



10.2478/v10103-011-0023-1

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## **Earnings Management in Polish Companies**

### **Abstract**

*This paper presents results of the investigation of a phenomenon known as „earnings management” (EM) among the companies listed on the Polish stock market. The distribution of earnings per share (EPS) for the stocks around the threshold value of “zero” and the threshold of “recent performance” was analyzed in the period of years 1997-2010. Moreover, the changes of earnings for the stocks, which are suspected to manipulate their earnings, were also investigated. The results, which indicate asymmetric distribution of earnings around the zero threshold along with the relative deterioration of earnings in the year following the period when the companies were suspected to conduct earnings management practices, provide evidence that this phenomenon exists among Polish stock market companies.*

### **1. Introduction**

Earnings are one of the most important items of financial reports issued by public companies. Profits of every firm are closely scrutinized by shareholders, investors, financial analysts or boards of directors in order to determine the attractiveness of a particular stock or to reward the executives

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for their work and for their financial results. This is the reason why the management of a company sometimes decides to deliberately manipulate the firm's earnings, so that the pre-determined targets can be achieved. Such strategy is often called "earnings management" (EM). Healy and Wahlen (1999) state that: "*Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes*". It must be emphasized, however, that earnings management, as we understand it for the purpose of this study, should not be confused with illegal activities, such as financial fraud, which is at the illegal end of continuum of activities of this type, whereas earnings management is at the legal end.

Earnings management may be executed by two kinds of management actions:

- accounting choices which follow legally accepted rules,
- operating decisions.

An example of an accounting choice is adopting the depreciable life for new plant at the high end of industry norms (in order to lower depreciation expenses) or at the level lower than the high end of industry norms.

An example of operating decision is a delay in the execution of normal maintenance procedures in one period in order to reduce maintenance costs in that period and to perform this procedure in the following period.

This kind of earnings management practices may lead to real economic costs, if the company incurs higher operating costs caused by the lack of maintenance in the future period. However, a company may pay real economic costs also *via* accounting choices. For example, it may pay a higher bonus in the subsequent period due to accounting earnings management (Ziv, 1998).

One of the most frequently mentioned targets of earnings management is the, so called, smoothing. Smoothing has existed over decades and there are two general views as to what motivates managers to smooth earnings (Aflatooni and Nikbaht, 2010). According to the first view, smoothing is an efficient vehicle for managers to reveal private information (Ronen and Sadan, 1981, Demski, 1998, Sankar and Subramanyam, 2001, Srinidhi, Ronen and Maindiratta, 2001, Kirshenheiter and Melumad, 2002, and Goel and Thakor, 2003, among others). In such case, it may play a similar role as dividend smoothing (see, for example, Miller and Rock, 1985). The second view of smoothing is the, so called, garbling, according to which smoothing is an action undertaken by managers in attempt to fool financial analysts and the shareholders and to enhance managerial compensation (Beidleman, 1973, Lambert, 1984, Arya, Glover and Sunder, 1998, and Demski and Frimor, 1999, among others).

However, smoothing is not the only possible explanation for the motives behind earnings management. Since accounting numbers have no meaning unless they are compared to some benchmarks, companies have incentive to beat such benchmark as, for example, zero earnings, earnings in the corresponding periods in the past (for example quarter-to-quarter results) or analysts' consensus forecasts (see Ronen and Yaari, 2008, Aflatooni and Nikbaht, 2010, among others). There exists evidence in the literature about earnings management aiming to exceed certain thresholds in form of a discontinuity in frequency of firms' earnings around zero or some other threshold levels (Hayn, 1995, Burgstahler and Dichev, 1997, Degeorge, Patel and Zeckhauser, 2005).

This paper deals with the latter effect, i.e. with earnings management thresholds. Most studies focused on that problem concern economies of developed countries, but the evidence from emerging markets is limited (see, for instance, Wójtowicz, 2010). The aim of our paper is to find out whether earnings management effects exist among Polish companies and whether they are similar in nature to this phenomenon in other, developed markets.

The paper is organized as follows: section 2 presents methodology of this study, section 3 describes data sample, section 4 offers discussion of empirical results and section 5 concludes.

## 2. Methodology

According to common opinions, executives care about some threshold levels when they report earnings. Two of them are the main subject of analysis in our study, i.e.:

- the objective to report the profit above zero,
- the objective to achieve at least the last period's profit (i.e. not to worsen recent performance).

