

REVIEW

Market Reactions to Zero or Small Positive Sales Surprise

Jiameng Ma*

School of Management, Shanghai University, Shanghai, 200444, China

ARTICLE INFO

Article history

Received: 30 June 2019

Accepted: 13 July 2019

Published Online: 26 July 2019

Keywords:

Sales surprise

Market reaction

Sales response coefficient

ABSTRACT

This paper studies how the stock market reacts to zero or small positive sales surprise. Using data from firms listed in the U.S., the paper shows that before 2003 investors react more to positive earnings surprises while after 2003 they react more to the opposite. When sales forecasts are first reported, investors believe in sales numbers and favor firms that meet or beat sales forecasts, but after 2003, investors grow skeptical, realize the possibility of sales management and trust more in negative sales surprises. One thing in common for both two samples is that Sales Response Coefficients of extreme sales surprises are smaller than those of moderate sales surprises.

1. Literature and hypotheses

Analysts play a role in firm valuation by providing performance benchmarks. Previous literature (Bartov, Givoly and Hayn (2002); Kasznik and McNicholw (2002); and Lopez and Rees (2002)^[1,2,3] has documented market premium (penalty) to meeting or beating (missing) analysts' earnings forecasts, a primary performance benchmark, after controlling for forecast error magnitude. Given the importance of meeting or beating earnings forecasts, Degeorge, Patel and Zeckhauser (1999)^[4] show that earnings falling just below the forecasts will be managed upward to meet or beat the thresholds by small margins, and Burgstahler and Eames(2006)^[5] find an unusually low(high) number of reported annual earnings fall just below (above) the analyst benchmark. And Keung, Lin and Shih (2010)^[6] take a step further and show that there exists a cost for earnings management to meet earnings forecasts and that the cost is actually for both confirmed manipulators and mere "suspects".

Obviously, the market also has access to other analyst benchmarks, such as sales forecast. Sales forecast is a market signal almost as influential as earnings one in that sales forecast is reported together with earnings forecast and it is of the public and media interest whether a firm meets or misses sales forecasts. For example, CNNMoney writes about Apple performance predictions as "The consensus among the pros -- earnings of \$13.45 on sales of \$54.74 billion -- represents growth of 4% and 27%, respectively. The median estimate among all 65 analysts is for earnings of \$14.20 on sales of \$55.96 billion, up 10% and 30%, respectively" (Handicapping Apple's quarterly earnings and sales: Q1 2013, CNNMoney, January 15, 2013: 4:05 PM ET). In addition, CNNMoney reports "IBM released third-quarter results Wednesday that missed sales forecasts by over \$1 billion, as the company's hardware business took a hit from the transition to the cloud" (IBM misses sales forecasts, CNNMoney, October 16, 2013: 5:22 PM ET). Similar to earnings forecast error studies, Rees and Sivaramakrishnan (2007)^[7] find a significant association between sales

*Corresponding Author:

Jiameng Ma,

School of Management, Shanghai University, 99 Shangda Road, Shanghai, 200444, China;

E-mail: majiameng8918@163.com

forecast errors and abnormal returns around the earnings announcement date and show that the market premium (penalty) to meeting or beating (missing) earnings forecasts is accentuated when sales forecasts are also met (missed) and that no evidence of an equity premium or penalty when the earnings and sales signals conflict.

Now that sales forecast is attached great importance to by the market and there is also negative market reaction of missing sales forecast, I propose the following two hypotheses:

Hypothesis I: Firms manage sales to meet analyst sales forecasts.

Hypothesis II: There is cost for sales management to meet analyst sales forecasts.

