

# RETURN ON SHARES OF STEEL COMPANIES UNDER THE INFLUENCE OF MERGERS AND ACQUISITIONS

Received – Prispjelo: 2014-04-29  
Accepted – Prihvaćeno: 2014-09-20  
Professional Paper – Strukovni rad

The present article intends to assess returns on shares of the steel companies that were formed based on either merger or acquisition. The analysis included 14 operations in the steel industry. Attention was paid to returns of the companies performing acquisitions, as well as to the returns on shares that presented the acquisition target. The analysis was performed based on the “event study” method, and the analysed event was the announcement or notification of realization of an acquisition. Shares of the target steel companies as well as acquirers are attaining higher returns, but the change was not statistically significant.

*Key words:* steel company, share, acquisition, merger, event study

## INTRODUCTION

One of the effects of globalization is continuing consolidation in world steel sector. The main factors which caused steel market consolidation in recent years include mass privatization and restructuring of enterprises, liberalization of the regulations conducive to market competition, investment needs in steelworks and tendencies to create free markets in biggest world [1].

If the company wants to improve its competition on the steel market and to decrease great differences mainly in the area of work productivity, it must involve every employee in process of increasing production effectiveness [2].

From a theoretical point of view it is possible to apply the prognostic models for the forecast of a specific environment of steel companies (exploration and forecasts of changes) [3].

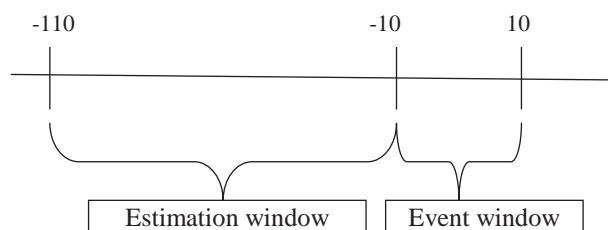
Objective of the present paper is to analyse impact of acquisition announcement on return on shares of steel companies.

## METHODOLOGY

The impact of announcement of merger or acquisition upon returns on shares of selected steel companies is examined based on utilisation of the event study method. Within the acquisition notice period analysed was the impact as on returns of the target companies so on those of the acquirer. Included into the analysis were transactions values of which represented amounts in ex-

cess of 1 billion US dollars, shares of the companies were public traded.

Estimation window was a period of 100 trading days. The event window commences 10 prior to announcement of acquisition and ends 10 after the day. This course is shown in Figure 1.



**Figure 1** Estimation and event window

The subject of analysis is whether there is a difference between real returns, i.e. when the incident occurred, compared with a return that would be achieved if the incident failed to occur. Hence, return on a share is comprised of two constituents – of normal, unconditional return and of the unexpected abnormal return [4].

At analysing, the market model was used for calculating normal returns, which uses the proceeds of estimation period to estimate parameters of a simple linear regression, where stock returns are explained by yields across the entire market. For the market returns  $R_{m,t}$ , most frequently used are proxy ratios in the form of returns from stock indexes. Considered for market returns in this case was return of the Market Vectors Steel ETF (SLX). The Index provides exposure to publicly traded companies primarily involved in a variety of activities that are related to steel production, including the operation of manufacturing mills, fabrication of steel products, or the extraction and reduction of iron ore. As

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such, the Fund is subject to the risks of investing in this sector.

Abnormal return  $e_{i,t}$  has been calculated as:

$$e_{i,t} = \alpha_i + \beta_i R_{m,t} - R_{i,t}$$

Regression coefficients  $\alpha_i$  and  $\beta_i$  are estimated on the basis of the day-on-day return on the shares of individual steel companies during the estimation period.

$R_{i,t}$  presents current day-on-day return on shares of the  $i$ -th company on the  $t$ -th day,  $t = 0$  is defined as the day on which the analysed event occurred.