Our study follows the methodology of Degeorge, Patel and Zeckhauser (2005) based on the idea that execution of earnings management practices in order to reach or beat certain thresholds affects the distribution of net profits, when analyzed in a large group of companies, and can be explained on the basis of a 2-period model. In each period ( $t=1,2$ ) the firm gets the random, independent and identically distributed draw of "true earnings" ( $T_1$  and  $T_2$ ). The "true earnings" can not be observed by outsiders who see only the reported earnings ( $R_1$  and  $R_2$ ). In period  $t=1$  the executives can "manage" reported earnings by choosing an amount ( $M_1$ ) that is added to earnings such that:

$$R_1 = T_1 + M_1. \quad (1)$$

The cost of “earnings management” is paid later in period  $t=2$ , so that:

$$R_2 = T_2 - K(M_1) \quad (2)$$

where  $K(M_1)$  is the positive and increasing marginal costs of moving  $M_1$  away from 0 and  $K(0) = 0$ .

In this analysis we adopt a simplifying assumption that the discount rate is equal to 0. The general meaning of equations (1) and (2) is that earnings management in period  $t=1$  towards increasing the net profit by 1 PLN reduces net profit in period  $t=2$  by more than 1 PLN (in our model  $M_1$  may be also negative; in such case the reduction in profit by 1 PLN in period  $t=1$  would be followed by earnings increase in period  $t=2$  by less than 1 PLN).

We also assume that the company ceases to exist after period  $t=2$  and every relevant information is revealed at this time.

It is important to note that manipulation of earnings does not necessarily have to occur at any profit level. In fact, managers care only about particular values (which we call thresholds), because everyone concerned with the firm’s performance behaves the same way. In our study, we focus on two important thresholds, i.e.:

- positive profit,
- recent performance.

Thresholds are important for several various reasons (Degeorge, Patel and Zeckhauser, 2003). Some of them are psychological in nature. First, a perception of positive and non-positive value in human mind is fundamentally different. As a result, there exists a solid division line between achieving and failing to achieve the value of earnings equal to zero. Second, earnings management across thresholds is relevant for the simplification of managers relation with shareholders and board of directors: the rewards for firms’ managers – both employment decisions and compensation benefits – often depend implicitly or explicitly on the earnings for which executives are responsible and which they generate (Healy, 1985). Moreover, banks may sometimes have the policies to grant loans only to firms that report positive earnings, which also increases the role and importance of positive earnings threshold.

A certain pattern of earnings over time conveys key information to the markets about company’s financial situation and its stability. For example, a report showing that earnings have been increasing during the last 7 years is a cheap and simple way of communicating that the performance of the company is systematically good.

Threshold effects may be meaningful even if only few participants react to them directly. For example, even if only banks care about thresholds, reaching

certain level of earnings will have a positive effect also for other market participants.

Our analysis is divided into the following 3 stages:

1. First, we investigate the distribution of earnings around selected thresholds, i.e. around the  $EPS = 0$  (i.e. the positive profit threshold) and the EPS growth equal to zero (i.e. the positive earnings growth threshold),
2. Second, we check whether there is a discontinuity in the EPS around the thresholds. We apply the test of discontinuity in a univariate distribution proposed by Degeorge, Patel and Zeckhauser (2005) using the statistic  $\tau$ . We examine the rank of  $\tau$  at the threshold relative to the other  $\tau$ 's as well as its relative magnitude in order to assess whether discontinuity can be found at the analyzed threshold level.
3. Third, we control whether according to equations (1) and (2) earnings management causes predictable changes in the earnings in the next period. This way we can find out whether the companies suspected to practice EM towards the increase of earnings, experience the decrease of their earnings in the following year.

In the next sections we describe the database used in this study and present empirical results.

### 3. Data sample

The dataset used in this investigation consists of detailed information from income statements from 359 companies listed on the Warsaw Stock Exchange (WSE) in the period of years: 2000-2009. We selected two thresholds, i.e. positive profit and recent performance on the basis of annual and quarterly reports.

The number of quarterly reports available was 7939 and the number of annual reports was 2726.

The source of all data is "Notoria" database.