2. Sample

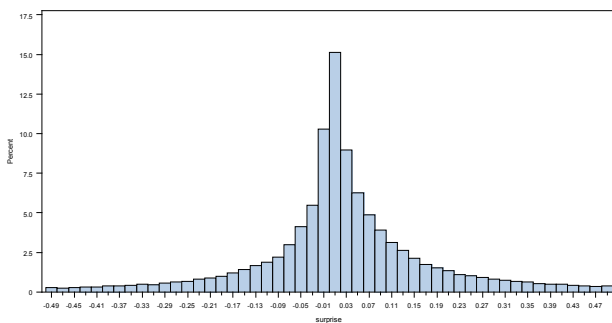


Figure 1. Frequency distribution of sales surprise per share in 2-cent bins in a range from -50 cents to 50 cents using quarterly observations in 1999-2006.

For this study, I obtain actual sales, consensus sales forecasts, actual earnings and consensus earnings forecasts from I/B/E/S, and stock and market return data and share price data from Center for Research in Security Prices (CRSP). Following Burgstahler and Dichev (1997)^[5], Brown and Caylor (2005)^[8] and Keung, Lin and Shih (2010)^[6], I delete from my sample firms with SIC codes 4400-5500 (regulated industry) and 6000-6500 (financial institutions). In addition, I delete firm-quarters with sales surprises in the top and bottom 1% to avoid potential outliers. The final sample consists of 58,063 firm-quarters from 1999 to 2006. The period 1999-2006 is chosen to make results of this study comparable with those of Keung, Lin and Shih (2010)^[6], whose sample period covers 1992 to 2006. Keung, Lin and Shih (2010)^[6] document a cost for earnings management to meet earnings forecasts, which is the most relevant literature to my study of whether there is a cost for sales management to meet sales forecasts. The sample starts from 1999 because there is no sales forecast until 1996 and 1999 is the first year that sees significantly large number of sales forecasts.

To examine whether firms also manage sales to meet analyst sales forecasts, I follow previous literature (Beaver, McNichols, and Nelson, 2007)^[9], Dechow, Richardson, and Tuna (2003)^[10], Degeorge, Patell, and Zeckhauser (1999)^[4], and Burgstahler and Dichev (1997)^[5] and test whether there is a distribution discontinuity at zero. Figure 1 plots the frequency distribution of sales surprise per share, SS (calculated as actual sales per share minus the latest consensus analyst sales forecast and scaled by number of shares outstanding) in 2-cent bins in a range from -50 cents to 50 cents using quarterly observations over the whole sample period. The distribution is basically symmetric, but there are significantly less SS in the 2-cent bin just to the left of zero compared with the 2-cent bin just to the right of zero (t-statistic=3.36). Consistent with prior finding that meet or beat sales forecast is an important threshold for managers, the significant discontinuity at zero supports Hypothesis I that firms manage sales to meet analyst sales forecasts. And the significant SS percentage difference in the 2-cent bins around zero shows that like earnings management firms manage sales also by a small margin.

Based on the finding that firms prefer to meet or beat sales forecasts by a small margin rather than a large margin, I investigate the trend of sales management over the sample period. Following Keung, Lin and Shih (2010)^[6], I measure the trend by calculating the sales manipulation index for each year from 1999 to 2006. Sales manipulation index, SMI, is defined as the number of SS in $[0 \text{ ¢}, 2 \text{ ¢}]$ (“just make it”) divided by the number in $[-2 \text{ ¢}, 0 \text{ ¢}]$ (“just miss it”) each year. Figure 2 illustrates SMI for each year in the whole sample period. An SMI always larger than one means that there are always more SSs in “just make it” range than in “just miss it” range, confirming findings in Figure 1 that firms manage sales to meet analyst sales forecasts and do so by small margin. SMI of magnitude less than 2, however, is much smaller than earnings manipulation index documented in Figure 1 by Keung, Lin and Shih (2010) whose magnitude averages 3.6 $((2.68+4.19+3.92)/3)$ in the whole sample period. This shows that although sales manipulation exists, it is far less pervasive than earnings manipulation.

