

# Closing the value gap by the means of stock repurchase program - the case of Warsaw Stock Exchange

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This article shows that announcement of share repurchase programs on Polish market is used as a price catalyst when the spread between intrinsic and market value is large. The article presents determinants, conditions and results of 77 open market share repurchase programs conducted on Warsaw Stock Exchange (WSE) between 2005 and 2010. We find the behaviour of management boards of companies listed on WSE consistent with the market timing theory assumptions, as in most cases managers passed the information to the market without any additional economic costs. Investors who adopted the strategy to invest in undervalued stocks and hold the securities for 6 months realized a total return of 61.15% in the analyzed period.

**JEL Classifications:** G14, G35

**Keywords:** Share repurchase, event studies, market timing

## Introduction

Share price decline below its intrinsic value triggers managers counter reaction aiming at filling the value gap. Designed to fill the information asymmetry and prevent further stock price decline, the share repurchase program is the value enhancement tool used by Polish public companies. Additionally, the list of share repurchase potential benefits includes: the wealth transfer, the change in the capital and shareholder structures, acquisition of shares for merger and acquisition financing or managers remuneration (Dittmar, 2000). The financial management literature emphasizes the substitution of dividends by share repurchases; indicating the transfer of money/wealth as the primary reason. The substitution effect occurs on the developed markets. Research by Grullon and Michaely (2002) points up an increase in the popularity of share repurchases in comparison with dividend payments. Their results show that management boards tend to allocate resources which would have been formerly paid as dividend to share repurchases.

The analyzed value gap between the market value and the intrinsic value may result from: (1) a sharp decrease in share price in recent past or (2) insufficient information, i.e. lack of credible data on future prospects of the company. Regarding the former factor a share repurchase program calls for a reactive type strategy, while in the latter case a proactive information strategy should be realized, only topped with share repurchase actions.

The results of quantitative analysis are well-documented in financial literature focused on large mature capital markets. The early research made on the US capital market confirmed the positive signal sent by the companies about their future financial performance (Dann, 1981), (Vermaelen, 1981). Surprisingly, the positive effect of post-announcement stock increase lasts for a long period of time. The research made Peyer and Vermaelen (2009) which captures the last two decades of previous century stills confirms an existence of abnormal returns followed the stock repurchases. The effects of share repurchases

announcement were scrutinized on markets in: Canada (Ikenberry, Lakonishok, and Vermaelen, 2000), the United Kingdom (Lasfer, 2002), Taiwan (Cheng and Hou, 2013) and Hong Kong (Zhang, 2005). We find a gap in financial literature concerning the size and persistence of share repurchase anomaly on European emerging markets. Few research made on Polish capital market conclude with calculation of short- and long-term abnormal returns (Słoński and Zawadzki, 2011a), (Szyszka and Zaremba, 2011) without detailed analysis.

There are several hypotheses explaining the persistence of share repurchase anomalies. (Grullon and Michaely, 2004) proposed hypothesis related to an intrinsic valuation models: (1) the *risk-change hypothesis*, which states that the abnormal returns signals a decline in growth prospects leading to lower level of systematic risk, together with (2) the *inside information hypothesis*, which would signal an abnormal future cash flows. Since the popularity of stock repurchase in Poland increases with capital market decline we found the *overreaction hypothesis* (Pyer and Vermaelen, 2009) valuable. The overreaction hypothesis argues, that the abnormal returns are a correction of an overreaction to a market value decline prior the repurchase. Similarly to the (Pyer and Vermaelen, 2009) we observe that on the Polish capital market the stock repurchases follow a severe stock-price decline in the past months. According to their research the past stock performance is better predictor of undervaluation than other proxies. Additionally, we test factors which are found to be correlated with future excess returns, such as market-to-book ratio (used as a measure of undervaluation in (Ikenberry, Lakonishok, and Vermaelen, 1995), the size and declared motivation for the repurchase in the company's announcement. The size of the company is important because stock repurchases increase the demand for stock, which in case of upward-sloping supply curves increase the prices immediately (Bagwell, 1992). Small companies stocks are prone to be mispriced, because of low liquidity (Pastor and Stambaugh, 2003), higher default risk, higher bid-ask spread and the different stock market segment organization (Ibbotson, Kaplan, and Peterson, 1997). The overreaction of investors raises the question of managers' ability of timing the market in the moment of repurchase announcement.

