Chapter VI.

The Effect of Dividend Announcements on Stock Returns for Banking Sector: Evidence from the Polish Stock Market

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The capital market allows to make transactions between sellers and buyers of long-term funds – corporate and government securities – and plays a significant role for both firms and investors. It allows firms to interact with investors so as to get external financing resources and investors to obtain the securities at market prices. The prices respond to new information that is available for investors. Thus, the price of the stock reflects all relevant information in an efficient market.

Informational content of dividends was introduced by Merton Miller and Franco Modigliami (MM) in 1961. They suggested that the dividend distribution provides useful information about manager's perspectives of company's profitability. Although MM stated that dividend payments do not cause the change in stock prices, later dividend-signaling hypotheses supported the dividend effect on market return. Thus, the dividend policy of the company remains one of the channels through which investors receive information. However, there is no commonly defined way of investors' reaction to these signals provided by dividend policy.

A lot of theories have been developed so as to explain the relationship between dividend payouts and firms' market value. They could be divided into two main schools of thought: those that argue in favor of dividend irrelevance and those that argue in favor of relevance of dividend payments in determining the firm's stock price.

According to the dividend irrelevance theory firstly developed by Modigliani and Miller (1961), the dividend policy does not affect the firm's market value. This view was a new wave in the finance theory. On the other hand, taking into account various market imperfections (such as, taxes, agency problem, transactions costs etc.), a lot of theories have been developed. They show the relevance of dividend policy for determining the market return. Some of them

suggest that high dividends increase share value ('bird-in-the-hand' theory), others – that low dividends increase share value (the tax preference theory). The informational content of dividends (signaling), the free cash flow hypothesis, the agency cost theory, and the clientele effects also explain the dividend relevance. Although numerous investigations have been conducted over the decades, there is no general consensus among relevance and irrelevance hypotheses of dividend policy.

A great majority of empirical studies that investigated the dividend announcement effect on the stock return for the last decade also indicate that there is no common market reaction to dividend announcements. Thus, Gurgul and Majdosz (2005), Miletic (2011), and Abdullah Al Masum (2014) found out a positive relation between dividend changes and reaction of stock prices, whereas Kadıoğlu, Telçeken and Öcal (2015) defined a significantly negative relationship. Moreover, the study of Zia and Kochan (2015) showed a negative market reaction to dividend announcement decrease. Some researchers such as Bayezid and Chowdhury (2010), Sharma (2011), Pan, Tang, Tan, and Zhu (2014), and Nezum and Jashim Uddin (2014) did not find statistically significant abnormal market return for dividend announcements.

The banking studies of dividend impact on the stock market are limited. In the majority of dividend investigations, the banking sector has been excluded due to its highly leveraged operations and the highly regulated sector. However, the banking industry, due to its opaque nature, is characterized by a more pronounced reaction to different market signals. Especially, informational signals for investors that dividend payouts contain become more important during the financial crisis when the financial information for the banks became limited. Therefore, the sector's features make the investigation of dividend policy for banking industry interesting.

Poland is a relatively new market that faced a lot of changes over the last decade in terms of size, the number of domestic and foreign participants, and the role in the economy. Moreover, equity as an investment opportunity instrument appeared in Poland only in 1990s. Currently, the Warsaw Stock Exchange is a mid-size European stock exchange and belongs to one of the largest exchanges of the Central and Eastern Europe. Moreover, the lack of empirical studies regarding investor's behavior in response to the dividend announcement for Polish banking sector, especially during the crisis period, make this study relevant and valuable.

Research aim. The aim of the work is to investigate the reaction of the stock market to the announcements of cash dividend payments of the companies belonging to the banking sector and listed on the Warsaw Stock Exchange. The study attempts to investigate whether there is a significant reaction of investors to

changes in dividend policy of the companies and, hence, if it affects significantly stock returns of those companies.

After the review of literature and empirical works, it is believed that the effect of dividend announcements on the stock return will be statistically significant. MM theory that suggests dividend irrelevance is based on the set of assumptions of perfect market and rational investors; therefore, it is supposed that the dividend irrelevance theory is hardly supported under the market imperfection. On the other hand, theories that favor dividend relevance take into account various market imperfections (such as taxes, agency problem, transactions costs etc.) that exist in the real world. Therefore, it seems that banking dividend distribution affects the stock prices of Polish market due to the fact that the market imperfections exist, and dividend payments could signal needful information to investors regarding banks' current and future perspectives and risks.

Thus, in order to shed some light on the debate about the effect of dividend signaling on the stock prices, the main hypothesis that will be tested by the current study is defined as follows:

The cash dividend announcements affect the stock prices.

In order to evaluate the impact of the event, abnormal returns measure is applicable. Abnormal return (AR) is defined as a difference of the actual return and the expected return given the absence of the event. The statistically significant cumulative abnormal return (CAR) that is sum of AR will indicate that the effect of dividend announcements on the marker return exists; as a result, the dividend relevance theories will be proved. If CAR is statistically equal to zero, then dividend payment announcements will have no effect on stock prices of the analyzed companies; therefore, the irrelevance theory developed by Miller and Modigliani (1961) will be proved.

Therefore, the main research questions of this paper are determined as follows:

- Is there a significant effect of dividend announcement on stock returns for WSE listed companies?
- What is the impact of cash dividend announcement on the price of stock in the banking sector?
- Is the reaction of investors to dividend payments before and after the financial crisis different?
- On which day the effect of dividend announcement on stock prices is the strongest?

The ten year period from 2006 till 2015 is chosen for research so as to widely analyze the dividend announcement effect on stock returns. The investigation includes recession period that gives the chance to examine whether there are any

differences between the investors' reactions for different phases of economic cycles: expansion and recession. The impact of the global financial crisis on the Warsaw Stock Exchange occurred between November 2007 and January 2009 that was accompanied by 57.95 per cent drop of WIG Index and by 72.24 per cent of WIGBANK Index. Thus, the time line of the study includes 2006–2007 as a period before the crisis; 2008–2009 – during the crisis; 2010–2015 – post-crisis period.

Bloomberg database is used as a source of collection of the announcement dividend data and daily closing prices for companies' stocks, WIG and MSCI Europe Banks Indices. Moreover, the statistical data connected to the analyzed stock exchange is obtained from WSE website. The stock price reaction to 43 dividend announcements for six banks has been examined with the help of event-study methodology.

Research objectives. Based on the research questions, the research objectives are determined as follows:

- To examine the existing dividend theories and their empirical results.
- To analyze the effect of dividend announcements on share prices for the banking sector of WSE.
- To investigate the impact of the global financial crisis on the banking dividend policy and on investors' reaction to dividend payments.
- To compare the obtained results with the previous studies and financial theories.

The significance of the study. The impact of dividend announcements on stock returns is important knowledge for investors. Based on the information of price movements, shareholders could make decisions about further investments. Also, this knowledge provides financial managers with the information on how their dividend policy decisions influence the company's value.

The study will fill up the lack of empirical researches regarding investor's behavior in response to the dividend announcement for the Polish market during the pre-crisis, crisis, and post-crisis periods. The investigation in this work will help to clarify the effect of cash dividend announcements on stock returns, understand the way investors perceive the news about the dividend announcements, and provide financial managers with the information of how their dividend policy decisions influence the company's value.

The paper is organized in the following way: The first section includes the theoretical background of dividends, shows the effect of dividend policy on the firm value through different theories, and investigates the way of taking the decision by the company to pay dividends and information context for investors about future opportunities. In section II, empirical literature review of the stock prices reaction on the dividend announcements is described; the tendencies in

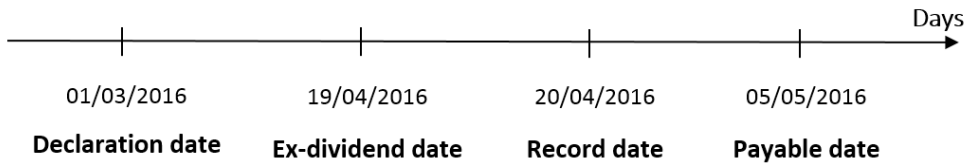
dividend policies are shown with the banking sector and crisis period specifications. SectionIII provides empirical analysis and results of the dividend announcements' effect of 6 companies belonging to banking sector and listed on Warsaw Stock Exchange. In Conclusion, results of theoretical and empirical researches of the work are included.

Dividend Policy and the Mechanism of Paying Dividends

According to the financial theory, the main objective of dividend policy is the maximization of shareholder's return which consists of capital gains and dividend payments. Thus, the dividend policy of the company has a direct effect on these two parts.

Lawrence J. Gitman and Chad J. Zutter (2015, p. 628) define firm's dividend policy as "a plan of action to be followed whenever it makes a dividend decision". Therefore, the dividend policy is a guideline companies use in their decisions regarding the portion of earning that should be distributed in the form of dividend payments and which portion should be retained. The most important issues of dividend policy are payout ratio that could be determined as percentage of dividends in the whole earnings, and retention ratio – 100 per cent minus payout ratio (Brealey & Myers 2003, p. 432).

Figure 1. An example of cash dividend payment of ING Bank Slaski S.A.



Source: Bloomberg, author's own calculations.

The standard mechanism of cash dividend payment begins with the meeting of the Board of Directors of the firm regarding the further dividend payments. This day is known as the *Declaration day*. The Board of Directors takes decision about the dividend amount, the date of record, the ex-dividend (ex-date) date, and the payment date (see Fig.1). The meeting could be organized every year or semiannually, or quarterly, or with a special occasion. Therefore, the declaration date, also known as the announcement date, is the day when the company announces basic information about the next dividend payment.

On the *Record date*, the corporation's books are closed in order to register the names of legal shareholders that will receive dividend payments. Therefore, people from this list will take part in the dividend distribution even if they are not already beneficial owners. The changes in beneficial ownership, for instance, as a result of share selling, will occur after re-registration. Those people that were the shareholders on the date of record are able to receive dividends.

The ex-dividend date (the ex-date) determines the day from which the security begins to be traded without current benefits (dividends). As a rule, the ex-date takes place two (one) business days before the date of record. Therefore, if the equity is sold on or after the ex-dividend day, the seller will receive the dividend payments; meantime the buyer will not retain the benefit. Furthermore, generally, the market will react to this event with share price declines by about the dividend's amount (Loader 2014, p. 49).

The day when the dividends are distributed to shareholders on the record is the *Payable day* that is about two weeks later than the record date (Brealey & Myers 2003, p. 432).

The company's value of stock determines the present value of all dividends in the future that could be received by common stockholders. The dividend distribution in a company follows its payout policy. Corporate payouts show not only the distribution of cash flow to stockholders, but also indicate the useful information regarding company's performance (present and future). Corporate managers develop dividend policies in order to maximize stock price because dividend policies have a great impact on share prices (Gutman & Zutter 2015, p. 636).

A low payout ratio could be accomplished by higher market prices as the earnings growth will be supported. In this case, shareholders' return will be mostly via capital gains. As a rule, dividend yield – the ratio of dividend per share and market price per share – for growth companies will be low. However, it does not mean that a low payout policy will obviously lead to higher prices because investors might find some uncertainty regarding capital gains that will be in distant future. The effect of dividend policy on stock prices is hardly identified as market prices reflect many factors.

On the contrary, a high payout policy could lead to lower market prices per share as it decreases the retained earnings compared to the amount of paid dividends. High payout policy means more current dividends, less retained earnings, and lower capital gains, which could be accepted by investors as lower earnings in the future; hence lower prices per share are observed. Due to the fact that in most countries, tax value on dividends is bigger compared to capital gains, investors prefer capital gains rather than dividend payments. However, investors sometimes go in favor of current payments via dividends rather than future

earnings. Therefore, different investors would prefer different payout policy of company (Pandey 2010, 293–295).