### 4. Empirical results

Our analysis aims to explore the extent to which executives can manage earnings to attain two threshold levels described above. We study the density function for earnings near those thresholds. If managers do indeed manage

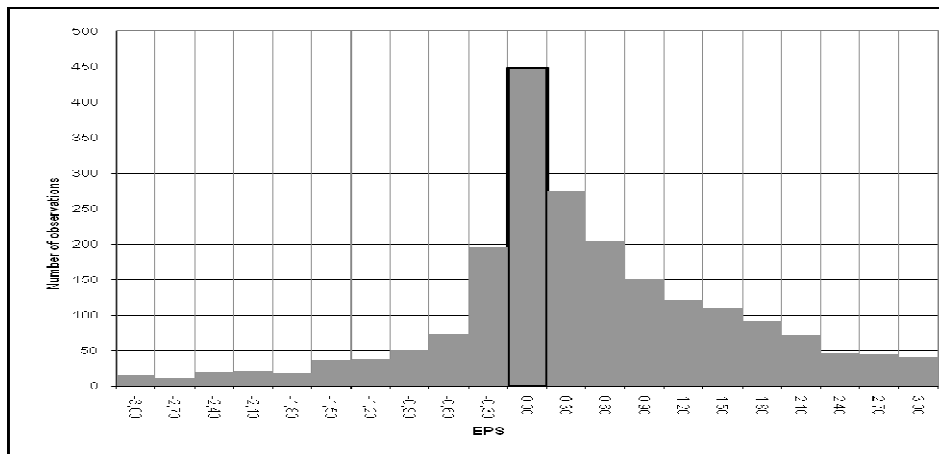
earnings to reach certain level of them, we should expect to observe “too few” earnings reports directly below it and “too many” at or directly above it. We should also expect a discontinuity in density at the level of investigated thresholds.

#### **4.1. Positive profit threshold**

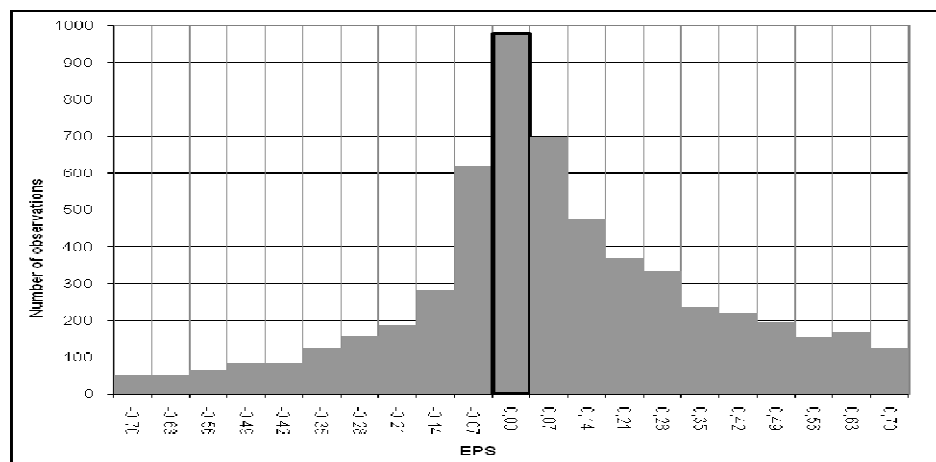
The first threshold which we consider is probably the most natural one, i.e. the positive earnings. The analysis of this particular threshold level addresses the most important question for shareholders, namely whether the company is profitable at all.

Figure 1 presents the histogram of EPS for the threshold “positive/zero profits” for annual earnings. The distribution shows a considerable jump between the value of -0,30 and zero, which indicates that the managers strongly desire to be able to report positive earnings. The value of  $\tau$ -statistic (based on the basic test for discontinuity) confirms this pattern. At  $EPS = 0$  we obtain a  $\tau$  value of 9,8, which is the highest in the sample and confirms discontinuity at that point.

Figure 2 presents the same distribution but for quarterly EPS. The findings for this frequency of data are very similar to the results from annual data. In this case, the distribution also shows a considerable jump between the value of -0,07 and zero, so it appears that managers strongly desire to be able to report positive earnings. The value of a  $\tau$ -statistic (based on the same test as before) at  $EPS = 0$  is equal to 9,5. This, again, confirms a discontinuity at that point.

**Figure 1. Histogram of annual EPS for the threshold “positive/zero profits”**

Source: Own calculations.