The *market timing hypothesis* assumes that while the management board recognizes the shares as undervalued, the investors' are skeptic to this view and see themselves as the ones who time the market better than the managers. Consequently, the repurchase announcement suggests an investment strategy in which one should buy the stocks and wait for the aforementioned increases in price. The strategy does not impose any activities on the management board, the program has to be announced, but does not need to be realized (Ikenberry et. al., 2000). In this way management boards create an option, which has a positive value. To test market-timing hypothesis it is important to know the legal obligations imposed on Polish companies together with implications of corporate governance policy. We find that under Polish law the open share repurchase announcement is not legally binding to the management boards. While on the developed markets a significant portion of the open market share repurchase programs is actually conducted (Stephens and Weisbach, 1998) the Polish capital market due to little shares being repurchased and the low quality of reporting standards stand as a testing ground for the *market-timing* hypothesis. We collect the data about companies which declared undervaluation in open market repurchase announcement in the period 2005-2010. The event study methodology shows, that a share repurchase is a positive information for the shareholders and allows to obtain statistically significant abnormal returns. The interpretation of the signal depends on the size of the company and the level of market-to-book ratio.

The remaining part of the paper is organized as follows. The next section presents the legal implications of stock repurchase programs in Poland. Then we describe the data and analyze motives behind stock repurchase programs. Next, we present the methodology and results of our analysis. In the last section, we present conclusions of our research.

## Legal regulations in Poland - Analysis

On the WSE almost all of the share repurchases announced are open market share repurchases. The program assumptions are revealed to investors in a form of a statement of the management board. The statement establishes: the amount of money allocated to the share repurchase program, the range for the price and the time horizon. It is worth mentioning that quotas announced are usually extremes permissible by the law<sup>1</sup>. The most important legal requirements for stock repurchase programs are:

- The duty to announce the share repurchase by the management after the General Meeting of Shareholder's approval
- The prohibition on buying more than 20% of company's share capital
- The duty to announce the maximum amount of repurchased shares
- The duty to announce the maximum amount of resources allocated to buy the shares
- The duty to announce the time horizon of the repurchase (up to 5 years)
- The duty to announce the maximum amount of shares to buy
- The duty to announce the maximum and minimum price for a share.

The regulations also force restrictions dependent on the market specifics. To such restrictions one can include:

- The prohibition on buying more than 25% of daily turnover of shares
- The declaration of the price ceiling with either the last price of independent turnover or the highest current independent offer in the place of turnover.

The prohibition on buying shares during so called closed periods leads companies to hand over the realization of the repurchase program to a brokerage house. The subsequent packet transactions are an yet unclear obstacle while dealing with tax authorities. What is more important the propositions enclosed in the statement creates no legal obligation to repurchase stocks.

In case of the open market share repurchases, the actual amount of money allocated to share repurchase often doesn't match the one originally stated in the regime. The same applies to the declared number of repurchased shares. The reporting procedure concerning the development of the program lacks quality in numerous cases. For most of the companies it becomes impossible to gather comprehensive data covering the amount and the price of the shares bought during the program. It is also important to note that some of the programs are being realized at a very slow pace (or suspended without any notice). Some of the companies tend to extend their repurchase programs, which prevents investors' from recognizing the actual ending of the share repurchase. It is a common practice that after program completion a summary report is not published. Companies strictly following the regimes they have stated are rather unique. As a consequence the full analysis of share repurchase announcement in the sample may be conducted only after the maximum permissible 5 year period.

All of these concerns are not applicable to share repurchases via tender offer. This type of share repurchase is characterized by a fixed price offer and a short time horizon. In the analyzed period only 6 companies (of which 1 two times) decided to use this regime. Besides one case, all other offers resulted in a resolution with a reduction rate (70% on average). In comparison to an open market share repurchase fixed price tender offer has, from the investor's point of view, a known and certain outcome (although the reduction mechanism does not imply its full effectiveness).

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<sup>1</sup> The Commercial Companies Code, Trading In Financial Instruments Act, Commission Regulation on exemptions for buy-back programs and stabilization of financial instruments.