Based on the market model calculated can be a series of abnormal returns. Hence, for each event and day the average abnormal return will be determined as:

$$e_t^N = \frac{1}{N} \sum_{i=1}^N e_{it}$$

Where  $N$  is the number of events for the given day.

So that analysed could be the resulting abnormal returns construed has been the matrix of abnormal returns of individual companies.  $AR_{i,t}$  stands for abnormal returns of  $i$ -th company on the  $t$ -th day.

Whereas attention is paid to returns in the entire interval calculated was also cumulated return for period  $[t_1, t_2]$  marked as  $(CAR_i)$  shares  $i$ . Cumulated abnormal return on share  $i$  can be determined as:

$$CAR_i = \sum_{t=t_1}^{t=t_2} AR_{i,t}$$

Average abnormal return AAR is calculated for the period following the event day  $t = -10$  up to  $t = 10$  as the average of abnormal returns of individual steel companies in the day  $t$ :

AAR = sum of average abnormal returns /number of steel companies

Cumulative abnormal return (CAR) for day  $t$  is calculated as the sum of cumulative abnormal returns of the previous day and the average abnormal returns on the given day.

Utilised in theory are various variants of testing significance of abnormal returns. Thus, to calculate the  $t$ -statistics used can be the equation:

$$t = \frac{e_t^N}{\sigma}$$

Where  $\sigma$  is standard deviation of average abnormal returns during the estimation period and  $e_t^N$  is the average abnormal return on the  $t$ -th day.

Whether the abnormal return statistically differs from zero has been studied on the basis of  $t$ -testing. Zero hypothesis anticipates that  $\langle t = -10; t = 10 \rangle$  equals 0 during the period analysed. According to [4],  $t$ -statistics relates to the standardised value of CAR (Cumulated Abnormal Return) ratio.

This, the given fact can be entered as:

To put it in other words

H0: Notification on acquisition has neither positive nor negative impact on value of the company that effected the acquisition

H1: Notification on acquisition has either positive or negative impact on value of the company that effected the acquisition

## ANALYSIS RESULTS

Table 1 illustrates summary of values of CAR and AAR ratios of the steel companies during 21 days of the event analysed period; attained on 17 occasions were average abnormal returns higher than expected, and in four cases the average abnormal return proved to be lower than anticipated. In the entire event window, the cumulated abnormal return was positive, which means that the sum of positive average abnormal returns proved to be higher as the sum of negative values of this ratio.

Table 1 Average abnormal return, cumulative abnormal return and t stat of acquirers

Day	AAR	CAR	t stat.
-10	0,00099	0,00099	0,04208
-9	0,00823	0,00921	0,35041
-8	-0,00711	0,00210	-0,30303
-7	-0,00358	-0,00148	-0,15231
-6	0,00207	0,00060	0,08835
-5	0,00431	0,00490	0,18345
-4	0,00666	0,01156	0,28353
-3	0,00514	0,01670	0,21912
-2	0,00067	0,01738	0,02875
-1	0,01958	0,03696	0,83427
0	0,00852	0,04549	0,36315
1	0,01457	0,06006	0,62067
2	0,01256	0,07262	0,53522
3	0,01446	0,08708	0,61592
4	0,01174	0,09881	0,50000
5	0,01186	0,11067	0,50506
6	0,00038	0,11105	0,01628
7	-0,01660	0,09445	-0,70737
8	0,00391	0,09836	0,16654
9	-0,00213	0,09623	-0,09071
10	0,00545	0,10168	0,23205

Based on the development of these ratios one cannot clearly state that the announcement of the acquisition affects the values of steel companies that wanted this transaction to occur (acquirers) because the average abnormal return attains someday positive and negative values on other days.

Values of AAR and CAR of acquirers during event window are shown in Figure 2.

Based on the values it can be stated that no statistically significant change in returns on shares of acquirers occurred.