**Figure 2. Histogram of quarterly EPS for the threshold “positive/zero profits”**

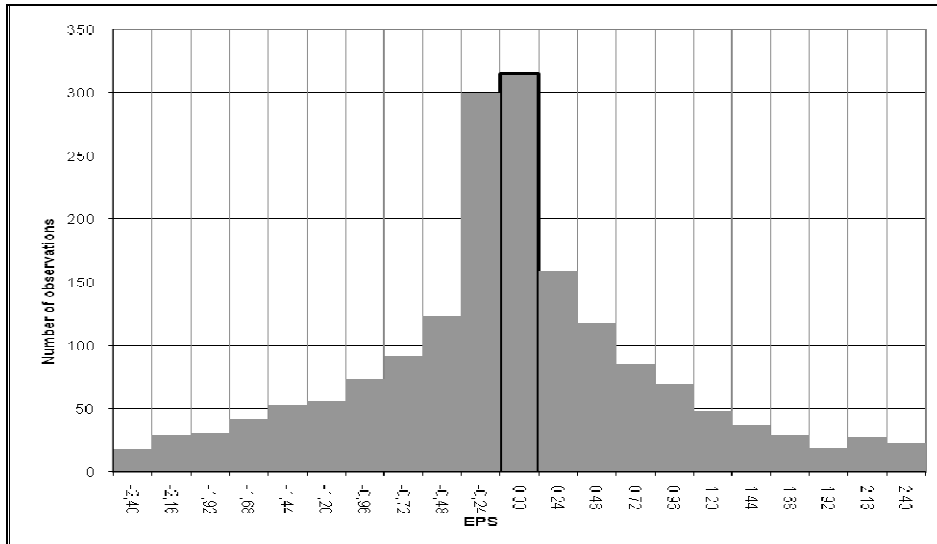
Source: Own calculations.

Summarizing, our results presented in this section provide evidence that the zero value net profit may be treated as a threshold for earnings management among the Polish companies listed at the WSE.

#### 4.2. Positive profit growth threshold

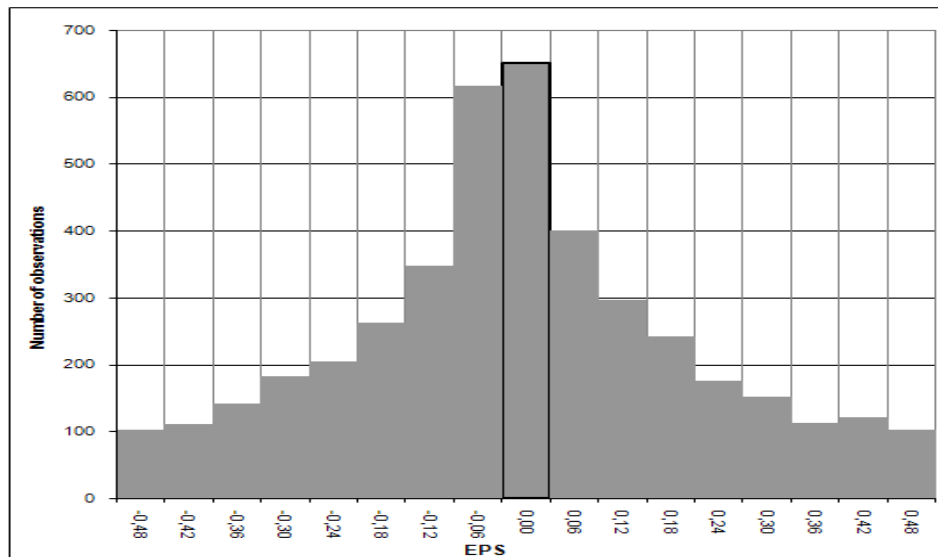
We now turn to the analysis of the positive growth threshold. Figure 3 presents results for annual EPS growth. The change in earnings, denoted as  $\Delta\text{EPS}_A$ , is defined as annual EPS minus annual EPS from four quarters ago. In Figure 3 we can observe a jump in distribution at 0, however it is not as strong as in the case of the previously analyzed EPS threshold. It is worth mentioning, that in that case the jump is stronger at the level value of -0,24. This pattern of  $\Delta\text{EPS}_A$  distribution is, therefore, not so strongly consistent with the view that executives manage earnings in order to achieve or beat the comparable figures relative to the results from four quarters ago ( $\tau$ -test value is equal to 4,5).

**Figure 3. Histogram of change in annual EPS for the threshold of “positive growth”**



Source: Own calculations.