## Data description

The study was conducted on companies listed on WSE, which during years 2005-2010 conducted an open market share repurchase program, stating share undervaluation as one of the reasons., if company happened to experience abnormal course of significant events in analyzed period it is not present as well. The final size of sample is 76 companies. The whole sample covered 77 of such programs, out of total of 112 which were carried during the analyzed period.

The number of share repurchases varies throughout market and business cycles (Słoński and Zawadzki, 2011b). The analysis of the distribution of share repurchases through time indicates that the bulk of them occurred during the downturn period. During the same time horizon, the number of dividend paying companies amounted to approx. 30% of the whole population of listed stocks.

TABLE 1. THE NUMBER OF SHARE REPURCHASES ON WSE IN 2005-2010

Year	2005	2006	2007	2008	2009	2010
Number of shares repurchase programs	3	10	10	47	29	13

Source: Companies' websites, own preparation

Furthermore, the actual completion of the share repurchase program is in most cases much lower than initially declared. For this reasons we state, that substitution effect of share repurchases may not be acknowledged as a leading motive.

The data gathered in the table 2 shows that the fundamental reason for a program announcement was the undervaluation of shares. Despite the differences between methodologies the results are convergent with surveys of financial managers from USA and Canada (Brav, Graham, Cambell, and Michaely, 2005). In the time analysis none of companies declared 'distribution of cash' as an explicit motive in share repurchase announcement.

TABLE 2. MOTIVES BEHIND SHARE REPURCHASE PROGRAMS ON WSE IN 2005-2010

MOTIVES BEHIND OPEN SHARE REPURCHASE PROGRAM	NUMBER OF COMPANIES
All possible reasons mentioned	4
Undervaluation/ stocks will be redeemed	70
Undervaluation/ to stabilize the stock price	16
Stabilize the stock price	2
Treasury stock (foreign company)	1
Part of management incentive system	9
Offset dilution effect	1
Accomplish M&A process	4
Redesign of stockholders structure	1
No motive stated in share repurchase program	5

Source: Resolution drafts of shareholders annual meetings available on WSE information website

Note: Information was collected from annual meeting of shareholder resolution drafts. On Polish stock market the resolution draft is published weeks before the annual meeting (13 days on average). In some cases, one company pronounce several motives, therefore the total number of companies in table 2 is bigger than the number of companies in the sample.

The analysis of WSE listed companies suggests the reactive strategy to shares undervaluation as a commonly chosen option. Table 3 describes the share price variability during the 200-day period before the share program announcement date (average values in the sample).

TABLE 3. RATES OF RETURN CHARACTERISTICS - 200 DAYS BEFORE THE ANNOUNCEMENT DATE (AVERAGES ACROSS THE SAMPLE)

	Average	Median
Unitized prices in the day of announcement	0.35	0.26
Standard deviation of daily rates of return across	3.07%	3.07%
Daily rates of return	-0.17%	-0.18%
Total shareholder returns	-18.46%	-28.84%
The sum of positive daily returns	192.53%	195.35%
The sum of negative daily returns	-225.79%	-222.27%
The number of positive daily returns	80	81
The number of negative daily returns	95	97
The number of days with zero return	25	22

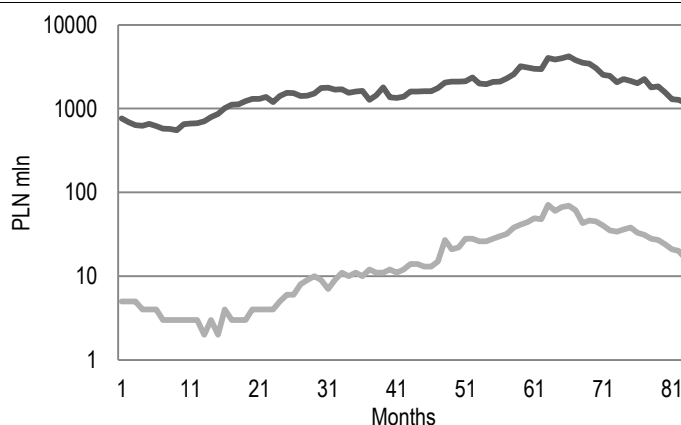
Source: Own calculations

Note: Unitized price in the day of announcement shows the distance from the minimum price (0) and maximum price (1) in analyzed period.