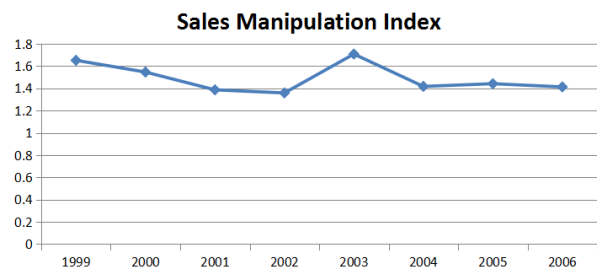


Figure 2. Annual ratio of number of sales surprise per share in the range $[0 \text{ ¢}, 2 \text{ ¢}]$ to number of sales surprise per share in the range $[-2 \text{ ¢}, 0 \text{ ¢}]$ in 1999-2006.

When sales forecast is first widely reported in 1999, SMI is on a relatively high level of around 1.7. Then it sees a steady decline of around 20% $((1.4-1.7)/1.7)$ since 2000 and stables at around 1.4 ever since except that in 2003 it hits the record high of about 1.7 and falls to 1.4 again in the next year. This trend is basically consistent with that of earnings manipulation index suggested by Figure 1 (Keung, Lin and Shih (2010)) where earnings manipulation index also sees a steady decline from 1999 to 2006. The only difference lies in the time of sudden increase: 2003 for SMI and 2002 for earnings manipulation index.

Following Keung, Lin and Shih (2010), I partition the whole sample periods into two equal-length periods: 1999-2002 and 2003-2006. Through investigating market reactions to sales surprise before and after 2003 when there is a sudden increase and decrease in SMI, I offer explanation to SMI trend of periods 1999-2002 and 2003-2006.

3. Methodology and results

To examine whether there is cost for sales management to meet analyst sales forecasts, I analyze market reactions to a zero or small positive sales surprise. Following the idea of Earnings Response Coefficient, ERC, I calculate Sales Response Coefficient, SRC, to proxy for market response to sales surprise. If there is cost for sales management, investors are less likely to believe in the informativeness of reported sales number and thus stock price is less likely to react to sales surprise. Given that, SRC will be smaller for zero or small positive sales surprises.

Similar to previous literature (Easton and Zmijewski (1989) ^[11], DeFond and Park (2001) ^[12], Bartov, Givoly, and Hayn (2002) ^[1], Brown and Caylor (2005) ^[8], and Keung, Lin and Shih (2010) ^[6]), I estimate SRC by regressing abnormal returns on sales surprise per share scaled by stock price. Since actual earnings numbers are announced at the same day as actual sales numbers, and prior studies suggest significant market response to earnings surprise, I also control for earnings surprise scaled by stock price:

$$CAR = \alpha + \beta \left(\frac{SS}{P}\right) + \gamma \left(\frac{ES}{P}\right) + \dots + \varepsilon,$$

where CAR is cumulative abnormal returns at the sales announcement, SS is sales surprise per share calculated as actual sales per share minus the latest consensus analyst sales forecast and divided by number of shares outstanding, ES is earnings surprise, calculated as actual earnings per share minus the latest consensus analyst earnings forecast, and P is share price. The coefficient β in the regres-

sion is the SRC and γ is the ERC.

