analysis have confirmed a slight increase in the number and volume of mergers implemented under foreign owners’ control in contrast to entities controlled by domestic owners. They have also identified waves of mergers within an annual cycle reflecting the timing of the decisive day and the preparation of the starting balance sheet as of the first day of a new accounting and taxation period. In the Czech conditions, mergers under foreign successor company control prevail, while mergers under domestic control have a negative trend in the monitored period. A positive development trend has been proved for mergers implemented under control by only one owner of all participating entities.

Key-Words: company transformations, mergers and acquisitions, foreign owners, domestic owners, macroeconomic environment, regression and correlation analysis

1 Introduction
The need of larger investments in business and the effort to stabilize position of some companies in the USA at the end of the 19th century led to combinations of companies and creation of stronger economic units which was later referred to as mergers and acquisitions (M&A). The study into the historical development of company combinations, specifically mergers and acquisitions (M&A), has proven that activities in the M&A market did not happen evenly but they fluctuated in dependence on the level of the economic environment, the development of financial markets and mainly the ideas of bidders and target businesses about the price of a takeover. Some authors in this respect use the term merger and acquisition waves – these waves come at a certain level of development of an economy. E.g. Levy and Sarnat[8] talk about 3 waves, Bobenič-Hintoš[2] mention 4 waves, Bruner [4] divides the fourth wave into two: a) and b), Martynova and Rennebook[10] differentiate 5 waves, Lipton [9] identifies 6 waves of mergers and acquisitions. In each wave of mergers and acquisitions we can find sensible motives for company combinations which correspond to the degree of the development of society. As regards economic motives, investors or the management believe that two or more businesses together will be of more value than separately. Implementation of these combinations is supported by generally valid economic laws, such as economies of scale in relation to horizontal mergers, economies of vertical integration, non-used tax shields, removal of low production efficiency, diversification, lower financial costs, etc. We may think, together with other authors [4] that at the top of the economic cycle businesses have free cash funds and acquisitions and mergers represent good investment opportunities for them. A transformation can bring a higher economic potential as regards competitiveness than repeated investments in company internal changes, construction of new plants, implementation of new technologies, etc. The growth of world economy promotes efforts towards concentration of capital and application of acquisitions and mergers in a global scale [7].
Looking at the opposite stage of the economic cycle, in the period of economic problems and low capital prices in financial markets activities in the area of mergers and acquisitions should increase, not slow down. The economic motive is probably somehow related to growing markets, when purchase is more intensive. Although we are unable to explain the timing of merger and acquisition (M&A) waves reliably [3], we can deduce dependence between the economic cycle and activities in the M&A market.

Our previous empiric studies [11] proved that the Czech M&A market behaves in a way similar to markets in developed countries. If the growth of performance of companies affects macroeconomic indicators positively and, vice versa, the decrease in economic growth is reflected in business negatively, there should logically be some relationship with the level of activities in the field of company combinations. The decreasing entrepreneurial trust, decreases in expenses on capital investments, lower demand for imports, slump of financial markets and heavy price discounting will probably be reflected in a reduction of activities in the M&A market [12]; on the other hand, undervalued financial markets represent an opportunity for interesting investments and an expansion of entrepreneurial activities.

This paper contains partial results of a research project whose aims are to identify problems in merger preparation in compliance with valid Czech regulations and to analyse economic causes and consequences of mergers. The initial information source is a basic dataset in the structure necessary for a statistical analysis which was created by the project team. The database contains mergers of companies which took place in the Czech Republic between 2001 and 2009 provided that the companies published their financial statements in the digital form in the collection of documents of the Trade Register [13]. Temporal series describing developmental trends of changes in the ownership structure of merging entities are analysed.

2 Problem Formulation

The theoretical definition of mergers contained within the dataset is in compliance with commercial law documents.

According to West's Encyclopedia of American Law [16] is a merger or acquisition a combination of two companies where one corporation is completely absorbed by another corporation. The less important company loses its identity and becomes part of the more important corporation, which retains its identity. A merger extinguishes the merged corporation, and the surviving corporation assumes all the rights, privileges, and liabilities of the merged corporation. A merger is not the same as a consolidation, in which two corporations lose their separate identities and unite to form a completely new corporation.

The Czech trade law 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. Unless this is a hostile takeover, also a legal takeover can take place in case of property acquisition or capital acquisition by one owner. The differences between mergers and acquisition will mainly stand out in accounting procedures [1].