The analysis of the data in table 3 reveals that the announcement of a share repurchase program was preceded by, on average, an 18.46% (28.84% median) decrease in share price. The analyzed period was characterized by high variability of price changes. On the worst day the average of prices constituted only 35% of the maximum observed average (26% for median). Previous studies conducted on the USA data also pinpoint share repurchases as part of a reactive strategy. A research by Peyer and Vermaelen (2005: 361-395) showed that during 6 months preceding the share repurchase announcement there was a significant decrease in the share price of analyzed companies and the following positive abnormal rates of return, were in fact the outcome of investors' excess initial reaction to the unfavourable messages from the companies.

Figure 1 presents changes in the population sample companies' market capitalizations attributed to the first and the last decile during the period 2002-2007. Basing on the information shown on the chart we define "small" companies as those with market capitalization below 100 mln PLN and "big companies" as those with market capitalization above 1,000 mln PLN.

FIGURE 1. LIMIT OF THE FIRST (UPPER LINE) AND THE TENTH DECILE (LOWER LINE) FOR THE COMPANIES QUOTED ON WSE IN 2002-2007 CLASSIFIED IN RESPECT TO MARKET CAPITALIZATION



Source: (Słoński & Kwiatkowski, 2010)

The sample population is divided into three sub-samples depending on the size of the companies - the sub-sample of small companies classifies those enterprises whose market capitalization is below 100 mln. PLN (26 companies), the sub-sample of medium companies consists of those that have market capitalization between 100 and 1,000 mln. PLN (41 companies) and finally the sub-sample of the largest firms encompasses those of market capitalization above 1,000 mln. PLN (9 companies).

The reason for the introduction of the sub-sample of large companies, despite small number of firms it contains, is necessitated by large difference between the largest company's market capitalization and the market capitalization of the biggest enterprise in the middle sub-sample (Plaza Center 772 mln, Multimedia Pl 1,486 mln). Because of the large discrepancies it was unreasonable to include the biggest companies in the sub-sample of middle firms.

In our research a market-to-book ratio is used as proxy for undervaluation using date from the month of announcement. (Pyer and Vermaelen, 2009) used the data from the last fiscal year, the moment in our opinion is too remote, and divide them into quintile. Instead of using quintile, we apply the approach used by investors, who give special attention to a level of ratio equal to 1. The level of ratio below one indicates that the value of equity drops below the level of its historical costs. We used another nominal value of 2 to select the group of relatively well-priced ('glamour') stocks.

## Research methodology

The article uses methodology of event analysis. The analysis consists of examining statistical significance of mean-adjusted abnormal returns driven by the announcement of share repurchase. The first step of the analysis is a determination of expected rates of return. On this basis, the level of abnormal returns is determined. The final step of the analysis is a significance test of the mean abnormal returns. The wide range of expected return models are reviewed by (Campbell, Lo, and MacKinlay, 1996). In the analysis expected rates of return are derived on the basis of the market model (MacKinlay, 1997):

$$\hat{R}_{i,t} = \alpha_i + \beta_i R_{m,t} \quad (1)$$

Where,  $R_{i,t}$  - logarithmic rate of return on stock  $i$  on day  $t$ ;  $R_{m,t}$  - logarithmic rate of return of the market portfolio (WIG index) on the day  $t$ ;  $\alpha_i$  - constant;  $\beta_i$  - coefficient of correlation with the market portfolio.

The parameters for the market model are estimated using the least squares model on the basis of 100 observations from the period  $t-104$  to  $t-5$  ( $t_0$  is the moment of share repurchase announcement).

Abnormal returns are defined as:

$$AR = R_{i,t} - \hat{R}_{i,t} \quad (2)$$

Where,  $R_{i,t}$  - actual rate of return for stock  $i$  on the day  $t$ ,  $\hat{R}_{i,t}$  - expected rate of return for stock  $i$  on the day  $t$ .

The mean return is tested for statistical significance:

$$\overline{AR}_t = \frac{\sum_{i=1}^N AR_{i,t}}{N} \quad (3)$$

Where,  $AR_{i,t}$  - abnormal return on stock  $i$  on the day  $t$ ,  $N$  - sample size.