Following Keung, Lin and Shih (2010), my CAR period contains three days starting one day before the sales announcement date and ending one day after. To investigate whether SRC is smaller for zero or small positive sales surprises, I partition SS for all firm-quarters into 6 ranges and estimate the SRC for each range separately. Range S_{-4} includes SS's less than $-8 \text{ } \mathcal{C}$, S_{-3} includes SS's in $[-8 \text{ } \mathcal{C}, -4 \text{ } \mathcal{C})$, S_{-2} includes SS's in $[-4 \text{ } \mathcal{C}, -2 \text{ } \mathcal{C})$, S_{-1} includes SS's in $[-2 \text{ } \mathcal{C}, 0 \text{ } \mathcal{C})$, S_0 includes SS's in $[0 \text{ } \mathcal{C}, 2 \text{ } \mathcal{C}]$, S_1 includes SS's in $(2 \text{ } \mathcal{C}, 4 \text{ } \mathcal{C}]$, S_2 includes SS's in $(4 \text{ } \mathcal{C}, 8 \text{ } \mathcal{C}]$, S_3 includes SS's greater than $8 \text{ } \mathcal{C}$. I also control for earnings surprise partitioned into 14 ranges as Keung, Lin and Shih (2010) do and estimate the ERC for each range separately. Range E_{-7} includes ES's less than $-8 \text{ } \mathcal{C}$, E_{-6} includes ES's in the range $[-8 \text{ } \mathcal{C}, -6 \text{ } \mathcal{C})$, E_{-5} includes ES's in $[-6 \text{ } \mathcal{C}, -4 \text{ } \mathcal{C})$, E_{-4} includes ES's in $[-4 \text{ } \mathcal{C}, -3 \text{ } \mathcal{C})$, E_{-3} includes ES's in $[-3 \text{ } \mathcal{C}, -2 \text{ } \mathcal{C})$, E_{-2} includes ES's in $[-2 \text{ } \mathcal{C}, -1 \text{ } \mathcal{C})$, E_{-1} includes ES's in $[-1 \text{ } \mathcal{C}, 0 \text{ } \mathcal{C})$, E_0 includes ES's in $[0 \text{ } \mathcal{C}, 1 \text{ } \mathcal{C})$, E_1 includes ES's in $(1 \text{ } \mathcal{C}, 2 \text{ } \mathcal{C}]$, E_2 includes ES's in $(2 \text{ } \mathcal{C}, 3 \text{ } \mathcal{C}]$, E_3 includes ES's in $(3 \text{ } \mathcal{C}, 4 \text{ } \mathcal{C}]$, E_4 includes ES's in $(4 \text{ } \mathcal{C}, 6 \text{ } \mathcal{C}]$, E_5 includes ES's in $(6 \text{ } \mathcal{C}, 8 \text{ } \mathcal{C}]$, and E_6 includes ES's greater than $8 \text{ } \mathcal{C}$.

Following Keung, Lin and Shih (2010), my regression model is as below:

$$CAR[-1, 1] = \alpha + \beta \times CAR[-20, -2] + \sum_{k=-4}^3 \left(\gamma_k \times DS_k \times \frac{SS}{P} \right) + \sum_{k=-7}^6 \left(\delta_k \times DE_k \times \frac{ES}{P} \right) + \varepsilon$$

where

$CAR^{[-1, 1]}$: cumulative abnormal returns from one day before to one day after the earnings announcement;

$CAR^{[-20, -2]}$: cumulative abnormal returns from 20 days before to 2 days before the earnings announcement;

SS/P: sales surprise (SS) scaled by share price 21 days before the earnings announcement date (P);

ES/P: earnings surprise (ES) scaled by share price 21 days before the earnings announcement date (P);

DS_k : sales surprise dummy, equal to 1 if SS falls in Range S_k and 0 otherwise; and

DE_k : earnings surprise dummy, equal to 1 if ES falls in Range E_k and 0 otherwise.

I estimate cumulative abnormal returns as follows:

$$CAR_j[-1, 1] = \sum_{t=-1}^1 AR_{jt}$$

$$CAR_j[-20, -2] = \sum_{t=-20}^{-2} AR_{jt}$$

where AR_{jt} is daily abnormal returns estimated using estimates of the coefficients of the market model over the 255-day period ending 41 days before the earnings announcement, R_{jt} is the return for firm j on day t , and R_{mt} is the equally weighted market return on day t :