A lot of theories were developed regarding the relationship between dividend policy and firm's value (see Appendix 1). Two main groups of theories could be determined: theories that maintain dividend relevance and those that argue the dividend policy does not influence company's market return (dividend irrelevance). In the meantime, it seems there is no consensus on whether dividend payments matter or not.

Dividend Irrelevance Theory

According to the residual theory of dividends, the company should distribute earnings in the form of paying dividends after all available sufficient opportunities; for example, when its return from investment will not exceed the cost of capital. This means that company's dividends should be treated as a "residual" and not as a way of influence on company value. This approach corresponding to *Dividend irrelevance theory* developed by Merton Miller and Franco Modigliani (MM) (1961).

MM were the pioneers in the investigation of the relation between dividend changes announcements and stock prices which was explained by "the informational content of dividend" (Miller & Modigliani 1961, p. 430). They discovered that stock prices and dividend policy are independent and showed the irrelevance of dividend policy in perfect capital market. Therefore, they demonstrated that dividend decisions do not influence firms' value or costs of capital. MM claimed that firm's earnings and risk of its investments have the impact on the value of the company and not the ratio of earnings distribution between dividends and retained/reinvested earnings (Miller & Modigliani 1961, p. 425). The researchers reported that the value of the firm is not determined by the dividend distribution in the perfect market under such circumstances as certainty, no personal or corporate taxes, no issuance and transaction costs, and fixed investment policy.

However, the real market does not maintain these assumptions. Thus, taxation that is historically higher for dividends compared to capital gains could indicate that a better way for shareholders is retaining profits rather than receiving dividends. Nevertheless, MM argued that not all types of investors pay taxes on dividends and capital gains (for instance, for such institutional investors as pension funds); consequently, the payout policy of certain companies does not affect the amount of taxes should be paid. Therefore, MM argued that the change of dividend policy

leads only to allocation of ownership and not to a change in firm's value: tax-sensitive investors would prefer to invest in companies that pay dividends; meantime, investors that should pay high taxes for dividends would desire to invest in firms that retain more earnings (Gutman & Zutter 2015, p. 626).

Although MM claimed that the investor's required return and, as a result, firm's value and share prices are not affected by dividend policy, they determined that dividends provide information about firm's future earnings and cash flow. MM showed that, via information content, dividends could decrease the level of asymmetric information that appears as a result of unequal information disposed by managers and shareholders regarding future company's performance. Insider knowledge about future firm's cash flow and earnings that is available for managers could be shared with owners through the dividend declaration as a way of communication.

To sum up, dividend irrelevance theory firstly developed by Miller and Modigliani (1961) suggests that, in perfect capital market, the firm's value or the share price will not be affected by the chosen dividend policy.

Dividend Relevance Theories

"Bird-in-the-hand" theory. "Bird-in-the-hand" theory that follows relevance principle of dividend policy was developed by Myron J. Gordon (1962) and John Lintner (1962). This theory indicates a positive relation between firm's dividend policy and market value of share. It is based on risk aversion of investors: they prefer current premium in the form of dividend payments rather than risky future income in the form of future dividend or capital gains. Thus, the name and the context of the theory relate to the phrase: "A bird in the hand is worth two in the bush".

The Walter Model. The Walter model that was developed by professor James E. Walter maintains the idea that dividend policies almost always have an impact on the firm's value. Walter (1963) argued that the relationship between the company's rate of return and its cost of capital is significantly important in developing dividend policy for the firm.

Agency cost theory. One of the theories that supports the concept of dividend impact on firm's share prices is the agency cost theory. Agency costs are the costs that appear due to the divergence of opinions between managers and owners of the company (Frankfurter 2003, p. 100). Thus, managers could want to increase company's assets with the help of retaining earnings so as to have greater compensation. On the other hand, the owners afraid that company's earnings could be distributed to managers' own fund. Therefore, in order to

assure shareholders that managers will not waste owner's money, the company promises to pay dividends regularly, which increases investors' costs.

Free cash flow hypothesis. Free cash flow hypothesis explains the positive relation between dividend announcements and stock prices. Taking into account the agency costs theory and market information asymmetric, Jensen (1986) was first who indicated free cash flow theory. Efficient managers distribute the cash flow to profitable projects in order to improve company's performance and maximize stockholders' wealth. Sometimes, managers of cash-rich companies with unavailable profitable projects for investing could invest free cash flow in projects with negative net present value. Consequently, in order to avoid waste, dividend payments can be used to distribute the cash flow of the company and reduce the agency costs. According to Jensen (1986), such dividend communication by managers with shareholders allows not only to reduce the agency costs but also decrease the probability of investment in wasteful projects with negative net present value.

The tax preference theory. According to the Modigliani and Miller's (1961) assumptions, there is no difference in taxes for dividends and capital gains. However, in the real world, taxes play a significant role in terms of dividend policy and firm's value. Investors always take into account the taxation factor. According to the Tax preference theory (Brennan (1970), Litzenberger and Ramaswamy (1979), John and Williams (1985), Miller and Rock (1985), Ambarish et al. (1987), the tax tension for dividends is higher compared to capital gain. The dividends are taxed directly, whereas capital gains – only after the security sold. Therefore, the theory determines the preference of investors for a low dividend ratio. This theory claims that the low dividend payout ratio supports the cost of capital to be lower; hence, higher stock price (Brigham & Houston 2004: 523–524). However, some empirical results did not support the relevance of the tax preference theory (Omet 2004; Reddy 2006; Anil and Kapoor 2008).

Moreover, the dividend **clientele effect** was developed by Black and Scholes (1974) and Miller and Scholes (1982). This effect differentiates preferences of investors regarding paying dividend or retaining due to such a factor as taxation. Therefore, different rates in taxation of capital gains and dividend yields determine the relation between dividend enclosure and market reaction. Thus, in case of taxation the capital gains at a lower rate, no reaction between dividend and share price could be determined (Miller & Scholes 1982). In such circumstances, shareholders will prefer earnings to be retained by the company. If the company changes its dividend policy and initiates more dividend payments, investors in case of relatively low capital gain taxes will sell their shares so as to avoid paying taxes. However, there will be indifferent investors'

behavior regarding dividend and capital gain policies when the taxes are equal for these types of income.

Informational Content of Dividends

Informational value of dividends gives support to dividends' relevance. So as to form a positive impression on shareholders, a company could proclaim future earnings' growth. However, in order to strengthen the effect on investors, distribution of cash by dividend payments could be done. Therefore, cash payments will ensure shareholders regarding company's profitability and positive expected perspectives. When the dividend policy of a firm changes significantly with the increased dividend payout ratio, investors accept this news as a signal for permanent or long-term growth of expected earnings. As a result, the share prices are affected by changes of dividend announcements payments. Moreover, informational content of dividend changes could also influence investors' perception about the risk of the firm to provide a stable dividend policy.

Literature Review of the Stock Prices Reaction to the Dividend Announcements

This Chapter contains the review of previous empirical investigations regarding the dividend announcement effect on company's market return. It covers the studies of banking sector, Polish market dividend payouts, and the tendencies of dividend payout policies during the financial crisis. Although a large number of studies have been conducted, the empirical results could not unanimously solve the debates regarding the impact of dividend policy on the company's value.

A great number of empirical studies on dividend effects have been conducted over the last decades. The early studies are controversial regarding divided influence on stock prices. Thus, Fama (1969), Griffen (1976), Laub (1976), Pettit (1972), Amihud and Murgia (1997) demonstrated a positive relation between returns and dividend changes. Whereas Ang (1975), Watts (1973), and Gonedes (1978) could not support this hypothesis in their investigations determining little or no effect of dividend disclosure. The former indicated the information content of dividends; announcement of dividend's increase signals about future cash flows of company and has great cumulative abnormal return. In other words, the investors interpret increase/decrease of dividend payments as a signal from the company regarding future earnings that the expected to change in the same

direction. Consequently, the increase in dividend could be treated as a positive signal, investors begin to bid up the share prices; in the meantime, decrease in dividend payments leads to selling investor's shares and, as a result, decrease in stock prices.

D. S. Docking and P. D. Koch (2005) studied the sensitivity of investors' reaction to the recent direction of the underlying market movement. They found out that the impact of dividend announcement change on stock prices is greater when the news of the announcement goes against the previous tendency of market return. Thus, according to their investigation, the declaration of lower dividend payments will lead to stronger decrease in the market prices when previously the company's market prices showed an upward tendency during the six weeks before the announcement. And, in case of dividend decrease, the news would have a greater effect on market return if it has recently been normal or down. Moreover, market volatility was also included into the investigation. The researchers concluded that high market volatility provokes the higher degree of uncertainty that may transfer to higher firm's uncertainty regarding specific news.

The studies of Sharma (2011) and Pan, Tang, Tan, and Zhu (2014) analyzing Indian and Chinese markets, respectively, over the approximately the same period of time did not determine a significant market reaction to cash dividend announcements. Meantime, Miletic's (2011) results were in favor of dividend relevance. Some of them found a negative relationship between cash dividend announcement and the market reaction (Kadıoğlu, Telçeken and Öcal 2015; Viera 2011), others (Vazakidis & Athianos 2010) – a positive reaction over the pre-announcement period.

Current research is different from those discussed above as it aims to analyze the banking sector that is excluded by most scholars. Moreover, the study is based on the analysis of the Polish stock market that is relatively new, and there is lack of dividend announcement studies for this market.

The empirical investigations about dividends of banking sector are limited. A great number of studies that investigate the dividend policy exclude the banking industry from the study due to the strong banking regulations that restrict the bank's financial leverage and influence on income distribution process.

Banks are characterized by paying a larger dividend compared to commercial companies. Therefore, the relation between the dividend policy and bank risk is very important to investigate. Thus, E. Onali (2009) provided research about the relation between banking dividends and two kinds of risk – default and credit risk. The investigation included a sample of 335 banks for the period of 2000–2007. He found a positive relation between dividends and default risk and a negative relation between the former and retained earnings which

is controversial to the literature findings regarding nonfinancial firms. Moreover, the investigation of the banking sector showed that dividend payments are coherent with "inside/outsider agency issues, profitability, and size" that is similar to nonfinancial companies.

Those studies that investigated the dividend announcements effect on the market value for the banking sector showed contradictious results even for the same market. Thus, testing Bangladesh market reaction to banking dividend announcements, Bayezid and Chowdhury (2010) and Nezum and Jashim Uddin (2014) identified no significant effect on the stock price, whereas Abdullah Al Masum (2014) suggested a significantly positive effect of dividend policy on the market return.

Current research will examine the effect of informational contest of dividend announcements on the Polish stock return applying event study methodology. The event study is not a new approach but only some of the above-mentioned studies have been conducted using this method. Moreover, contrary to the previous studies, the current investigation will show the results separately for different phases of economic development which will help to examine the effect of dividend payout policy on stock return for company's expansion and recession periods.

The increasing consolidation, changes in production technics, and regulations are important issues for the banking sector of Poland as well as for all European countries. The period of 1997–2009 for the Polish banking sector was characterized by rapid changes: changes in ownership structure and consolidation processes occurred.

Empirical Analysis of the Dividend Announcements' Effect on the Stock Return

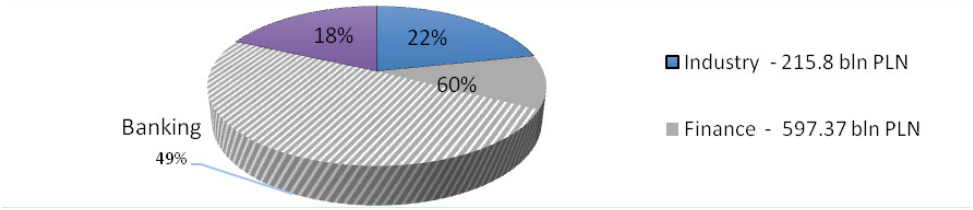
This section includes a short description and analysis of Warsaw Stock Exchange and 6 banks selected for investigation. Moreover, the methodology for empirical analysis is provided. In the end, the results of the dividend announcements' effect of 6 companies belonging to the banking sector and listed on Warsaw Stock Exchange are described.