Test statistic is derived as:

$$t_{stat} = \frac{\overline{AR}_t}{\hat{\sigma}_{\overline{AR}_t}} \quad (4)$$

Where:

$$\hat{\sigma}_{\overline{AR}_t} = \sqrt{\frac{1}{99} \sum_{t=t-104}^{t-5} (\overline{AR}_t - \overline{AR})^2}, \quad (5)$$

$$\overline{AR} = \frac{1}{100} \sum_{t=t-104}^{t-5} \overline{AR}_t \quad (6)$$

$$CAR_t = \sum_{t-k}^t AR_{i,t} \quad (7)$$

$AR_{i,t}$  - abnormal return on the stock  $i$  on the day  $t$ ,

$k$  - assumed parameter,

$t-k$  - assumed day when the accumulation starts.

As for the calculation of abnormal returns the so called market model was assumed (Equation 1). Such an approach allows examining the market situation preceding the period of the analysis of the event. The literature provides examples of different approaches; however, due to the specific situation on the capital markets in the years 2005-2010 (a period of bullish and bearish markets) the market model approach seems to be the most appropriate tool. Hein and Westfall noticed that the bias present in traditional test statistics does not diminish as the sample size increases, and that only bootstrap methods correctly adapt to the non-normal characteristics of the data (Hein, Westfall 2004).

In the next step, the abnormal returns were calculated by the means of bootstrap method as proposed by (Kramer, 2001). We start the process with estimating market models for each of the  $N$  firms in the sample:

$$R_{it} = \beta_{i0} + \beta_{i1}M_{it} + \beta_{iD}D_{it} + \epsilon_{it} \quad i = (1, \dots, N), \quad (8)$$

Where,  $N$  - number of companies in the sample,  $\beta_{i0}$  - coefficients of the model,  $M_{it}$  - market index rates of return,  $D_{it}$  - dummy variables.

Next we calculate  $N$  t-statistics: one for each firm's estimated dummy variable coefficient, next we calculate the conventional  $Z$  statistic for pooled coefficients.

$$Z = \frac{\sum_{i=1}^N t_i}{\sqrt{N}} \quad (9)$$

While conducting conventional inference we would stop at this point and compare the value of the  $Z$  statistic to a critical value from the assumed standard normal distribution. But the distribution usually does not apply, (even as  $N$  is increased) so we have to normalize the statistic to account for the fact that its variance differs from unity. First we compute sample standard deviation of the  $t_i$ :

$$\hat{\sigma}_N = \sqrt{\frac{\sum_{t=1}^N (t_i - \bar{t})^2}{N-1}} \quad (10)$$

Then, divide  $Z$  by  $\hat{\sigma}_N$  to yield the normalized version of  $Z$ :

$$\tilde{Z} = \frac{Z}{\hat{\sigma}_N} \quad (11)$$

In the next stage of this method, the empirical distribution of  $\tilde{Z}$  will be constructed. We construct a collection of *mean-adjusted* t-statistics, denoted  $t^*$  by deducting  $t$  from each of the individual t-statistics:

$$t_i^* = t_i - \bar{t} \quad (12)$$

The mean-adjusted data are used to construct an empirical distribution for  $Z$ . This involves drawing many random samples, from the population of  $t^*$ , a single bootstrap sample is constructed by randomly drawing with replacement  $N$  observations from the collection of  $t^*$ . A total of 1000 such bootstrap samples, individually denoted  $b = (1, \dots, 1000)$ , are constructed, with each bootstrap sample containing  $N$  observations. For each bootstrap sample we construct:

$$Z_b = \frac{\sum_{j=1}^N t_{b,j}^*}{\sqrt{N}} \quad (13)$$

And then normalize it by

$$\hat{\sigma}_{N,b} = \sqrt{\frac{\sum_{j=1}^N (t_{b,j}^* - \bar{t}_b^*)^2}{N-1}} \quad (14)$$



To obtain

$$\tilde{Z}_b = \frac{Z_b}{\hat{\sigma}_{N,b}} \quad (15)$$

Finally ordering the collection of 1000  $Z_b$  statistics from smallest to largest defines the empirical distribution. Inference is conducted by comparing the  $Z$  statistic to critical values from the empirical distribution. If the value of the  $Z$  statistic happens to be larger than 95% of the bootstrap  $\tilde{Z}_b$  statistics or smaller than 5% of the bootstrap  $Z_b$  statistics, one rejects at the 10% level of significance the two-sided null hypothesis of no abnormal returns.