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt}$$

$$AR_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt})$$

Table 1. Variation of the SRC and ERC across SS Ranges and ES Ranges respectively

$$CAR[-1, 1] = \alpha + \beta \times CAR[-2, 0] + \sum_{k=-4}^3 \left(\gamma_k \times DS_k \times \frac{SS}{P} \right) + \sum_{k=-7}^6 \left(\delta_k \times DE_k \times \frac{ES}{P} \right) + \varepsilon$$

variables	1999-2002		2003-2006	
	Coef.	t-stat.	Coef.	t-stat.
Intercept	0.00	-2.87***	0.00	-2.8***
CAR[-20, -2]	0.01	2**	-0.02	-4.66***
SS/P for SS in				
(<-8%)	0.01	2.22**	0.05	7.77***
[-8%, -4%)	-0.17	-1.62	1.02	7.34***
[-4%, -2%)	0.45	1.3	1.08	4.13***
[-2%, 0%)	-0.34	-0.65	5.24	8.78***
[0%, 2%)	0.84	1.46	-2.61	-4.11***
(2%, 4%)	1.46	3.73***	0.08	0.22
(4%, 8%)	0.43	2.27**	0.55	3.83***
(>8%)	0.05	4.95	0.04	5.35***
ES/P for ES in				
(<-8%)	0.01	2.84***	0.00	0.36
[-8%, -6%)	0.50	2.98***	1.82	7.81***
[-6%, -4%)	0.50	2.03**	0.81	3.5***
[-4%, -3%)	0.25	0.64	-0.82	-3.14***
[-3%, -2%)	1.10	1.97*	2.33	5.36***
[-2%, -1%)	4.08	3.61***	2.10	2.92***
[-1%, 0%)	-2.33	-1	0.73	0.92
[0%, 1%)	3.05	3.28***	6.28	6.24***
(1%, 2%)	1.43	2.63***	3.78	5.99***
(2%, 3%)	0.89	2.38**	4.04	8.95***
(3%, 4%)	1.21	2.73***	-0.02	-0.04
(4%, 6%)	0.57	2.63***	2.47	10.2***
(6%, 8%)	0.61	3.33***	2.75	11.53***
(>8%)	0.00	0.16	0.00	-0.74
Adj. R-sq	0.01		0.02	

I estimate the regression model with data pooled across firm-quarters. Table 1 and Figure 3 report results for firm-quarters in the periods 1999-2002 and 2003-2006 separately. There is a distinct difference between 1999-2002 sample and 2003-2006 sample. As shown in Panel A of Figure 3, for the 1999-2002 sample SRCs of all the positive sales surprise ranges are larger than zero while as shown in Panel B of Figure 3, for the 2003-2006 sample SRCs of all the negative sales surprise ranges are larger than zero. This suggests that before 2003 investors react more to positive earnings surprises while after 2003 they react more to the opposite. When sales forecasts are first reported, investors believe in sales numbers and favor firms that meet or beat sales forecasts, but after 2003, investors grow skeptical, real-

ize the possibility of sales management and trust more in negative sales surprises. But one thing in common for both two samples is that SRCs of extreme sales surprises are smaller than those of moderate sales surprises, confirming the finding in Keung, Lin and Shih (2010) that moderate sales surprises are considered to be more sustainable.

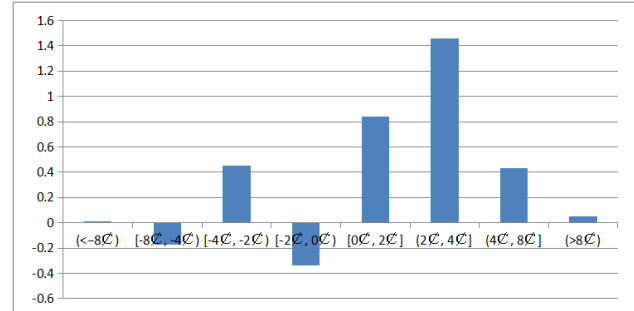


Figure 3. Variation in SRC across sales surprise ranges Panel A: 1999-2002 Sample