In compliance with the Czech act on transformations [17] these are all implemented domestic mergers referred to as combination by which dissolved companies pass over to an existing (successor) company. A typical feature of mergers is an agreement on the combination of two or more companies into the successor one, which thus gains more advantages than the companies would have doing business separately. The merger should be of benefit to all owners (shareholders or partners) of participating companies. If the company which is defined as more significant continues and the less significant one is dissolved, there are an infinite number of opinions regarding the classification of a company from the perspective of its significance. The key factor is the opinion of participating companies owners, especially if there are some capital links among them. Table 1 presents an overview of mergers implemented in the Czech territory in the examined period. A detailed view of the progress of mergers confirms that there are regular waves within an annual cycle. The maximum amplitude is found at the beginning of a new calendar year. A logical explanation for this trend is the concurrence of the decisive day of merger with the beginning of the accounting and taxation period for most entities.
For the purpose of our investigation, we divided the implemented mergers by continuing companies, into those controlled by foreign owners and those controlled by domestic owners. As all the mergers took place in the territory of the Czech Republic and they are subject to Czech law, the temporal progress should not differ by the nationality of owners. Our first hypothesis identifies with this assumption and allows only slight deviations from the temporal progress between foreign and domestic owners. We could expect a gradual increase in mergers under foreign control because the Czech economy is evaluated as a transitional market between an emerging and a mature M&A market [5]. The advantage of the Czech economy is its long-term economic stability which was also confirmed during the financial crisis between 2007 and 2009 as this did not affect the Czech financial sector considerably [11]. On the one hand, the Czech economy should attract foreign investors as a suitable target; on the other hand, it should gain suitable target companies or be involved in their control. To confirm or reject the first hypothesis we will use a graphical analysis based on the number of combinations implemented by the two categories of owners. Two temporal series are analysed described by the polynomial regression function which manifests the greatest agreement with the data.

\[ y = ax^2 + bx + c \]  

where: \( a, b, c \) – parameters of the theoretical regression function

The dependence between development trends of mergers in companies under foreign and domestic control described by regression curves is measured using Pearson’s correlation coefficient.

\[ r_{xy} = \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2 \sum_{i=1}^{n} (y_i - \bar{y})^2}} \]  

where: \( r_{xy} \) - selected correlation coefficient  
(2)

\( X,Y \) - random quantities  
(3)

\( I \) - number of random quantities \( i \in (1, n) \)

To compare the development trend we will use regression analysis. The analysis will examine two temporal series. The first series reflects the volume of mergers implemented in particular years when the successor company is controlled by foreign owners, the second one for successor companies with domestic owners. The trend is measured by calculating proportions of both types to the total volume. Based on empirical analysis, a specific regression function is chosen suitable to describe the dependence of both quantities. The highest agreement with the data has been found for the polynomial function again. The dependence of both curves will be again measured by Pearson’s correlation coefficient. In our opinion, the trend of the analysed mergers should correspond to the temporal progress of M&A by publication UNCTAD[15]. This assumption (the second hypothesis) will be tested and confirmed or rejected.

The last hypothesis concerns ownership relationships between companies participating in a merger. The first possible option is the relationship where the successor company has control of the other companies; the second is the relationship where the other companies have control over the successor one; the third option occurs where mergers are implemented under one owner’s control over all participating companies; the fourth and last option is mergers of independent companies, i.e. without capital links. The graphical analysis compares the four temporal series reflecting the numbers of mergers within the particular categories in the monitored period. We assume a dominance of mergers under successor company’s control and a close relation to the category of mergers under one owner of all participating companies (the third hypothesis). To verify the third hypothesis we will use linear regression functions and calculate correlation coefficients.

\[ y = b_0 + b_1x \]

Regression coefficient \( b_1 \) is tested at a level of significance \( \alpha = 0.05 \) by hypothesis

\( H_0 : b_1 = 0; \) against alternative \( H_1 : b_1 \neq 0; \)

Testing criterion \( t \) is as follows:

\[ t = \frac{b_1 \sqrt{\sum_{i=1}^{n} x_i^2}}{s} \]  

Table 1: Temporal distribution of mergers in the basic dataset (number of mergers)

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>Total</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>16</td>
<td>28</td>
<td>26</td>
<td>32</td>
<td>7</td>
<td>49</td>
<td>47</td>
<td>19</td>
<td>27</td>
<td>251</td>
<td>0.70</td>
</tr>
<tr>
<td>Q2</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>65</td>
<td>8</td>
<td>0.09</td>
</tr>
<tr>
<td>Q3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>1</td>
<td>10</td>
<td>2</td>
<td>4</td>
<td>50</td>
<td>50</td>
<td>0.14</td>
</tr>
<tr>
<td>Q4</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>27</td>
<td>0.08</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>34</td>
<td>41</td>
<td>41</td>
<td>11</td>
<td>66</td>
<td>58</td>
<td>58</td>
<td>360</td>
<td>360</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Source: authors’ database
where the residual standard deviation is calculated, using equation (5)

$$s = \sqrt{\frac{\sum_{i=1}^{n} (y_i - \hat{y})^2}{n-2}}$$

3 Problem Solution

As the mentioned studies prove, waves of M&A within their historical development have been confirmed. Our dataset identifies wave occurrence also within an annual cycle. The reason for this timing of mergers is purely pragmatic as owners and management of participating companies endeavour to put in harmony the date of change implementation with the date of financial statements. Figure 1 depicting the progress of mergers in quarters shows that the maximum amplitude of the wave coincides with the beginning of the year regardless of the owners’ nationality. The development trend described by regression equations indicates a slight increase in mergers under foreign owners’ control during the monitored period:

- (foreign owners)

$$y = -0.0038x^2 + 0.1931x + 2.874; \ R^2 = 0.0133 \ (6)$$

- (domestic owners)

$$y = -0.0024x^2 + 0.1132x + 4.231; \ R^2 = 0.0025 \ (7)$$

However, with respect to the high volatility of data, the agreement of the model with the data ($R^2$) is very low for both curves. On the other hand, the calculated coefficient of correlation between the development of mergers under foreign control and development of mergers under domestic control is $r_{xy} = 0.912612528$ and indicates a strong dependence. The graphical analysis of the development trends of both curves has thus confirmed the first hypothesis.

To verify the second hypothesis, development trends of mergers at the Czech market measured by the proportion of transactions with the minimum value of assets were done. A critical period is the year 2005, which is the year just between two crises, the bank crisis in the USA (2001–2003) and the global financial crisis (2007–2009). The graph in Figure 2 shows that the greatest proportion of mergers implemented by foreign owners occurred in 2006, when transactions with the highest value of assets were done. A critical period is the year 2005, which is the year just between two crises, the bank crisis in the USA (2001–2003) and the global financial crisis (2007–2009). Mergers with the minimum value were implemented in this year. However, Pearson’s correlation coefficient $r_{xy} = 0.010986659$ manifests a very weak correlation of both curves. Statistical quantities describing the temporal series of volume proportions are presented in Table 2.
Table 2: The relationship between proportions of volume of mergers in Czech Republic

<table>
<thead>
<tr>
<th>Relative proportions</th>
<th>P_{MAX}</th>
<th>P_{MIN}</th>
<th>P_{MED}</th>
<th>Standard deviation</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of foreign owners</td>
<td>0.181</td>
<td>0.003</td>
<td>0.025</td>
<td>0.058833</td>
<td>0.10986659</td>
</tr>
<tr>
<td>Share of domestic owners</td>
<td>0.213</td>
<td>0.002</td>
<td>0.018</td>
<td>0.062394</td>
<td></td>
</tr>
</tbody>
</table>

Source: own calculations

The regression functions depicting the development trends of temporal series used to verify the third hypothesis (see Figure 3) are described by the following equations:

- (the successor company controls all the dissolved)
  \[ y = 2.3667x + 8.8333; \quad R^2 = 0.281 \quad (10) \]

- (one owner of all participating companies)
  \[ y = 1.5167x + 5.3056; \quad R^2 = 0.3933 \quad (11) \]

- (the companies being dissolved control the successor)
  \[ y = -0.5667x + 6.7222; \quad R^2 = 0.3643 \quad (12) \]

- (independent companies)
  \[ y = -0.6833x + 5.9722; \quad R^2 = 0.8187 \quad (13) \]

The graph in Figure 3 shows that a positive slope is found in regression curves described by equations (10) and (11). Their mutual dependence can be characterized as medium strong \( r_{xy} = 0.46566857 \).
Recent Researches in Business and Economics

<table>
<thead>
<tr>
<th>Number of mergers</th>
<th>$x_{\text{MAX}}$</th>
<th>$x_{\text{MIN}}$</th>
<th>$x_{\text{MID}}$</th>
<th>Standard deviation</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successor controlling the dissolved</td>
<td>46</td>
<td>4</td>
<td>19</td>
<td>11.52774</td>
<td>0.46566867</td>
</tr>
<tr>
<td>One owns all the participating</td>
<td>26</td>
<td>5</td>
<td>13</td>
<td>6.24401</td>
<td></td>
</tr>
</tbody>
</table>

Source: own calculations

4 Conclusion

As expected, we have observed a slight increase in mergers implemented by foreign owners as opposed to domestic ones. Both regression curves manifest very close dependences. The curves progress in waves within an annual interval with the maximum amplitude on the first day of the calendar year. The owners want to avoid having to create additional financial statements of participating companies. Typical motives for mergers published by e.g. Trautwein[14]are not affected by this timing. It still holds that the merger development we observed is a reflection of the macroeconomic environment in the country and the situation at financial markets. In contrast to the first hypothesis, which described activities at the Czech merger market, the second hypothesis is based on asset and capital flows. The hypothesis about a faster rise in merger volumes under foreign owners as opposed to domestic ones has been confirmed although in the following years the merger volumes dropped affected by the coming financial crisis and economic recession (2007–2009).

We assumed that the more significant company is the one that controls the other participating companies. This hypothesis has been confirmed for the successor companies only, not for the dissolved companies. Transactions implemented under one owner had a growing tendency in the field of Czech mergers. The analysis shows that when there is an existing capital link between merging companies, the problems occurring during negotiations on mergers are removed and operating costs are lower. A similar result has been achieved in some of other published partial studies, e.g. Hodes-Kropf, Viswanathan[6].

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References