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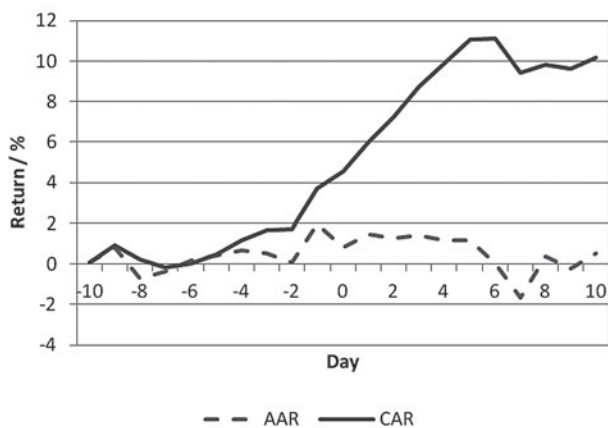


Figure 2 AAR and CAR of acquirers during event window

Table 2 and Figure 3 illustrate summary of values of CAR and AAR ratios of target companies. On 11 occasions were average abnormal returns positive, and in ten cases the average abnormal return proved to be negative. In the entire event window, the cumulated abnormal return was positive, which means that the sum of positive average abnormal returns proved to be higher as the sum of negative values of this ratio.

We are waiving zero hypotheses if the absolute value of t-statistics equals or exceed the critical value at 95 % significance level.

Table 2 Average abnormal return, cumulated abnormal return and t stat of target companies

Day	AAR	CAR	t stat
-10	0,00820	0,00820	0,25583
-9	-0,00644	0,00176	-0,20097
-8	0,01249	0,01424	0,38975
-7	-0,00235	0,01189	-0,07334
-6	0,00490	0,01679	0,15286
-5	-0,00578	0,01101	-0,18042
-4	-0,00410	0,00691	-0,12807
-3	-0,00053	0,00638	-0,01654
-2	0,00537	0,01175	0,16775
-1	0,01145	0,02320	0,35728
0	0,03270	0,05589	1,02057
1	-0,00623	0,04966	-0,19454
2	-0,00802	0,04165	-0,25019
3	0,02390	0,06555	0,74615
4	0,00246	0,06801	0,07676
5	-0,00061	0,06740	-0,01897
6	0,01025	0,07765	0,31987
7	-0,00696	0,07069	-0,21732
8	-0,00089	0,06979	-0,02790
9	0,00110	0,07090	0,03440
10	0,00487	0,07577	0,15216

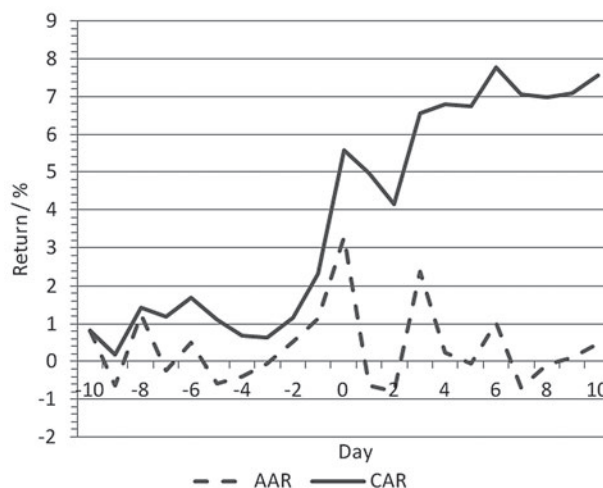


Figure 3 AAR and CAR of target companies during event window

Based on the calculated values presented in Table 2 it can be stated that, during the analysis period, not in a single day have the value exceeded the critical value, and hence the zero hypothesis cannot be waived. If the zero hypothesis is not waived, it cannot be argued that the average abnormal return will be on a day within the event window statistically significant.

## CONCLUSION

The aim of this paper was to analyse return on shares of steel companies which announced acquisition. Based on the analysis performed it can be stated that shares of the target steel companies are attaining higher returns, which does not hold for the case of acquirers.

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Note: The responsible translator for English language is Peter Skala MA, Košice, Slovakia