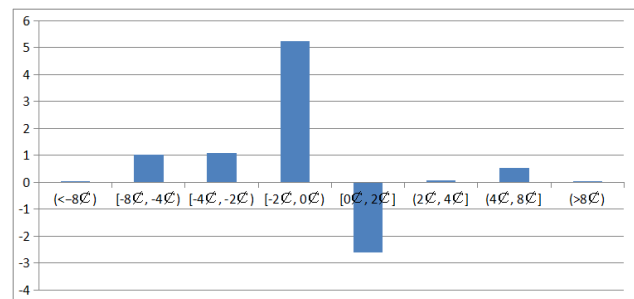


Figure 3. Variation in SRC across sales surprise ranges Panel B: 2003-2006 Sample

There is another interesting anomaly. In 1999-2002 sample, SRC of [-2%, 0%) is the smallest of the whole sample while SRC of [0%, 2%) is one of the largest. Therefore, an increase of Sales Manipulation Index in 2003 may be due to the big reward for “just make it” and big penalty for “just miss it”. But it is a totally different story in 2003-2006 sample. SRC of [-2%, 0%) is the largest of the whole sample while SRC of [0%, 2%) is the only (significantly) negative and the smallest one. This change is a signal of investor skepticism toward zero and small positive sales surprises and gives explanation to the drop of Sales Manipulation Index after 2003.

To sum up, regression results support hypothesis II and document costs for sales management to meet analyst sales forecasts after 2003.

To test the robustness of the result, I also change the size of sales surprise ranges and run the same regression again. Table 2 and Figure 4 report the results which also supports hypothesis II.

Table 2. Variation of the SRC and ERC across SS Ranges and ES Ranges respectively

$$CAR[-1, 1] = \alpha + \beta \times CAR[-2.0, -2] + \sum_{k=-3}^2 (\gamma_k \times DS_k \times \frac{SS}{P}) + \sum_{k=-7}^6 (\delta_k \times DE_k \times \frac{ES}{P}) + \varepsilon$$

variables	1999-2002		2003-2006	
	Coef.	t-stat.	Coef.	t-stat.
Intercept	-0.00257	-2.82***	0.00	-2.99***
CAR[-20, -2]	0.00863	1.99**	-0.02	-4.61***
SS/P for SS in				
(<-8%)	0.00982	2.3**	0.05	7.68***
[-8%, -3%)	-0.14019	-1.37	0.99	7.62***
[-3%, 0%)	0.09788	0.26	2.21	6.38***
[0%, 3%)	0.82332	1.84*	-1.21	-2.85***
[3%, 8%)	0.60281	3.42***	0.59	4.26***
(>8%)	0.04993	4.87***	0.04	5.49***
ES/P for ES in				
(<-8%)	0.00453	2.51**	0.00	0.42
[-8%, -6%)	0.50237	2.98***	1.89	8.11***
[-6%, -4%)	0.52328	2.11**	0.92	3.98***
[-4%, -3%)	0.21522	0.54	-0.75	-2.92***
[-3%, -2%)	0.93853	1.69*	2.74	6.37***
[-2%, -1%)	4.39017	3.92***	2.47	3.43***
[-1%, 0%)	-2.29935	-0.98	1.30	1.65*
[0%, 1%)	3.3459	3.8***	5.66	5.64***
[1%, 2%)	1.53061	2.84***	3.38	5.37***
[2%, 3%)	0.90639	2.43**	3.78	8.46***
[3%, 4%)	1.23086	2.78***	-0.26	-0.65
[4%, 6%)	0.52692	2.45**	2.39	9.88***
[6%, 8%)	0.59578	3.25***	2.69	11.27***
(>8%)	0.00142	0.26	0.00	-0.74
Adj. R-sq	0.01		0.02	