Data Description

The Warsaw Stock Exchange (in Polish: Giełda Papierów Wartościowych w Warszawie) was founded in April 12, 1991. There are 487 companies listed on the Warsaw Stock exchange, 434 of which are domestic companies. The total market capitalization of the exchange is 994,727.98 million PLN (domestic market capitalization. 527,820.19 million PLN) in 2016 (WSE website).

The companies listed on the WSE are classified into different sectors of the economy depending on their business activities and revenue structure by the members of Index Committee of WSE. The sectors are grouped into three macrosectors, which are: Industry, Finance, and Services. The most valuable macrosector is Finance with 597.37 billion PLN market capitalization in 2016, which is about 60 per cent of the whole WSE. The market capitalization of the banking sector that is included into the Finance macrosector is equal to about 49 per cent of the total WSE market capitalization (WSE website). It makes the banking sector most valuable among the WSE's sectors (Fig. 2).

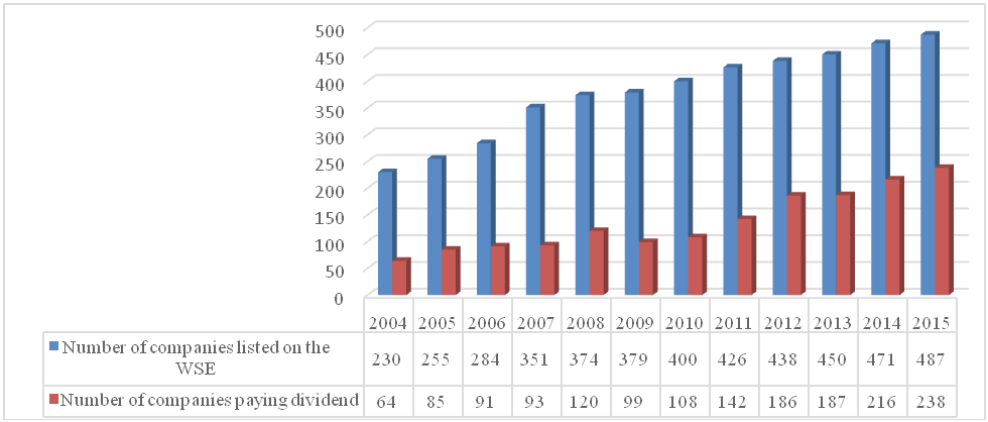
Figure 2. Market capitalization of WSE by sector, 2016.



Notes: The grey lines indicate the part of the Financial macrosector that corresponds to banking sector. *Source*: WSE website (2016).

The dividend payments on the WSE were done for the first time in 1992 by six out of nine listed companies. Over the years, the number of listed companies significantly increased which was accompanied by gradual increase in companies that distribute dividends to their shareholders. Companies are not required to issue dividends and could choose retained earnings instead of dividend initiations. The number of dividend paying companies could be seen in Figure 3.

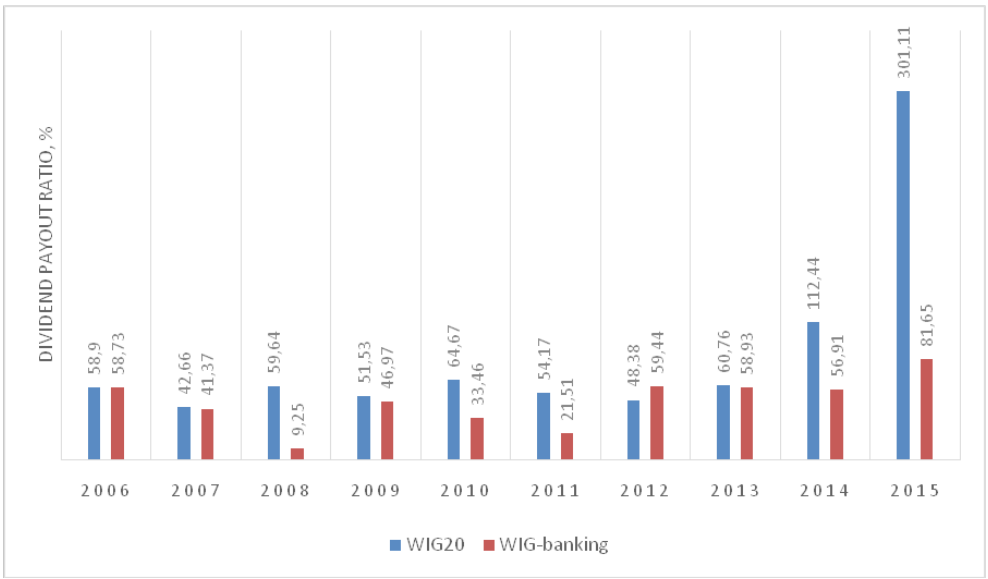
Figure 3. Number of companies paying dividends compared to the total number of companies listed on the WSE for the period 2004–2015.



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of companies listed on the WSE	230	255	284	351	374	379	400	426	438	450	471	487
Number of companies paying dividend	64	85	91	93	120	99	108	142	186	187	216	238

Source: Interia Biznes and WSE websites (2016).

Figure 4. Dividend payout ratio for WIG20 and WIGBANK Indices for 2006–2015 period.



Source: Bloomberg (2016).

In 2008, when the crisis in the financial market occurred, the share of dividend paying companies reached 32.1 per cent, which was higher compared to previous years. The number of companies that distribute dividends declined significantly over 2009 and 2010 which was equal to 26.1% and 27%, respectively. However, from 2011, the number of dividend-yielding stocks started to increase.

Over the 2011–2012, it rose enormously; thus, in 2011 it reached 142, in 2012 – 186 (which accounted for about 42 per cent). The increase tendency of dividend paying companies remained over the last years: the share of dividend paying companies in 2014 and in 2015 was equal to 46 and 49 per cent, respectively.

The dividend payout ratio for 20 largest companies and all banks listed on the WSE could be seen in Figure 3.3. The ratio is calculated as the percentage of total cash common dividends from normalized earnings[1] (Bloomberg). The dividend payout for the banking sector of WSE significantly declined in 2008 to 9.25 per cent; in the meantime, for the 20 largest companies, the ratio was almost 60 per cent this year. However, in 2009, the dividend payout ratio for both indices was equal to more than 46 per cent. Over the last years, the tendency of increased dividend payouts is observed.

Among 487 companies listed on the WSE, 15 companies belong to the banking sector. For the research purposes, only the companies that are listed for the whole analyzed period, namely 2006–2015, were selected so as to widely examine the changes in the dividend policy of the companies through the determined period of time. Thus, after excluding the banks with the first list date after 2005, 10 companies in the banking sector remained, among which 6 companies paid comparatively regular dividends for the last five years. Therefore, for further investigation of the impact of dividend announcements on stock return, six banks listed on WSE have been taken (Table 1). The selected banks are highly market capitalized and account for 86.6 per cent of the total WIG-banking portfolio.

Table 1. List of the companies selected for the current investigation.

Full name	Ticker	Date of first listing	Market value (mln PLN)
BANK POLSKA KASA OPIEKI SA	PEO PW Equity	Jun 1998	39777.3
POWSZECHNA KASA OSZCZĘDNOŚCI BANK POLSKI SA	PKO PW Equity	Nov 2004	31625.0
BANK ZACHODNI WBK SA	BZW PW Equity	Jun 2001	28078.4
ING BANK ŚLĄSKI SA	ING PW Equity	Jun 1994	15403.8
BANK HANDLOWY W WARSZAWIE SA	BHW PW Equity	Jun 1997	10523.3
BANK MILLENNIUM SA	MIL PW Equity	Aug 1992	7278.7

Sourse: WSE website and Bloomberg (2016).

[1] Normalized earnings – earnings that are adjusted for cyclical variations in the economy (Scott 2003).

The short characteristics of the banks taken for investigation are provided below.

BANK HANDLOWY W WARSZAWIE SPÓŁKA AKCYJNA (BHW) is a Polish bank that is based in Warsaw and was established in 1870. It is the eighth largest bank in Poland with 2.4 billion market value. In 2001, the bank was merged by Citigroup and, currently, operates by the brand name Citi. Since June 1997, BHW has been listed on the WSE and included to the WIG20 Index (BHW website).

BANK ZACHODNI WBK SPÓŁKA AKCYJNA is the third largest Polish bank that is based in Warsaw, Wroclaw, and Poznan. It was founded in 2001 by the merger of Bank Zachodni S.A. and Wielkopolski Bank Kredytowy SA and has been listed on the WSE since June 2001. Since 2011, the Bank has been owned by the Santander Group (Spanish bank). In 2013, it merged with Kredyt Bank (WBK website).

ING BANK ŚLĄSKI SPÓŁKA AKCYJNA (ING BSK) is a Polish commercial bank based in Katowice. It was founded in 1988 as a result of dividing from the National Bank of Poland.ING BSK has been listed on the WSE since January 1994. Since 2011, it has operated with the current name as a result of merger with ING Bank N.V. Branch. Currently, it is the fifth largest bank listed on the WSE with 3.9 billion PLN market capitalization (ING Bank Slaski SA web-site and WSE website).

BANK MILLENNIUM SPÓŁKA AKCYJNA is a Polish commercial bank that was founded as Bank Inicjatyw Gospodarczych S.A. in 1989. It was the first financial institution that started to be listed on the WSE in 1992. The bank merged with Lodzki Bank Rozwoju S.A in 1992, with Bank Gdanski S.A. in 1997 and has been cooperated with the Portuguese bank Millennium BCP since 1998. Since 2003, it has been named as Bank Millennium (Bank Millenium website).

BANK POLSKA KASA OPIEKI SPÓŁKA AKCYJNA is a Polish bank founded in 1929 as a national bank with headquarters in Warsaw. Currently, 59 per cent of the company belongs to Italian bank UniCredit. From 1998, the bank has been listed on the WSE. It has around 1000 offices in Poland (PEO website).

POWSZECHNA KASA OSZCZĘDNOŚCI BANK POLSKI SPÓŁKA AKCYJNA is the largest Polish bank with 20.6 billion market capitalization (about 31 per cent of the whole Polish banking sector). The bank was founded in 1919 and has been listed on the WSE since 2004. In 2000, the Bank became wholly-owned subsidiary of the State Treasury (PKO website).

The data for the empirical research have been obtained from the Bloomberg database. Thus, the historical daily closing stock prices for selected 6 banks, for indexes WIG, WIG20, WIG-banking, and MSCI Europe Banksfor the time period from January 2005 till the end of December 2015 have been collected.The data

for such a corporate action as dividend announcement events have been taken from Bloomberg for the period January 2006 – December 2015 so as to analyze the dividend announcement events over 10-year period starting from 2006. The announcement dates were obtained only for cash dividend payments as, usually, in the studies, they are examined separately from the stock dividend distribution due to a different effect on stock returns. Thus, the dates of cash dividend announcements were checked with stock splits and stock dividend events in order to exclude concurs. Over the analyzed period, only ING Bank had stock split (1:10); however, in November 2011, the company did not provide the dividend announcement. The stock return for those split has been adjusted via dividing the first price after the split by 10. Therefore, the split would not distort the results of the investigation. The announcements of omitted and canceled dividend payments also were not included into the investigation. Therefore, for 6 selected banks listed on WSE, 43 cash dividend announcements from the 2006 till the end of 2015 were found (Table 2).

All defined dividend announcements were classified in three categories depending on the change direction. Based on the Nur-Adiana, Rosemaliza, and Yusnidah's (2002) method of classification, the dividend reduction by 10 percent and more was defined as a negative dividend change; dividend increase by 10 percent and more was separated to the positive dividend changes category; the other dividend changes that were not included into the mentioned categories belonged to neutral dividend changes. After the categorization, 27 positive, 13 negative, and 3 neutral dividend changes have been defined.