In order to measure the long term impact of open share repurchases on investor's portfolio we used the calendar-time portfolio method. This method aims to measure long-term abnormal returns while minimizing the impact of instability of parameters in time. Highly recommended by Fama (1998), the calendar-time portfolio method allows looking at share repurchases from investors' perspective. We build the three portfolios with 1-, 1.5-, 2 - year holding period. The shares of companies were included in portfolio the next day after the announcement and then kept in portfolio for 1-, 1.5-, 2- years. If portfolio contained less than 3 shares we used Warsaw Stock Exchange as a proxy of average market return (Szyszka and Zaremba, 2011). As proposed by Loughran and Ritter (2000) we have chosen to use equally-weighted returns for further calculations as opposed to suggestions from Mitchell and Stafford (2000) to use value-weighted returns. As argued in Pyer and Vermaeln (2009) large companies are less likely to repurchase their stock due to undervaluation, which leads to reduced usability of value weighting in determining the abnormal returns, moreover the purpose of the research is to assess any persistency in the anomaly, not its total impact on the market. We repeat the question stated by Pyer and Vermaeln (2009) whether managers are truly capable of accurately timing the moment of share repurchase (90% of the managers claim they have the ability to do so, Brav et al., 2005). The portfolio returns were then regressed on market portfolio excess returns. Rates of returns are calculated on daily basis, for the sake of further calculations we compound the rates to obtain monthly rates of return. The next step is to estimate the Jensen-Alfa coefficient and its standard error. We obtain them by estimating the model:

$$R_{p,t} - R_f = \alpha + \beta(R_{WIG,t} - R_f) + \varepsilon_t \quad (16)$$

Using ordinary least squares estimation, where:  $R_{p,t}$  - monthly return from the artificial portfolio;  $R_{WIG,t}$  - monthly return from market index (here WIG);  $\alpha, \beta$  - parameters of the model, where  $\alpha$  is the Jensen-Alfa coefficient;  $\varepsilon_t$  - error term,  $R_f$  - risk free rate.

Our null hypothesis is that the alpha intercept is not statistically different from zero. We test the hypothesis employing the same parametric test presented earlier.

### **The analysis of the impact of an open market share repurchase program on the abnormal rates of return achieved by investors**

In the analysis recommended by Fama (1998) a calendar method was used, which imitates an investment strategy. It assumes an investment in the stocks of companies which announced a share repurchase program, taking into account the specificity of the period. In the period of lesser popularity of share repurchases the number of investments in the portfolio is smaller and *vice versa*. Using Fama's calendar method eliminates the bias of the

time period, because the portfolio is adjusted through time. Table 4 shows the results of holding such a portfolio for 6 months, 1 year, 1.5 year and 2 years respectively.

TABLE 4. CALENDAR METHOD PORTFOLIO PERFORMANCE

Portfolio	0.5 Year	1 Year	1.5 Years	2 Years
Alfa [%, monthly]	0.21	0.04	-0.62	-0.0038
p-value (alfa)	0.051	0.0719	0.0761	0.0546
Return on investment [%]	61.15	14.14	22.26	-28.75
Monthly return [%]	0.66	0.17	0.26	-0.44
Standard deviation (monthly) [%]	0.02	0.0851	0.0826	0.08718
Sharp ratio	0.1417	-0.0289	-0.0194	-0.0986

Source: Own calculations

The highest rate of return could be achieved while holding the particular stocks for 6 months in the portfolio. The total return in the whole investment period equaled 61.15% in 5-year investment period, nevertheless the alpha parameter (although positive and statically significant) amounted to only 0.21 % per month. The average return in Pyer and Vermaeln (2009) for companies which declared both “Undervaluation” and “Best used of money” using Fama methodology equaled 0.61% per month in assuming keeping the stock in portfolio for 12 months after announcement. Similarly to their findings the increase in price occurs only for keeping the stock for relatively short period, then the effect diminishes. The results confirm the *market-timing* hypothesis for Polish companies.

Investors who want make an investment decision during the very moment of the announcement must anticipate the results of a program. Table 5 shows the abnormal rates of return for the whole sample, using the bootstrap method proposed by Kramer (2008).