**Figure 4. Histogram of change in quarterly EPS for the threshold of “positive growth”**

Source: Own calculations.

Figure 4 presents distribution of quarterly EPS growth. The change in earnings, denoted as  $\Delta EPS_Q$ , is defined as quarterly EPS minus quarterly EPS from four quarters ago. Figure 4 also exhibits a jump in the distribution at 0. However also in that case we can observe that a jump in distribution at 0 is not as high as in the case of the previously analyzed EPS threshold. This pattern of  $\Delta EPS_Q$  distribution is, therefore, not so strongly consistent with the view that executives manage earnings in order to achieve or beat the quarterly earnings from a year ago. Nevertheless, the largest number of companies in the interval (0; 0,06); i.e directly above zero, may partly confirm that at least some managers treat the  $\Delta EPS$  as a threshold.

In summary, the results presented above may be considered as evidence that positive profit is the earnings management threshold for Polish companies, whereas the positive profit growth seems to be the threshold that is much less visible. Similar evidence for the Polish market presents Wójtowicz (2010).

It is worthwhile to note that our results partly support the findings of Degeorge, Patel and Zeckhauser (2005) for the US market, according to which both the positive profit and the positive profit growth thresholds drive the EM practices, however the thresholds are hierarchically ordered and the most important objective of executives seems to be to generate positive profits whereas the aim to achieve the results at least equal to those from four quarters

ago is of secondary importance. Our study, hence, provides evidence that the behavior of Polish and American managers is similar in that respect.

### 4.3. The consequences of earnings management for future earnings

According to the model analyzed in equations (1) and (2), earnings management aiming to achieve thresholds in one period will affect next period's earnings. Thus, we now investigate whether following the period with likely EM, the earnings are changing according to any predictable pattern.

As in DeGeorge, Patel and Zeckhouser (2005) we examine the performance of the firms suspected to practice EM, i.e. those that just achieved the thresholds relative to the performance of firms which just missed the thresholds or easily surpassed them. We divide firms accordingly into five groups: A, B, C, D and E, depending on their earnings. Each group has a range defined as in Silverman (1986) and Scott (1992), which is related to the variability of the data and (negatively) related to the number of observations:

$$k = 2 \cdot RK \cdot n^{-1/3} \quad (3)$$

where  $RK$  is the sample interquartile range of the variable and  $n$  is the number of observations.

Therefore, we distinguish the following groups:

- Group A consisting of firms, which failed to meet the thresholds, i.e.:  $EPS < -k$ ,
- Group B consisting of firms, which just failed to meet the thresholds, i.e.:  $-k \leq EPS < 0$ ,
- Group C consisting of firms, which just met or exceeded the thresholds, i.e.:  $0 \leq EPS < k$ .
- Group D consisting of firms, which beat the thresholds easily, i.e.:  $k \leq EPS < 2k$ ,
- Group E consisting of firms which strongly surpassed the thresholds, i.e.:  $EPS \geq 2k$ .

Group C is likely to include a number of firms which by executing earnings management have increased their earnings in order to reach the thresholds. The number of such firms in Group D should be, presumably, lower.

We denote the average performance of every group by a corresponding lower-case letter and indicate the period by a subscript 1 or 2. By assumption, the following relation should hold:

$$e_1 > d_1 > c_1 > b_1 > a_1. \quad (4)$$

Normally, we would expect some persistence in both the EPS level and in the change of earnings. Thus, in case EM does not exist, we would expect the following:  $d_2 > c_2 > b_2$ . The question is how might earnings management affect these inequalities? Earnings recorded by companies in group C are suspected of upward manipulation. Hence, according to equation (2)  $c_2$  would move down relative to both  $d_2$  and  $b_2$ , so:  $d_2 - c_2 > c_2 - b_2$ . If the earnings management is substantial, we might even possibly observe:  $b_2 > c_2$ , i.e. lower performance in period  $t=1$  of those companies that just fell short of reaching the threshold would turn into better performance in period  $t=2$ .

Table 1 presents the data regarding positive EPS level threshold and Table 2 depicts the results for positive earnings growth threshold.