The tendency of omitted dividends occurred during the crises period: in 2008, half of analyzed companies initiated dividend payments; whereas, in 2009, only PKO (Powszechna Kasa Oszczędności Bank Polski Spółka Akcyjna) paid dividends among the 6 banks.

The impact of the global financial crisis (the burst of the "credit bubble") on the Warsaw Stock Exchange occurred between November 2007 and January 2009 that was accompanied by 57.95 per cent drop of WIG Index. The market return diminished by 72.24 per cent over the same period for WIGBANK Index (Fig. 5). The highest price drop was in October 2008 (-31.13% of WIGBANK Index) and over the first two months of 2009 (about -26% of WIGBANK Index).

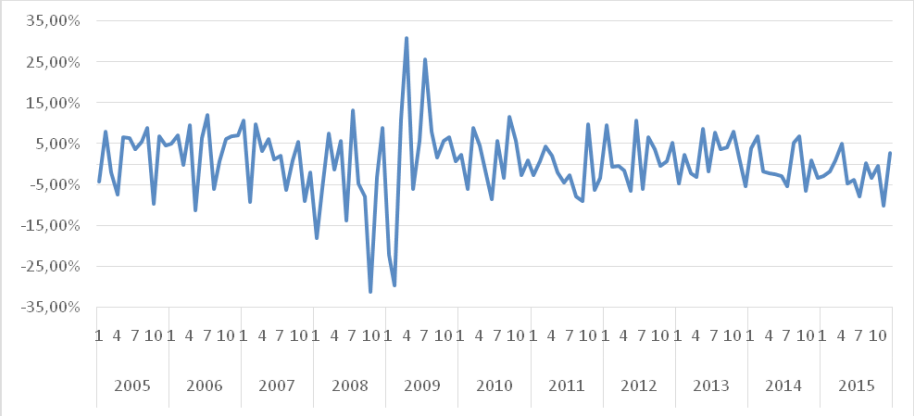
The price movements of the 6 analyzed banks are shown in Figure 6. The stocks of MIL PW Equity, PKO PW Equity, and ING PW Equity are highly volatile. Thus, the stock price for these companies declined drastically over the financial crisis period compared to other three analyzed companies. The strong drop of market prices for ING Bank in the last quarter of 2011 was associated with the stock split (1:10).

Table 2. The dividend announcement events for selected 6 companies over 2006–2015.

Stock	BHW	BZW	ING	MIL	PEO	PKO	
Frequency of dividend payments	**A**	**A**	**A**	**A**	**A**	**A**	**Total number of events by year**
2006	*28.03.2006*	*22.02.2006*	*31.03.2006*	*19.01.2006*	*23.03.2006*	**18.04.2006**	6
2007	*14.03.2007*	22.02.2007	*23.04.2007*	**26.03.2007**	*16.03.2007*	*23.03.2007*	6
2008	-	-	**10.04.2008**	*10.03.2008*	-	*09.04.2008*	3
2009	-	-	-	-	-	**08.06.2009**	1
2010	**13.04.2010**	*02.03.2010*	-	-	**15.03.2010**	*13.04.2010*	4
2011	*08.03.2011*	*02.03.2011*	*16.02.2011*	**31.03.2011**	*09.03.2011*	*05.05.2011*	6
2012	**13.03.2012**	01.03.2012	-	-	**26.04.2012**	**09.05.2012**	4
2013	*12.03.2013*	**08.03.2013**	-	-	*15.03.2013*	*18.04.2013*	4
2014	*06.03.2014*	*04.03.2014*	*04.03.2014*	*04.02.2014*	*11.03.2014*	**29.04.2014**	6
2015	*10.03.2015*	-	**24.02.2015**	-	11.02.2015	-	3
Number of events per company	8	7	6	5	8	9	43

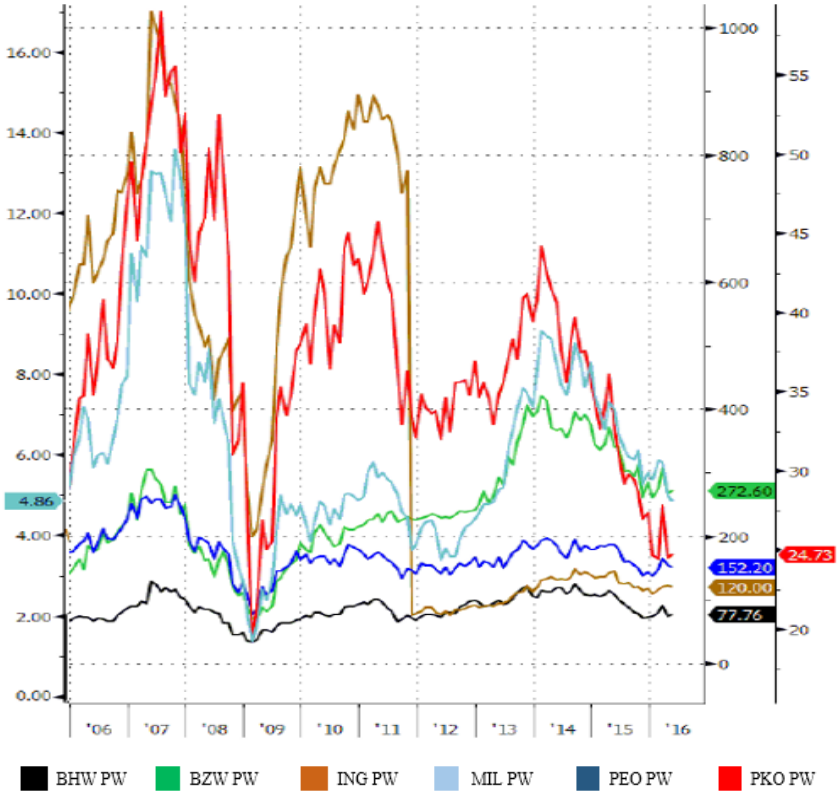
Notes: All dividend events were divided into three groups depending on the dividend change: italic color stands for positive dividend changes (>10% increase); bold – for negative (>10% decrease); and the regular font – for neutral dividand change. The frequency of dividend payment A means annually dividend distribution.
Source: Bloomberg (2016).

Figure 5. WIGBANK Index market return over 01.2005–12.2015 period.



Source: Google Finance (2016).

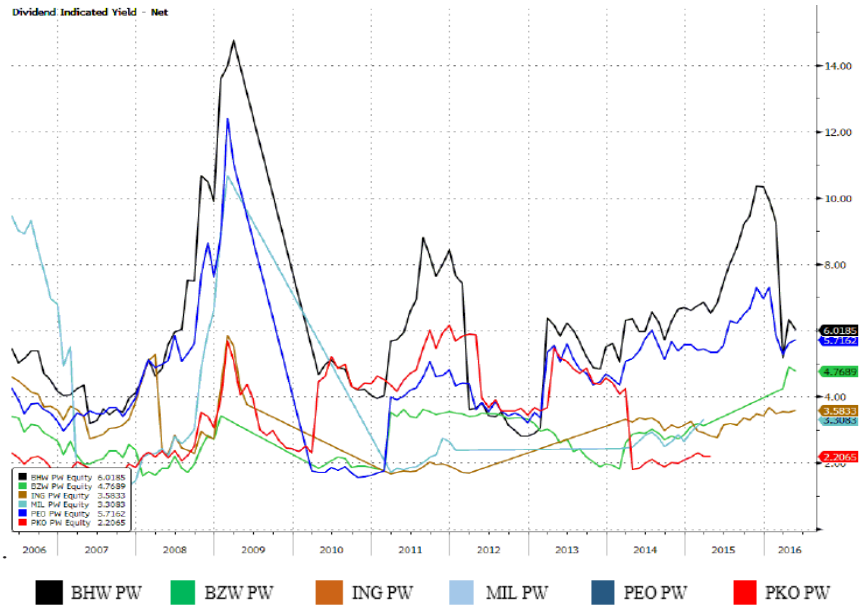
Figure 6. Historical last prices for six banks listed on WSE for the period of 2006–2016.



Source: Bloomberg (2016).

The average dividend yield for the banking sector of WSE for the last 7 years equals to 2.8. Figure 7 demonstrates the significant increase of dividend indicated yield[2] of analyzed banks over 2008–2009 years which occurred mainly due to the drastically drop in stock prices. The dividend yield increase over 2011 was also supported by price decline. However, from 2012, the increase of the indicator was accomplished by increase in dividend payments. The above determined dependences could be observed through the tendencies of stock prices (see Figure 6) and dividend payout ratio (see Figure 4) which determine the dividend yield.

Figure 7. Dividend Indicated Yield for 6 banks listed on the WSE, 2006–2016 period



Source: Bloomberg (2016).

In order to estimate market return for the current empirical research, WIG Index has been chosen. WIG Index is a price index that has been calculated since April 16th, 1991. The calculation of this Index is based on the value of portfolio that includes shares of all companies listed on the WSE.

[2] Dividend indicated yield could be found by dividing the most recent dividend multiplied by the number of dividend payments per year by the current stock price (measured as percentage) (Bloomberg).

The industry return has been measured with the help of MSCI Europe Banks Index. This a free-float weighted equity index was developed with a base value of 100 in December 31st, 1998. MSCI Europe Banks Index includes large and mid capitalized banks across 15 Developed Markets countries in Europe (Bloomberg).

Additionally, in the work, such indices as WIG20 and WIG-banking are mentioned. However, these indices were not included into the regression as they contain the same data and the model could regress share prices in the indices that already consist of them. Three analyzed banks account for more than 30 per cent of the WIG20 index. And, these two indices are based almost on the same stock prices. Therefore, in order to avoid such problems of econometric estimation, WIG Index and of MSCI Europe Banks Index have been used.

WIG20 Index is a price index that has been calculated since April 16th, 1994. The calculation of this index is based on the value of portfolio that includes shares of 20 major and the most liquid companies in the WSE. Moreover, the number of companies from the same exchange sector could not exceed 5 companies. Thus, PKO, PEO, and BZW stocks are included to WIG20 Index with the share in the portfolio of 13.4%, 12.2%, and 5%, respectively.

WIG-banking is a sectorial sub-index that has been calculated by the WSE since December 31st, 1998. It allows to estimate the efficiency of investments into the banking sector. The index is based on the same as WIG Index methodology and also includes the income from dividend and subscription rights. Currently, WIGBANK Index includes 15 banks. The analyzed 6 banks amount to 86.6 per cent from the total WIG-banking portfolio.

The WIG Indices are calculated as below:

$$\text{Index} = \frac{\text{Current capitalization}}{\text{Underlying capitalization} * \text{Adjustment factor}} * \text{Index underlying value}$$

Where Index underlying value is 1 279.56 points for WIG-banking and 1 000.00 points for WIG and WIG20 Indices (WSE website).

The research methodology

The applied event study methodology is widely used and is not unique. It was described in the paper of Campbell, Lo and MacKinlay (1997). An efficient market reacts to all types of news and announcements and incorporates this information into stock prices. Dividend announcements as a type of events directly

affecting equity market prices could be measured by unexplained residual-abnormal return – of the model below:

$$r_t = \alpha + \beta r_t^M + \gamma r_t^I + e_t \quad (1)$$

where r_t – daily stock return,
r_t^M – market portfolio return,
r_t^I – industry-specific return,
e_t – abnormal return.