TABLE 5. REGRESSION PARAMETERS ESTIMATES AND BOOTSTRAP PROCEDURE RESULTS - FULL SAMPLE

$\beta$	1st spec.					2nd spec.					3rd spec.
	Day 0	Day-4	Day-3	Day-2	Day-1	Day 0	Day 1	Day 2	Day 3	Day 4	Event window
Mean [%]	1.05	0.26	-0.22	0.30	0.48	1.03	0.68	0.48	0.47	-0.05	0.27
Max [%]	23.28	14.63	6.03	9.57	9.35	23.06	11.00	9.53	13.65	10.16	2.99
Min [%]	-8.12	-4.07	-11.87	-5.74	-9.94	-7.77	-8.59	-7.52	-9.11	-11.68	-1.42
>0	43	36	39	43	36	42	47	37	43	37	41
<0	34	41	38	34	41	35	30	40	34	40	36
Significance											
$\bar{z}$	1.90**	0.65	-0.80	0.58	1.02	2.02**	2.07**	1.51	1.69	-0.44	2.36***
99.5 percentile	2.17	2.13	2.84	2.61	2.86	2.17	2.42	2.25	2.31	2.83	2.31
97.5 percentile	1.60	1.71	2.28	1.98	2.14	1.85	1.97	1.72	1.73	2.02	1.88
95 percentile	1.44	1.54	1.73	1.62	1.87	1.60	1.61	1.52	1.53	1.65	1.58
5 percentile	-1.87	-2.00	-1.46	-1.60	-1.50	-1.91	-1.73	-1.68	-2.05	-1.65	-1.70
2.5 percentile	-2.26	-2.45	-1.78	-1.97	-1.71	-2.21	-2.00	-2.00	-2.47	-1.85	-1.95
0.5 percentile	-3.00	-3.06	-2.29	-2.75	-2.26	-2.91	-3.05	-2.65	-3.03	-2.25	-2.96

Source: Own calculations

Note: \*\*\* - 1%, \*\* - 5%, \* - 10% significance level.

The *1<sup>st</sup> spec.* column shows the results of estimation for the day of the announcement only (*day 0*). The group of columns denoted as *2<sup>nd</sup> spec.* shows the results of estimation for each particular day in the event window (days -4 to 4). The *3<sup>rd</sup> spec.* shows the results for joint effect estimations. The data indicates that in the days 0 and 1 there are positive abnormal rates of return, respectively, 1.03% and 0.68%. However, the analysis of investors' reaction

in *day 0* is ambiguous, because the range of dispersion is wide. In the day 0 as much as 35 companies (45.5% of the sample) realized negative abnormal returns. The same ratio in the whole sample of US companies amounted to only 10.7% with short-term abnormal return equal to 3.5% (Vermaelen, 1981). In Pyer and Vermaeln (2009) abnormal returns for 'undervalued' companies measured over three days around the repurchase announcement topped 3.7%.

Further analysis demonstrated that the effect of the share repurchase program announcement depends on the company's financial parameters. In the next part of the article market capitalization and market-to-book value ratio were used to form two subsamples. Tables 6 and 7 present statistically significant results of the analysis for different subsamples of companies.

TABLE 6. REGRESSION PARAMETERS ESTIMATES AND BOOTSTRAP PROCEDURE RESULTS - COMPANIES WITH MARKET CAPITALIZATION BELOW 100 M. ZLOTY

$\beta$	1st spec.					2nd spec.					3rd spec.
	Day 0	Day-4	Day-3	Day-2	Day-1	Day 0	Day 1	Day 2	Day 3	Day 4	Event window
Mean [%]	2.01	0.58	0.62	-0.33	0.44	2.03	1.32	0.43	0.62	0.98	0.64
Max [%]	13.63	5.12	5.53	2.66	6.29	13.76	8.42	9.53	5.00	8.49	2.72
Min [%]	-3.17	-3.15	-6.85	-4.25	-3.00	-3.17	-2.87	-7.52	-2.68	-4.41	-0.56
>0	18	13	16	13	11	18	19	13	16	18	19
<0	8	13	10	13	15	8	7	13	10	8	7
Significance											
$\bar{z}$	***2,75	1,23	1,34	-0,56	1,23	***2,77	***2,32	0,77	1,42	**2,12	***3,91
99.5 percentile	2,48	2,26	2,87	3,07	2,25	2,51	2,12	2,33	2,52	2,30	2,60
97.5 percentile	1,85	1,80	2,15	2,31	1,79	1,99	1,75	1,94	2,01	1,88	2,06
95 percentile	1,54	1,52	1,71	1,81	1,46	1,61	1,47	1,58	1,62	1,50	1,72
5 percentile	-1,93	-1,79	-1,49	-1,53	-1,94	-1,80	-2,22	-1,81	-1,93	-1,92	-1,76
2.5 percentile	-2,26	-2,20	-1,71	-1,79	-2,58	-2,28	-2,69	-2,15	-2,32	-2,31	-2,05
0.5 percentile	-2,96	-3,02	-2,21	-2,25	-3,82	-2,91	-3,81	-3,00	-3,02	-2,82	-2,73