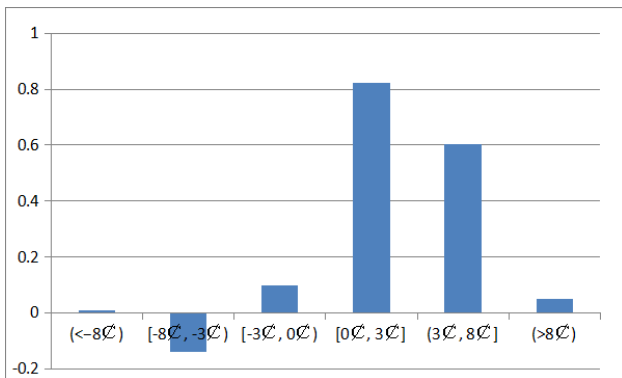


Figure 4. Variation in SRC across sales surprise ranges Panel A: 1999-2002 Sample

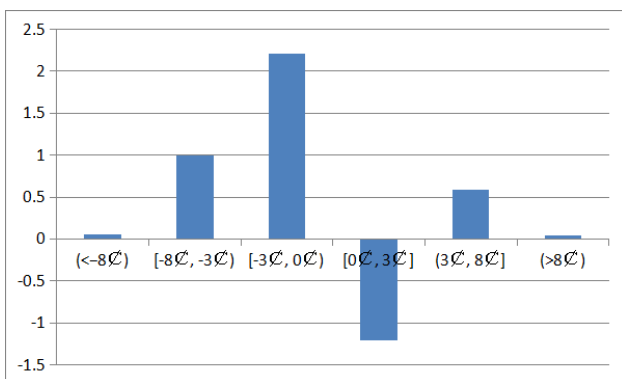


Figure 4. Variation in SRC across sales surprise ranges Panel B: 2003-2006 Sample

References

- [1] Bartov, E., D. Givoly, and C. Hayn. The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics*, 2002, 33 (2): 173–204.
- [2] Kasznik, R., and M. McNichols. Does meeting earnings expectations matter? Evidence from analyst forecast revisions and share prices. *Journal of Accounting Research*, 2002, 40 (3): 727–59.
- [3] Lopez, T., and L. Rees. The effect of beating and missing analysts’ forecasts on the information content of unexpected earnings. *Journal of Accounting, Auditing and Finance*, 2002, 17 (2): 155–84.
- [4] Degorge, F., J. Patel, R. Zeckhauser. Earnings Management to Exceed Thresholds. *Journal of Business*, 1999, 72: 1–33.
- [5] Burgstahler, D., I. Dichev. Earnings Management to Avoid Earnings Decreases and Losses. *Journal of Accounting & Economics*, 1997, 24: 99–126.
- [6] Keung, E., Z. Lin, M. Shih. “Does the Stock Market See a Zero or Small Positive Earnings Surprise as a Red Flag?” *Journal of Accounting Research*, 2010, 48: 91–121.
- [7] Rees, L. K. Sivaramakrishnan. The effect of meeting or beating revenue forecasts on the association between quarterly returns and earnings forecast errors. *Contemporary Accounting Research*, 2007, 24 (1): 259-90.
- [8] Brown, L., M. Caylor. A Temporal Analysis of Quarterly Earnings Threshold: Propensity and Valuation Consequences. *The Accounting Review*, 2005, 80: 423–40.
- [9] Beaver, W., McNichols, M., Nelson, K.. An alternative interpretation of the discontinuity in earnings distributions. *Review of Accounting Studies*, 2007, 12, 525–556.
- [10] Dechow, P.M., Richardson, S.A., Tuna, I.. Why are earnings kinky? *Review of Accounting Studies*, 2003, 8, 355–384.
- [11] Easton, P., M. W. Zmijewski. Cross-Sectional Variation in the Stock Market Responses to the Announcement of Accounting Earnings. *Journal of Accounting and Economics*, 1989, 11: 117–41.
- [12] Defond, M. L., C.W. Park. The Reversal of Abnormal Accruals and the Market Valuation of Earnings Surprises. *The Accounting Review*, 2001, 76: 375–404.
- [13] Burgstahler, D., M. Eames. Management of Earnings and Analysts’ Forecasts to Achieve Zero and Small Positive Earnings Surprises. *Journal of Business Finance & Accounting*, 2006, 33: 633–52.