All returns have been calculated with the help of the bellow formula:

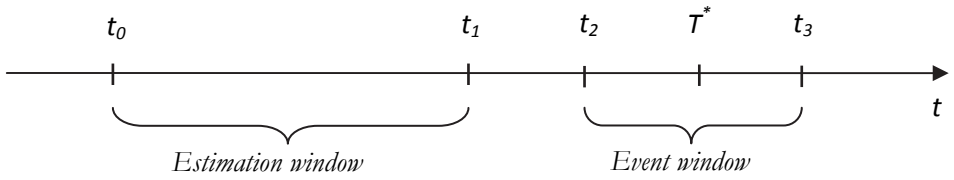
$$r_t = \frac{\left(P_t - P_{t-1}\right)}{P_{t-1}} \quad (2)$$

where P_t stands for the particular daily close price.

Market return, r_t^M, is the return on WIG Index that represents "market". It is value-weighted return on the all shares traded on the Warsaw Stock Exchange. Industry-specific return, r_t^I, is return on another market index – MSCI Europe Banks Index. General market trends are well-captured by the representative Indices.

The impact of the dividend announcements on the stock prices are estimated by measuring cumulative abnormal returns (CAR) during the event windows. An event window $[t_2;t_3]$ is defined as an interval of time around the specific event (T^*) during which the market reacts to the news and appropriately adsorbs obtained information by adjusting prices. In terms of the present research, the dividend announcement stands for the event that is expected to influence the share prices. The estimation window $[t_0;t_1]$, on the contrary, is a period of time before the event during which the market model is estimated (see Figure 8).

Figure 8. Event Study Periodization.



Estimation window used for our computational analysis is fixed at [-180; -12] days before the actual event. It results in 168 business days' length $[t_0;t_1]$ which is relevant to the annual frequency of the dividend announcements in our data sample. The estimation window covers eight months for estimation of the normal

returns and do not concur with the event window, which makes the selected interval appropriate.

For testing purposes, nine event windows for each event are constructed. All possible combinations of [-2; +2] business days are as follows: [-2; 0], [-2; +1], [-2; +2], [-1; 0], [-1; +1], [-1; +2], [0; 0], [0; +1], [0; +2]. Day 0 is the actual event date. Before the dividend announcements, market participants form certain expectations regarding the future event. After the actual announcement took place, the stock prices move appropriately adsorbing the coming data. Suggested length of the event windows is more or less standard for such event studies. It is believed to be long enough to estimate the impact without bringing additional "noise" and distorting significance of the results. The database is discrete and does not include weekends and holidays when the stock exchange is closed.

The event study methodology includes a sequence of steps described below.

Firstly, the parameters (α, β) of the equation (1) are estimated during the estimation windows for each event of each company during the examined 10-year period.

Secondly, e_t – error term – is calculated for each event for all combinations of event windows:

$$e_t = r_t - \alpha - \beta r_t^M - \gamma r_t^I \tag{3}$$

Thirdly, cumulative abnormal returns (CAR) are obtained as a sum of error term element of the equation for all time shifts:

$$CAR_t = \sum_{j=t_0}^{t} e_j \tag{4}$$

The final step is to determine whether CAR is statistically significant or not. In case of its significance, this means that the effect of dividend announcements on the marker return exists. On the other hand, if CAR is not statistically significant, dividend announcements do not influence any abnormal returns and it is impossible to get extra return by applying event arbitrage investment strategy. In this case, firm dividend policy is irrelevant and does not bring any relevant information to the stock market.

CAR could also be positive or negative. Statistically significant and positive CAR could be explained as dividend announcements having a positive impact on abnormal returns. A negative sign of CAR means that suggested event respectively has a negative impact on the estimated abnormal return.

To examine the response of the event on the return and determine whether the abnormal return is statistically significant, the t-test was employed. It is the leading test statistics used in the event studies (Ahern 2009). The t-statistic is

estimated by dividing the average event-period abnormal return by its estimated standard deviation:

$$T\text{-}test = \frac{\frac{\sum AR}{N}}{\frac{AR\_SD}{sqrt(N)}} \tag{5}$$

where *AR* is the abnormal returns (i.e. CAR), *AR_SD* – the abnormal return standard deviation, and *N* – a number of days in the event window (Princeton University Library 2008).

If the absolute value of test is lower than 1.64, then the average abnormal return for the stock is not statistically significant. The ranges below determine the significant difference from zero at the 10, 5, and 1 per cent levels:

$1.96 < \text{t-test} \leq 1.64$- significant at 10 per cent level;

$1.96 < \text{t-test} \leq 2.32$- significant at 5 per cent level;

$2.32 \leq$ t-test- significant at 1 per cent level.

Thus, the research hypothesis is tested over the constructed data sample by applying described above methodology. It enables to make further generalization regarding the dividend relevance under specific circumstances for the banking sector of the Polish stock market.

Empirical Results

The analyzed data sample consists of the daily data for six companies representing the banking sector that are listed on the Warsaw Stock Exchange.Each company investigated in the current research pays out dividends annually with the exceptions for years when all earnings were retained. A banking dividend announcement served as a central event in the event study. The purpose of the present research was to check whether a dividend announcement as type of event influences the stock prices. The event study methodology was applied for the investigation and is described in the respective section of this paper. Cumulative abnormal returns (CAR) and their significance are tested for 9 possible event windows.

The main finding of the performed analysis is the significant impact of the dividend announcements on the cumulative abnormal returns just after the actual announcement occurs. Thus, the statistically significant effect on the market return mostly occurs in two event windows, mainly: [-1;0] and [0; +1].

The summary of the results for mentioned event windows for all companies analyzed is presented in tables 3.3. and 3.4. In the efficient highly liquid

Table 3. The summary of the results for [-1;0] event window for the whole data sample.

Stock		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BHW_PW	**CAR**	-0.0049***	-0.041			-0.0237	0.0146	-0.0143	0.0184	0.0148	0.0326***
	t-stat	(-6.8491)	(-1.2388)			(-0.7591)	(0.6402)	(-1.4318)	(0.8693)	(1.4128)	(3.9731)
BZW_PW	**CAR**	-0.048	-0.0608*			-0.0241	0.0049	-0.0014*	-0.0214***	-0.0287	
	t-stat	(-1.5726)	(-1.7552)			(-1.4727)	(0.6181)	(-1.7296)	(-4.3603)	(-1.2545)	
ING_PW	**CAR**	-0.005	0.0097***	-0.0087			-0.0062***			-0.0047	-0.008
	t-stat	(-0.8823)	(2.7436)	(-0.9107)			(-4.3572)			(-0.4606)	(-0.6361)
MIL_PW	**CAR**	-0.0123	-0.0181***	0.0316			0.0068			0.0605	
	t-stat	(-0.5257)	(-13.1963)	(0.6097)			(0.703)			(0.7691)	
PEO_PW	**CAR**	-0.0083	0.0167			-0.0078	0.0161	0.018	0.0255	0.0189***	-0.024
	t-stat	(-0.5259)	(1.1615)			(-1)	(0.5219)	(0.4215)	(1.038)	(6.2277)	(-1.4142)
PKO_PW	**CAR**	-0.0077	-0.0247***	0.0043	-0.0265	0.0001	0.0133***	0.0243	0.0165	0.0031	
	t-stat	(-0.2966)	(-2.4324)	(0.2346)	(-0.8645)	(0.079)	(12.3681)	(0.8903)	(0.5855)	(0.2644)	

Notes: T-statistics is in the parenthesis. The stars marked next to CAR indicate statistical significance: *** – at 1% level; ** – at 5% level; * – at 10% level.

Table 4. The summary of the results for [0;+1] event window for the whole data sample.

Stock		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BHW_PW	**CAR**	-0.0057***	-0.0353			0.0075***	-0.0082	-0.0022	-0.0028	0.0126	0.0366***
	t-stat	(-22.6098)	(-0.8887)			(16.1523)	(-0.4217)	(-0.098)	(-0.4626)	(1.2795)	(2.9957)
BZW_PW	**CAR**	-0.0393	-0.0708***			-0.0039	-0.0107**	-0.0011	-0.0165***	-0.0029	
	t-stat	(-1.082)	(-2.8602)			(-0.5877)	(-2.2823)	(-0.1997)	(-4.0458)	(-0.1196)	
ING_PW	**CAR**	-0.0053	0.0066	0.0283			-0.0296**			-0.0074	0.0046
	t-stat	(-0.189)	(0.8407)	(1.064)			(-2.0537)			(-0.8539)	(0.6709)
MIL_PW	**CAR**	0.0422**	-0.0259**	0.0672***			-0.0029			-0.0182	
	t-stat	(2.1053)	(-1.9757)	(4.1325)			(-0.2226)			(-0.2964)	
PEO_PW	**CAR**	0.0074	0.0205*			-0.0084	-0.0148	0.0436***	0.025	0.0079	-0.0205
	t-stat	(0.5347)	(1.9391)			(-1)	(-0.679)	(2.5378)	(0.6696)	(0.6285)	(-0.7569)
PKO_PW	**CAR**	0.0321**	-0.0239**	0.0114	-0.0811***	0.0008	0.0123	0.0258	-0.0117	0.0075	
	t-stat	(2.3188)	(-2.1813)	(0.503)	(-3.3887)	(0.0591)	(0.9404)	(0.6647)	(-0.4588)	(0.7473)	

Notes: T-statistics is in the parenthesis. The stars marked next to CAR indicate statistical significance: *** – at 1% level; ** – at 5% level; * – at 10% level.

financial market, all the incoming public information is immediately adsorbed and incorporated in the stock prices. Market participants form their expectations in advance, and after the actual announcement takes place, they adjust their beliefs. Due to the fact that the current research covers daily price data (not the intraday data), it seems to be most appropriate to focus on the short period of time just before and shortly after the event. The estimation results for other event windows are provided in Appendices 3-8.

The summary of the results presented in table 3 and table 4 confirms the main hypothesis that the dividend announcements have a significant impact on the cumulative abnormal returns of the sample companies from the banking sector listed on the WSE.

Table 5. Statistical significance of CAR over tested event windows for each company analyzed during 2006–2015 period.

Stock	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	% of significant CAR for each company
BHW_PW	+	-			+	-	-	+	+	+	63%
BZW_PW	-	+			+	+	+	+	+		86%
ING_PW	+	+	+			+			-	-	50%
MIL_PW	+	+	+				-			-	60%
PEO_PW	-	+			+	-	+	-	+	-	50%
PKO_PW	+	+	-	+	+	+	-	-	-		56%
% of significant CAR for each year	67%	83%	67%	100%	100%	60%	40%	50%	60%	25%	

Notes: In case of the statistically significant CAR on dividend announcements, the event is marked as "+"; otherwise "-". If the cash dividend announce was omitted, the sell is blank.

On average, 65 per cent of the dividend announcements have been followed by statistically significant CAR. Table 5 demonstrates which events had a statistically significant impact (marked by "+") and which did not have (defined as "-") in different event windows over the 10-year period. Moreover, it could be seen that during the financial crisis the percentage of significant dividend announcements in the whole number of events increased. Thus, almost all dividend

announcements influenced stock market return significantly over 2008–2010 period. This means that the informational content of dividend announcement for investors was pronounced during the crisis. Additionally, over the last four years, only about half of dividend announcements are supported by significant investor's reaction.

Nevertheless, the direction of the relationship between the dividend announcements and the cumulative abnormal return is not obvious as some of dividend events show a direct relationship with the stock returns, some of them – inversed. The direction of dividend change and market reaction on it are visualized in table 6.

The positive and negative dividend changes are accompanied by the respective sign of CAR in case of 56 per cent of dividend announcements. Thus, almost 60 per cent of increased (decreased) dividend announcements lead to increase (decrease) in stock prices, whereas all neutral dividend announcements showed a negative market reaction. Therefore, it seems that increased dividend payments signals positive future perspectives of the company to investors and lead to stock returns' improvement. However, about 37 per cent of analyzed dividend events show the inverse relationship between dividend direction and market returns.