Source: Own calculations

Note: \*\*\* - 1%, \*\* - 5%, \* - 10% significance level.

TABLE 7. COMPANIES WITH MV TO BV RATIO BETWEEN 1 AND 2

Day	AR [%]	CAR [%]	Max [%]	Min [%]	p-value	>0	<0
-4	0.21	0.21	14.55	-3.54	0.7703	11	11
-3	0.01	0.23	5.39	-11.75	0.9837	11	11
-2	0.83	1.05	5.59	-5.66	0.2538	14	8
-1	0.86	1.91	7.77	-4.33	0.2364	12	10
0	1.67	3.58	23.03	-7.94	0.0229	12	10
1	1.31	4.89	10.19	-6.10	0.0726	13	9
2	1.08	5.97	10.12	-3.69	0.1389	13	9
3	1.19	7.15	7.10	-9.05	0.1033	17	5
4	-0.63	6.52	9.04	-11.79	0.3860	11	11

Source: Own calculations

While concerning the market capitalization, the highest average abnormal rates of return were observed for small companies with market capitalization below 100 mln PLN. The

cumulative abnormal rate of return in first two days amounted to 3.35%, and the fraction of companies with negative abnormal returns was only 26.9%. For bigger companies the effect diminishes, becoming statistically insignificant for companies with market capitalization above 1bn PLN.

The second division was based on the market-to-book ratio. The strongest effect could be seen in the group of companies with the ratio between 1 and 2. The cumulative abnormal rate of return in the first 2 days amounted to 2.98%, but the proportion of negative abnormal returns was 43.2%.

## Conclusion

The analysis of market regulations shows that share repurchase announcement bears different legal obligation than dividend announcement. The share repurchase program announcement imposes no legal obligation regarding post-announcement activity. In consequence, in majority of cases share repurchase reporting standards are low and companies do not follow the program assumptions. For that reason one cannot treat the share repurchase as an equivalent of the dividend payout. Moreover, a wealth distribution is not stated as a motive in the repurchase program. An improvement in reporting standards would amplify the signal sent by managers to investors and enhance accuracy of investor's short-term reactions. Consequently, the gap between an intrinsic and market value would close faster. Current market regulations favor strategies based on market-timing approach but if the motives for share repurchase are different then managers efforts could meet with failure.

On Polish capital market share repurchase program is an effective tools of share price stabilization. The research shows that managers have a good sense of market timing, thus the message send to the market participants creates the investments opportunity for 'contrarian' investors. The strategy of holding shares in a portfolio for 6 months allows achieving a return equal to 61.15% and keeping the shares for a longer period in the portfolio deprives value. This evidence, together with a negative long-term returns observed after equity issues (Loughran and Ritter, 2000), proves managers ability to time the market. Market imperfections create opportunities to take advantage of uninformed investors and reward long-term shareholders. Nevertheless, in the case of open market repurchases on Polish market, there is a need to create an index which would measure the extent of program's completion and reporting quality.

The analysis of the short-term reaction to share repurchase announcement gives ambiguous conclusions. The significant fraction of shares in the sample (45.5%) reacts unfavourably. In order to distinguish and refine companies in the sample we propose to use market-to-book ratio and market capitalization. The abnormal returns on equities from 1 to 2 market-to-book ratio brackets are slightly higher. More attractive results are for small capitalization companies (3.35% abnormal returns on average). In further research we recommend to refine results by finding better proxies of company's ability to close the value gap.

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