**Table 1. Next year's relative performance by groups formed around the positive EPS threshold**

	$a_1$	$b_1$	$c_1$	$d_1$	$e_1$	$a_2$	$b_2$	$c_2$	$d_2$	$e_2$
Mean:	-9,35	-0,11	0,14	0,45	21,10	-5,52	-0,10	-0,08	0,38	8,36
Median:	-1,92	-0,10	0,14	0,45	2,13	-0,21	-0,03	0,12	0,43	1,69
Number:	384	145	360	237	1230	384	145	360	237	1230
	$c_1 - b_1 =$	0,25	<	$d_1 - c_1 =$	0,31	$c_2 - b_2 =$	0,02	<	$d_2 - c_2 =$	0,46

Source: Own calculations.

**Table 2. Next year's relative performance by groups formed around the positive earnings growth threshold**

	$a_1$	$b_1$	$c_1$	$d_1$	$e_1$	$a_2$	$b_2$	$c_2$	$d_2$	$e_2$
Mean:	-30,90	-0,11	0,11	0,35	11,39	2,57	0,16	-0,17	0,11	-7,11
Median:	-1,66	-0,09	0,10	0,34	1,80	0,18	0,00	0,00	0,08	-0,06
Number:	706	237	254	134	657	706	237	254	134	657
	$c_1 - b_1 =$	0,22	<	$d_1 - c_1 =$	0,24	$c_2 - b_2 =$	-0,33	<	$d_2 - c_2 =$	0,28

Source: Own calculations.

According to the results reported in Tables 1 and 2, group C with companies just reaching the thresholds significantly underperforms the group that missed the thresholds, which may be interpreted as the confirmation of the existence of earnings management practices within Polish companies. In both cases, i.e. the positive earnings and recent performance benchmarks,  $e_2 > d_2$ , as should be expected if heterogeneity in earnings outweighs regression towards the mean effect. However, we are mostly interested in the relation between group C and its neighbours, i.e. groups B and D. In both cases  $d_2 > c_2$ , which is not surprising because firms from group D did better in period  $t=1$ . However, also in both cases:  $d_2 - c_2 > c_2 - b_2$ , which means that the relative performance of group C is worse than that of groups B and D. Moreover, in case of positive growth threshold:  $c_2 < b_2$ . Firms that just exceed the threshold “positive growth” appear to “borrow” earnings from the next year’s period, which confirms predictions of the model described by equations (1) and (2).

## 5. Conclusions

Net profit conveys crucial information for financial analysts, investors and different groups of shareholders, who are strongly interested in financial reports of earnings when they monitor executives’ performance. Managerial rewards are often linked to earnings, which in turn creates strong incentives for executives to manage profits of their companies. The analysis presented in this paper assesses the importance of thresholds from the point of view of EM and the consequences that these thresholds have for patterns of reported earnings. Our study shows how efforts to exceed thresholds induce particular pattern of EM among Polish companies listed on the Warsaw Stock Exchange. The empirical findings presented in this paper provide clear support for the existence of EM practices driven by the desire to report positive profits and weaker support for the desire to sustain recent performance. We observe discontinuities in the earnings distributions, which indicates the existence of threshold-based EM effects. It seems, however, that the threshold of positive earnings is more important which provides evidence that the activity of Polish managers in the area of EM resembles the behavior of American executives. We also find evidence that the future performance of firms just reaching the thresholds appears worse than those companies that are suspected to a smaller degree to engage in the EM practices.

Our findings may have important implications for financial analysts, investors and boards of directors in Poland. The relationship revealed in this study for the Polish market may help to predict direction of change in future

earnings and also to control whether the management of a company executes earnings management practices. Explorations of further connection between earnings and stock prices may be useful in creating investment strategies based on the findings from this study, which opens up new space for more research in this area. The results of our analysis confirm also that, similarly to developed markets, the phenomenon of earnings management exists among the companies listed on the stock market in Poland.

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## Streszczenie

### ZARZĄDZANIE ZYSKIEM W POLSKICH SPÓŁKACH GIELDOWYCH

*W artykule zaprezentowano rezultaty analizy zjawiska znanego jako „zarządzanie zyskami”, wśród spółek z polskiego rynku kapitałowego. Przeanalizowano rozkład zysku na akcję wokół progu „zero” oraz progu wyznaczonego w oparciu o wartości zysku na akcję z okresu przeszłego w okresie 1997-2010. Wyniki badania potwierdziły występowanie asymetrii rozkładu zysku na akcję wokół progu „zero” oraz spadek zysków w latach następujących po „zarządzaniu zyskiem” co wskazuje na występowanie analizowanego zjawiska na polskim rynku kapitałowym.*