The tendency of omitting dividend announcements occurred in 2008 when the WSE faced the financial crisis[3]. Thus, half of the analyzed companies canceled dividend announcements. However, for those three companies that initiated the dividend payments in 2008, the results of CAR were mixed. The ING stock faced negative market return of dividend announcement at [-2;0] window with significance at 10 per cent level. The second bank initiated dividend payments in 2008 (MIL) obtained a positive investor's reaction at the [0;+1] and [0;+2] event windows with statistical significance at 1 per cent level. Meantime, there was not significant impact on the return of PKO stock for this year.

In 2009, only one of six banks initiated the dividend announcement that was accomplished by the negative CAR on the first day after announcement with the statistically significance at 1 percent level. Already in the next year, the companies recovered the dividend announcements. Thus, in 2010, four of six companies and, in 2011, all companies decelerated dividend payments. Over these two years (2010–2011), almost all dividend declaration events were associated with the statistically significant abnormal return across the different tested

[3] The impact of the global financial crisis on the Warsaw Stock Exchange occurred between November 2007 and January 2009 by 57.95% drop of WIG Index and by 72.24 % for WIGBANK Index (author's calculations).

Table 6. The summary of the results for [-1;0] and [0;+1] event windows for the whole data sample with mentioned dividend change direction.

		[-1;0]									
		2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
BHW_PW	*CAR*	**-0.0049*** **	-0.041			-0.0237	0.0146	-0.0143	0.0184	0.0148	**0.0326*** **
	t-stat	(-6.8491)	(-1.2388)			(-0.7591)	(0.6402)	(-1.4318)	(0.8693)	(1.4128)	(3.9731)
BZW_PW	*CAR*	-0.048	**-0.0608***			-0.0241	0.0049	**-0.0014***	**-0.0214*** **	-0.0287	
	t-stat	(-1.5726)	(-1.7552)			(-1.4727)	(0.6181)	(-1.7296)	(-4.3603)	(-1.2545)	
ING_PW	*CAR*	-0.005	**0.0097*** **	-0.0087			**-0.0062*** **			-0.0047	-0.008
	t-stat	(-0.8823)	(2.7436)	(-0.9107)			(-4.3572)			(-0.4606)	(-0.6361)
MIL_PW	*CAR*	-0.0123	**-0.0181*** **	0.0316			0.0068			0.0605	
	t-stat	(-0.5257)	(-13.1963)	(0.6097)			(0.703)			(0.7691)	
PEO_PW	*CAR*	-0.0083	0.0167			-0.0078	0.0161	0.018	0.0255	**0.0189*** **	-0.024
	t-stat	(-0.5259)	(1.1615)			(-1)	(0.5219)	(0.4215)	(1.038)	(6.2277)	(-1.4142)
PKO_PW	*CAR*	-0.0077	**-0.0247*** **	0.0043	-0.0265	0.0001	**0.0133*** **	0.0243	0.0165	0.0031	
	t-stat	(-0.2966)	(-2.4324)	(0.2346)	(-0.8645)	(0.079)	(12.3681)	(0.8903)	(0.5855)	(0.2644)	

		[0;+1]									

		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BHW_PW	*CAR*	**-0.0057*** **	-0.0353			0.0075***	-0.0082	-0.0022	-0.0028	0.0126	**0.0366*** **
	t-stat	(-22.6098)	(-0.8887)			(16.1523)	(-0.4217)	(-0.098)	(-0.4626)	(1.2795)	(2.9957)
BZW_PW	*CAR*	-0.0393	**-0.0708*** **			-0.0039	-0.0107**	**-0.0011**	**-0.0165*** **	-0.0029	
	t-stat	(-1.082)	(-2.8602)			(-0.5877)	(-2.2823)	(-0.1997)	(-4.0458)	(-0.1196)	
ING_PW	*CAR*	-0.0053	**0.0066**	0.0283			**-0.0296** **			-0.0074	0.0046
	t-stat	(-0.189)	(0.8407)	(1.064)			(-2.0537)			(-0.8539)	(0.6709)
MIL_PW	*CAR*	0.0422**	**-0.0259** **	0.0672***			-0.0029			-0.0182	
	t-stat	(2.1053)	(-1.9757)	(4.1325)			(-0.2226)			(-0.2964)	
PEO_PW	*CAR*	0.0074	0.0205*			-0.0084	-0.0148	0.0436***	0.025	**0.0079**	-0.0205
	t-stat	(0.5347)	(1.9391)			(-1)	(-0.679)	(2.5378)	(0.6696)	(0.6285)	(-0.7569)
PKO_PW	*CAR*	0.0321**	**-0.0239** **	0.0114	-0.0811***	0.0008	**0.0123**	0.0258	-0.0117	0.0075	
	t-stat	(2.3188)	(-2.1813)	(0.503)	(-3.3887)	(0.0591)	(0.9404)	(0.6647)	(-0.4588)	(0.7473)	

Notes: All dividend events were divided into three groups[1] depending on the dividend change: green color stands for positive dividend changes (>10% increase); red – for negative (>10% decrease); and grey – for neutral dividend change. The frequency of dividend payment A means annually dividend distribution. T-statistics is in the parenthesis. The stars marked next to CAR indicate statistical significance: ***- at 1% level; **- at 5% level; *- at 10% level.

[1] The classification is based on the Nur-Adiana, Rosemaliza, and Yusnidah's (2002) method and described in data description part.

event windows; whereas about 45 percent of the dividend announcements over 2012–2015 period were statistically significant (Tables3 and 5).

To sum up, the presented above results confirm the banking dividend announcement relevance for the Polish market return over 2006–2015 period. Thus, about 65 percent of announced events affected the market return for the whole period. Moreover, during the financial crisis, almost all of the dividend initiations were accompanied by significant stock market response. Moreover, the tendency of the forward relationship between dividend change direction and stock market return is observed in 56 per cent cases of dividend initiations. Thus, more that in half cases, the tendency of investors' reaction to dividend changes is observed as follows: positive dividend changes lead to positive market return and the announcement of negative dividend change negatively affect the stock prices.

Conclusion

A great majority of theoretical and empirical studies have been produced to define the relationship between dividend payouts and firms market value, especially, after the publication of the dividend irrelevance theory by MM (1961). However, after several decades of investigating the issue, there is no consensus about dividend payment influence on stock returns.

The literature on dividend policy could be divided into two main schools of thought: those that argue in favor of dividend irrelevance and those that argue in favor of relevance of dividend payments in determining the firm's stock price.

MM argued that investors are indifferent between dividends and capital gains; therefore, the dividend distribution does not affect shareholders' wealth. However, it is hard to support the theory under the market imperfection due to the fact that it is based on the set of assumptions of perfect market and rational investors.

Taking into account various market imperfections (such as taxes, agency problem, transactions costs etc.), a lot of theories that show the relevance of dividend policy on market return have been developed. Some of them suggest that high dividends increase share value ('bird-in-the-hand' theory), others – that low dividends increase share value (the tax preference theory). Informational content of dividends (signaling), the agency cost theory, and the clientele effects also argue in favor of dividend relevance.

However, it was presumed that the tax preference theory that indicates that different taxation of dividends and capital gains influences investors' preferences

and hence stock prices, is not applicable for the Polish stock exchange. The suggestion has been made based on the information that there is no difference between Polish integrated long-term capital gains tax and integrated dividend tax rate. Therefore, taking into account taxes, the investors' behavior in response to dividend announcements of the companies listed on the WSE could be indifferent.

The literature review indicates that the current research is different from the recent studies conducted. There is no similar research that investigates the dividend announcement impact on the WSE market return separately for banking sector – the most valuable sector on the Polish market (49 per cent of the whole market capitalization). Moreover, the current investigation included the sample of the latest period including the financial crisis.

Current paper investigated the reaction of the stock market to the announcements of cash dividend payments of the companies belonging to the banking sector and listed on the Warsaw Stock Exchange. The effect of informational contest of dividend announcements on the Polish stock return has been examined with the help of event study methodology using abnormal return (AR) and cumulative abnormal return (CAR). In order to estimate the market and industry returns for the current empirical research, WIG and MSCI Europe Banks Indices, respectively, have been chosen. The data sample included 43 dividend announcements for six banks listed on the Warsaw Stock Exchange over ten years starting from 2006.

The analysis of the Polish market showed that the impact of the global financial crisis on the Warsaw Stock Exchange occurred between November 2007 and January 2009 and was accompanied by 57.95 per cent drop of WIG Index and by 72.24 per cent for WIGBANK Index. Moreover, the dividend payout ratio for the banking sector of WSE significantly declined in 2008; it was more than six times lower compared to the ratio for 20 largest companies of WSE (WIG20 Index). However, already in 2009, the dividend payout ratio for both Indices was approximately the same and equal to more than 46 per cent. Over the last years, the tendency of increased dividend payouts is observed for both sectors.

The empirical results showed statistically significant CAR after the dividend announcement for about 65 percent of announced events over the years analyzed. Consequently, the study confirms that investors recognize the informational content of dividend announcements; and, as a result, the impact on the Polish market returns for the banking sector occurs.

Moreover, it was indicated that during the financial crisis almost all of the dividend initiations were accompanied by significant stock market returns, the sign of which directly depended on the direction of the dividend change (positive/

negative dividend changes led to positive/negative market returns). On the other hand, the last four years analyzed show the decrease of investors' response to dividend declarations as only 45 per cent of all announcements during this period had statistically significant CAR. This conclusion highlighted the dividend policy importance for investors during the crisis period when the shareholders treated dividend payments as additional source of information regarding future companies' perspective.

In addition, the tendency to direct relationship between dividend change direction and stock market return is observed in slightly more than half of dividend initiations: positive dividend changes lead to positive market returns, and the announcement of negative dividend change negatively affects the stock prices. This indicates that dividend increase is treated by the investor as a good news about company's future performance which is complained with positive movement of stock prices; and vice versa, the decrease of dividend payments through the shareholder's expectation lead to negative market returns.

The impact of dividend announcements on the stock returns is important knowledge for financial managers as it shows that their dividend policy decisions influence the company's value. Especially, the dividend relevance is strong during the crisis. The policy makers could provide the information to their shareholders about future perspectives with the help of dividend announcements which will affect the stock prices.

The study fills up the lack of empirical studies regarding the investor's behavior in the response to the dividend announcement for Polish market during the last ten years. The main hypothesis of the current investigation has been confirmed which means a significant reaction of investors to changes in the dividend policy of the companies. The dividend relevance has been proved based on the sample of banking dividend announcements of the WSE for the 2006–2015 period.

Further research could also cover the investor's reaction to omitted dividend payment that was expected to be paid but was not declared by the board of directors, and compare the effect of banking dividend announcements with other Polish market sectors.

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APPENDIX 1. Implication of Corporate finance theories in prediction of the dividend announcement effect on stock prices.

Theory	Dividend announcement	Expected effect on stock prices
Dividend irrelevance theory (Miller and Modigliani)	Increase / Decrease	No effect
"Bird-in-the-hand" theory	Increase	Positive effect (investor's uncertainty decrease)
	Decrease	Negative effect (investor's uncertainty increased)
The Walter Model	Increase	Negative effect for growth company (internal rate is bigger than the opportunity cost of capital); No effect for company with equal investment rate of return and the cost of capital; Positive effect for declining company (internal rate less than opportunity cost of capital)
	Decrease	Positive effect for growth company; No effect for company with equal investment rate of return and the cost of capital; Negative effect for declining company
Agency cost theory	Decrease	Negative effect (threat of fund's misuse by manager's)
Free cash flow hypothesis	Increase	Positive effect (behavior of managers is in line with the owners' interest)
	Decrease	Negative effect (threat of free cash flow investment in projects with negative net present value)
The tax preference theory	Increase	Negative effect
	Decrease	Positive effect (the low dividend payout ratio supports the cost of capital to be lower due to higher taxes for dividends)
The dividend-signaling hypothesis / Information content hypothesis	Increase	Positive effect (signals increase if present or future cash flow; signal for permanent or long-term growth of expected earnings)
	Decrease	Negative effect

APPENDIX 2. Summary of studies on dividend announcement effect.

Author	Country of investigation	Number of firms	Number of events	Period of investigation	Results
Docking and Koch (2005)			4336	1962–1997	Lower dividends lead to stronger market price decrease when previously market prices showed upward tendency
Gurgul and Majdosz (2005)	Poland	45		Jan 2000–Jun 2004	Statistically significant positive abnormal return on day +1.
Vazakidis and Athianos (2010)	Greece	60		2004-2008	Positive reaction over the pre-announcement period and negative reaction over the post- announcement period
Bayezid and Chowdhury (2010)	Bangladesh	25		Jan-Sep 2008	No effect of dividend announcement on stock prices
Sharma (2011)	India	133	1188	1997–2007	No significant abnormal market returns surrounding the dividend declaration day
Viera (2011)	UK, France, Portugal		4442	2004–2010	Negative market response on the announcement of dividend increase for companies with higher growth opportunities and historically lower dividend changes
Miletic (2011)	Croatia	41	56	2007–2009	Statistically significant effect of dividend announcement on stock prices
Pan, Tang, Tan, and Zhu (2014)	China	1475	12538	1993–2006	No significant market reaction for cash dividend announcements
Nezum and Jashim Uddin (2014)	Bangladesh	28		2000–2013	No effect of dividend announcement on stock prices
Abdullah Al Masum (2014)	Bangladesh	30		2007–2011	Significantly positive effect of dividend policy on market return

Author	Country of investigation	Number of firms	Number of events	Period of investigation	Results
Kadıoğlu, Telçeken and Öcal (2015)	Turkey	118	902	2003–2015	Significantly negative relationship between cash dividends announcement and the market reaction
Szomko (2015)	Poland		816	1997–2010	Significant positive reaction to the irregular payouts, initiation and the increase in payouts. Negative reaction for the resumption and decrease in dividend payouts
Zia and Kochan (2015)	US	98		2003–2013	Negative market reaction on dividend cuts

APPENDIX 3. CAR Estimation Results for Bank Handlowy w Warszawie (BHW).

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
24mar2006	0.0036	0.3441	0.0036	0.3922	0.0036	0.4019											
27mar2006	-0.0014	-0.1312	-0.0014	-0.1496	-0.0014	-0.1533	-0.0049	-0.6336	**-0.0049*****	-5.6535	**-0.0049*****	-6.8491					
28mar2006	-0.007	-0.676	-0.007	-0.7705	-0.007	-0.7895	-0.0106	-1.3598	**-0.0106*****	-12.1324	**-0.0106*****	-14.6981	-0.0057	-0.7043	**-0.0057*****	-22.6098	-0.0057
29mar2006	-0.013	-1.2449	-0.013	-1.4189			**-0.0165****	-2.1181	**-0.0165*****	-18.8979			-0.0116	-1.4398	**-0.0116*****	-46.2196	
30mar2006	-0.0107	-1.0285					**-0.0143***	-1.8297					-0.0093	-1.1601			
12mar2007	0.001	0.0275	0.001	0.0269	0.001	0.0293											
13mar2007	-0.0057	-0.1622	-0.0057	-0.1585	-0.0057	-0.1727	-0.0067	-0.1943	-0.0067	-0.1885	-0.0057	-0.1727					
14mar2007	-0.041	-1.1636	-0.041	-1.1368	-0.041	-1.2388	-0.042	-1.2196	-0.042	-1.183	-0.041	-1.2388	-0.0353	-0.9774	-0.0353	-0.8887	-0.0353
15mar2007	-0.0366	-1.0382	-0.0366	-1.0144			-0.0375	-1.0913	-0.0375	-1.0585			-0.0309	-0.855	-0.0309	-0.7775	
16mar2007	-0.041	-1.1639					-0.042	-1.22					0	-0.9778			
09apr2010	0.0102	0.3238	0.0102	0.315	0.0102	0.3122											
12apr2010	-0.0135	-0.4295	-0.0135	-0.4177	-0.0135	-0.414	-0.0237	-0.7991	-0.0237	-0.7534	-0.0237	-0.7591					
13apr2010	-0.006	-0.1904	-0.006	-0.1852	-0.006	-0.1836	-0.0162	-0.5455	-0.0162	-0.5144	-0.0162	-0.5182	0.0075	0.7361	**0.0075*****	16.1523	0.0075
14apr2010	0.002	0.0634	0.002	0.0617			-0.0082	-0.2763	-0.0082	-0.2605			0.0155	1.5179	**0.0155*****	33.3045	
15apr2010	-0.0005	-0.0146					-0.0106	-0.359					0.013	1.2776			

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
04mar2011	-0.0144	-0.5201	-0.0144	-0.5041	-0.0144	-0.5443											
07mar2011	0.0002	0.0073	0.0002	0.0071	0.0002	0.0077	0.0146	0.7129	0.0146	0.6845	0.0146	0.6402					
08mar2011	-0.008	-0.2891	-0.008	-0.2802	-0.008	-0.3026	0.0064	0.3122	0.0064	0.2998	0.0064	0.2804	-0.0082	-0.4867	-0.0082	-0.4217	-0.0082
09mar2011	0.0032	0.1175	0.0032	0.1139			0.0176	0.8618	0.0176	0.8274			0.003	0.1809	0.003	0.1567	
10mar2011	0.0053	0.19					0.0196	0.9598					0.005	0.3			
09mar2012	0.0042	0.1562	0.0042	0.1567	0.0042	0.2945											
12mar2012	-0.0079	-0.295	-0.0079	-0.2959	-0.0079	-0.5563	-0.0121	-0.4369	-0.0121	-0.4284	-0.0121	-1.2159					
13mar2012	-0.0101	-0.3751	-0.0101	-0.3763	-0.0101	-0.7073	-0.0143	-0.5145	-0.0143	-0.5045	-0.0143	-1.4318	-0.0022	-0.1131	-0.0022	-0.098	-0.0022
14mar2012	0.0097	0.3622	0.0097	0.3633			0.0055	0.1994	0.0055	0.1956			0.0176	0.9278	0.0176	0.804	
15mar2012	0.0192	0.7143					0.015	0.5405					0.0271	1.425			
08mar2013	0.0067	0.3851	0.0067	0.3747	0.0067	0.3636											
11mar2013	0.0251	1.446	0.0251	1.4071	0.0251	1.3655	0.0184	1.0283	0.0184	0.9736	0.0184	0.8693					
12mar2013	0.0224	1.2865	0.0224	1.2519	0.0224	1.2149	0.0157	0.8738	0.0157	0.8272	0.0157	0.7386	-0.0028	-0.4059	-0.0028	-0.4626	-0.0028
13mar2013	0.0256	1.4718	0.0256	1.4322			0.0189	1.0534	0.0189	0.9973			0.0004	0.0657	0.0004	0.0749	
14mar2013	**0.0302***	1.7401					0.0235	1.3135					0.0051	0.7486			

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
04mar2014	-0.0129	-0.6216	-0.0129	-0.6123	-0.0129	-0.5803											
05mar2014	-0.0107	-0.5175	-0.0107	-0.5097	-0.0107	-0.483	0.0022	0.2242	0.0022	0.2122	0.0022	0.2064					
06mar2014	0.0019	0.0913	0.0019	0.09	0.0019	0.0853	0.0148	1.5342	0.0148	1.4525	0.0148	1.4128	0.0126	1.4079	0.0126	1.2795	0.0126
07mar2014	0.0047	0.2243	0.0047	0.221			**0.0176***	1.8205	**0.0176***	1.7235			**0.0154***	1.7155	0.0154	1.5591	
10mar2014	0.0096	0.4641					**0.0225*****	2.3364					**0.0204****	2.27			
06mar2015	-0.005	-0.1458	-0.005	-0.1933	-0.005	-0.2244											
09mar2015	0.0154	0.4433	0.0154	0.5878	0.0154	0.6824	0.0204	0.6504	**0.0204***	1.8907	**0.0204*****	2.4866					
10mar2015	0.0275	0.7956	0.0275	1.0548	0.0275	1.2245	0.0326	1.0393	**0.0326*****	3.021	**0.0326*****	3.9731	0.0122	0.3954	0.0122	0.9978	0.0122
12mar2015	0.0413	1.1928	**0.052****	1.9898			**0.057***	1.8178	**0.057*****	5.2841			0.0366	1.1871	**0.0366*****	2.9957	
11mar2015	0.052	1.5007					0.0463	1.4778					0.0259	0.8413			

Notes: The event window length is shown as [-a;+b], where *a* stands for the number of days before the event, and *b* – for the number of days after the event. The stars marked next to CAR indicate statistical significance: *** – at 1% level; ** – at 5% level; * – at 10% level.

APPENDIX 4. CAR Estimation Results for Bank Zachodni w Warszawie (BZW).

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
20feb2006	0.0091	0.1924	0.0091	0.2211	0.0091	0.2149											
21feb2006	0.0004	0.0077	0.0004	0.0089	0.0004	0.0086	-0.0087	-0.1935	-0.0087	-0.2587	-0.0087	-0.2863					
22feb2006	-0.0389	-0.822	-0.0389	-0.9447	-0.0389	-0.9181	-0.048	-1.0629	-0.048	-1.4212	-0.048	-1.5726	-0.0393	-0.8197	-0.0393	-1.082	-0.0393
23feb2006	-0.0419	-0.8849	-0.0419	-1.017			-0.051	-1.1288	-0.051	-1.5093			-0.0423	-0.8819	-0.0423	-1.164	
24feb2006	-0.0269	-0.5673					-0.036	-0.7961					-0.0272	-0.5681			
20feb2007	-0.0125	-0.2549	-0.0125	-0.3806	-0.0125	-0.3592											
21feb2007	-0.0256	-0.5208	-0.0256	-0.7776	-0.0256	-0.7338	-0.0131	-0.2588	-0.0131	-0.4233	-0.0131	-0.3776					
22feb2007	-0.0734	-1.4909	**-0.0734****	-2.2259	**-0.0734****	-2.1006	-0.0608	-1.2031	**-0.0608****	-1.9677	**-0.0608***	-1.7552	-0.0478	-0.8967	**-0.0478***	-1.9301	-0.0478
23feb2007	**-0.0964***	-1.9584	**-0.0964*****	-2.9238			**-0.0838***	-1.6582	**-0.0838*****	-2.7119			-0.0708	-1.3289	**-0.0708*****	-2.8602	
26feb2007	**-0.083***	-1.6868					-0.0705	-1.3938					-0.0574	-1.0778			
26feb2010	-0.001	-0.0425	-0.001	-0.0469	-0.0212	-1.1767											
01mar2010	-0.0212	-0.9486	-0.0212	-1.0455	-0.025	-1.3916	-0.0202	-0.9479	-0.0202	-0.9886	-0.0202	-1.2363					
02mar2010	-0.025	-1.1218	-0.025	-1.2365	-0.001	-0.0528	-0.0241	-1.1291	-0.0241	-1.1776	-0.0241	-1.4727	-0.0039	-0.2319	-0.0039	-0.5877	-0.0039
03mar2010	-0.0223	-1.0003	-0.0223	-1.1025			-0.0214	-1.002	-0.0214	-1.045			-0.0012	-0.0692	-0.0012	-0.1754	
04mar2010	**-0.0386***	-1.7282					**-0.0376***	-1.7636					-0.0174	-1.0436			

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
28feb2011	-0.0072	-0.6432	-0.0072	-0.6229	-0.0072	-0.681											
01mar2011	-0.0024	-0.2117	-0.0024	-0.205	-0.0024	-0.2242	0.0049	0.4669	0.0049	0.4426	0.0049	0.6181					
02mar2011	-0.0054	-0.4783	-0.0054	-0.4632	-0.0054	-0.5064	0.0019	0.1784	0.0019	0.1691	0.0019	0.2362	-0.003	-0.6432	-0.003	-0.6412	-0.003
03mar2011	-0.0131	-1.1606	-0.0131	-1.124			-0.0058	-0.5599	-0.0058	-0.5308			**-0.0107****	-2.2896	**-0.0107****	-2.2823	
04mar2011	-0.0161	-1.4298					-0.0089	-0.8513					**-0.0137*****	-2.9393			
28feb2012	0.0033	0.2515	0.0033	0.4073	0.0033	0.8158											
29feb2012	0.003	0.2294	0.003	0.3716	0.003	0.7442	-0.0003	-0.0219	-0.0003	-0.0494	-0.0003	-0.3648					
01mar2012	0.0019	0.1469	0.0019	0.2379	0.0019	0.4765	-0.0014	-0.1039	-0.0014	-0.2342	**-0.0014***	-1.7296	-0.0011	-0.0775	-0.0011	-0.1997	-0.0011
02mar2012	-0.0046	-0.3489	-0.0046	-0.5651			-0.0079	-0.5964	-0.0079	-1.3445			-0.0076	-0.5428	-0.0076	-1.3995	
05mar2012	0.0048	0.3654					0.0015	0.1131					0.0018	0.1276			
06mar2013	-0.0014	-0.0303	-0.0014	-0.0844	-0.0014	-0.0797											
07mar2013	-0.0228	-0.4824	-0.0228	-1.343	-0.0228	-1.2673	-0.0214	-0.4388	**-0.0214*****	-2.7465	**-0.0214*****	-4.3603					
08mar2013	-0.0393	-0.8309	**-0.0393****	-2.313	**-0.0393****	-2.1825	-0.0378	-0.777	**-0.0378*****	-4.8631	**-0.0378*****	-7.7206	-0.0165	-0.3583	**-0.0165*****	-4.0458	-0.0165
11mar2013	-0.0517	-1.0932	**-0.0517*****	-3.0432			-0.0502	-1.0316	**-0.0502*****	-6.4566			-0.0289	-0.628	**-0.0289*****	-7.0915	
12mar2013	-0.0203	-0.4289					-0.0188	-0.3868					0.0025	0.0551			

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
28feb2014	0.0193	0.3584	0.0193	0.4388	0.0193	0.4945											
03mar2014	-0.0065	-0.1201	-0.0065	-0.147	-0.0065	-0.1657	-0.0258	-0.5375	-0.0258	-1.091	-0.0258	-1.1273					
04mar2014	-0.0094	-0.1741	-0.0094	-0.2131	-0.0094	-0.2402	-0.0287	-0.5982	-0.0287	-1.2141	-0.0287	-1.2545	-0.0029	-0.0658	-0.0029	-0.1196	-0.0029
05mar2014	-0.0366	-0.6795	-0.0366	-0.832			-0.056	-1.166	**-0.056*****	-2.3666			-0.0302	-0.6814	-0.0302	-1.2393	
06mar2014	-0.0128	-0.2372					-0.0321	-0.6692					-0.0063	-0.1427			

Notes: The event window length is shown as [-a;+b], where *a* stands for the number of days before the event, and *b* – for the number of days after the event. The stars marked next to CAR indicate statistical significance: ***– at 1% level; **– at 5% level; *– at 10% level.

APPENDIX 5. CAR Estimation Results for Bank Handlowy w Warszawie Slaski SA (ING).

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
29mar2006	-0.0074	-0.269	-0.0074	-0.2692	-0.0074	-1.0704											
30mar2006	-0.0071	-0.257	-0.0071	-0.2573	-0.0071	-1.0228	0.0003	0.0135	0.0003	0.0129	0.0003	0.0589					
31mar2006	-0.0124	-0.4483	-0.0124	-0.4488	**-0.0124***	-1.7842	-0.005	-0.2027	-0.005	-0.1933	-0.005	-0.8823	-0.0053	-0.2181	-0.0053	-0.189	-0.0053
03apr2006	0.0103	0.3727	0.0103	0.3731			0.0177	0.7254	0.0177	0.6918			0.0174	0.7178	0.0174	0.6221	
04apr2006	0.0199	0.7196					0.0273	1.1175					0.027	1.1131			
19apr2007	0.0003	0.0129	0.0003	0.0406	0.0003	0.0511											
20apr2007	0.0034	0.1543	0.0034	0.4861	0.0034	0.6115	0.0031	0.146	0.0031	0.4514	0.0031	0.8718					
23apr2007	0.01	0.4578	0.01	1.4426	**0.01***	1.8147	0.0097	0.4593	0.0097	1.4205	**0.0097*****	2.7436	0.0066	0.3098	0.0066	0.8407	0.0066
24apr2007	0.0087	0.4003	0.0087	1.2613			0.0085	0.4	0.0085	1.2369			0.0054	0.2511	0.0054	0.6814	
25apr2007	0.0317	1.452					0.0314	1.4857					0.0284	1.3244			
08apr2008	-0.0057	-0.1791	-0.0057	-0.174	-0.0057	-0.6779											
09apr2008	-0.0144	-0.4505	-0.0144	-0.4375	**-0.0144***	-1.7049	-0.0087	-0.2839	-0.0087	-0.2678	-0.0087	-0.9107					
10apr2008	-0.0136	-0.4239	-0.0136	-0.4117	-0.0136	-1.6042	-0.0078	-0.2561	-0.0078	-0.2415	-0.0078	-0.8214	0.0009	0.0348	0.0009	0.032	0.0009
11apr2008	0.0139	0.4339	0.0139	0.4214			0.0196	0.6414	0.0196	0.6048			0.0283	1.1576	0.0283	1.064	
14apr2008	0.0198	0.62					0.0256	0.8361					0.0342	1.4012			

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
14feb2011	0.0044	0.1943	0.0044	0.2024	0.0044	0.3872											
15feb2011	-0.0018	-0.0789	-0.0018	-0.0822	-0.0018	-0.1572	-0.0062	-0.3261	-0.0062	-0.4071	**-0.0062*****	-4.3572					
16feb2011	-0.0094	-0.4148	-0.0094	-0.4321	-0.0094	-0.8266	-0.0138	-0.7269	-0.0138	-0.9076	**-0.0138*****	-9.7144	-0.0076	-0.3847	-0.0076	-0.5269	-0.0076
17feb2011	-0.0314	-1.3884	-0.0314	-1.4463			-0.0358*	-1.8887	**-0.0358*****	-2.3582			-0.0296	-1.4995	**-0.0296****	-2.0537	
18feb2011	-0.0309	-1.3666					-0.0353*	-1.8627					-0.0291	-1.4745			
28feb2014	-0.0186	-0.8407	-0.0186	-0.9475	-0.0186	-1.006											
03mar2014	-0.0159	-0.7168	-0.0159	-0.8079	-0.0159	-0.8578	0.0027	0.2415	0.0027	0.2881	0.0027	0.2697					
04mar2014	-0.0233	-1.0523	-0.0233	-1.1859	-0.0233	-1.2592	-0.0047	-0.4124	-0.0047	-0.4921	-0.0047	-0.4606	-0.0074	-0.6369	-0.0074	-0.8539	-0.0074
05mar2014	-0.022	-0.9949	-0.022	-1.1212			-0.0034	-0.3005	-0.0034	-0.3586			-0.0062	-0.528	-0.0062	-0.7078	
06mar2014	-0.0162	-0.7319					0.0024	0.2121					-0.0003	-0.0286			
20feb2015	-0.012	-0.8411	-0.012	-0.8333	-0.012	-0.802											
23feb2015	-0.0199	-1.4	-0.0199	-1.387	-0.0199	-1.335	-0.008	-0.7772	-0.008	-0.7336	-0.008	-0.6361					
24feb2015	-0.0154	-1.0802	-0.0154	-1.0702	-0.0154	-1.0301	-0.0034	-0.3325	-0.0034	-0.3139	-0.0034	-0.2722	0.0046	0.7108	0.0046	0.6709	0.0046
25feb2015	-0.0176	-1.2371	-0.0176	-1.2256			-0.0056	-0.5506	-0.0056	-0.5197			0.0023	0.3622	0.0023	0.3418	
26feb2015	-0.019	-1.3345					-0.007	-0.6861					0.0009	0.1456			

Notes: The event window length is shown as [-a;+b], where *a* stands for the number of days before the event, and *b* – for the number of days after the event. The stars marked next to CAR indicate statistical significance: ***– at 1% level; **– at 5% level; *– at 10% level.

APPENDIX 6. CAR Estimation Results for Bank Millenium SA (MIL).

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
17jan2006	-0.0239	-0.3885	-0.0239	-0.4877	-0.0239	-0.7751											
18jan2006	-0.0362	-0.5878	-0.0362	-0.738	-0.0362	-1.1727	-0.0123	-0.2066	-0.0123	-0.3264	-0.0123	-0.5257					
19jan2006	-0.0252	-0.408	-0.0252	-0.5122	-0.0252	-0.814	-0.0012	-0.0202	-0.0012	-0.032	-0.0012	-0.0515	0.0111	0.1806	0.0111	0.5527	0.0111
20jan2006	0.006	0.0972	0.006	0.122			0.0299	0.5034	0.0299	0.7952			0.0422	0.6881	**0.0422****	2.1053	
23jan2006	-0.0318	-0.5151					-0.0078	-0.1313					0.0045	0.073			
22mar2007	0.0457	0.7044	0.0457	0.7433	0.0457	0.7086											
23mar2007	0.0276	0.4255	0.0276	0.4489	0.0276	0.428	-0.0181	-0.4256	-0.0181	-1.4529	**-0.0181*****	-13.1963					
26mar2007	0.0081	0.1254	0.0081	0.1323	0.0081	0.1261	-0.0376	-0.8834	**-0.0376*****	-3.0158	**-0.0376*****	-27.3926	-0.0195	-0.4777	-0.0195	-1.4878	-0.0195
27mar2007	0.0018	0.027	0.0018	0.0285			-0.044	-1.0335	**-0.044*****	-3.5283			-0.0259	-0.6343	**-0.0259****	-1.9757	
28mar2007	0.028	0.4312					-0.0177	-0.4169					0.0004	0.009			
06mar2008	-0.0634	-0.6567	-0.0634	-0.6811	-0.0634	-0.6965											
07mar2008	-0.0736	-0.7615	-0.0736	-0.7897	-0.0736	-0.8076	-0.0101	-0.2223	-0.0101	-0.2203	-0.0101	-0.1952					
10mar2008	-0.0318	-0.3295	-0.0318	-0.3417	-0.0318	-0.3495	0.0316	0.6946	0.0316	0.6882	0.0316	0.6097	**0.0417*****	2.9608	**0.0417*****	2.5663	0.0417
11mar2008	-0.0064	-0.0659	-0.0064	-0.0683			0.0571	1.2542	0.0571	1.2428			**0.0672*****	4.7679	**0.0672*****	4.1325	
12mar2008	0.0267	0.276					**0.0901****	1.9799					**0.1002*****	7.1113			

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
29mar2011	-0.004	-0.1911	-0.004	-0.2196	-0.004	-0.3936											
30mar2011	0.0027	0.1288	0.0027	0.1481	0.0027	0.2654	0.0068	0.3128	0.0068	0.3466	0.0068	0.703					
31mar2011	-0.0001	-0.0063	-0.0001	-0.0072	-0.0001	-0.013	0.0039	0.1807	0.0039	0.2002	0.0039	0.406	-0.0029	-0.1424	-0.0029	-0.2226	-0.0029
01apr2011	-0.0159	-0.7485	-0.0159	-0.8602			-0.0118	-0.5451	-0.0118	-0.604			-0.0186	-0.9245	-0.0186	-1.4453	
04apr2011	-0.0084	-0.3971					-0.0044	-0.2014					-0.0111	-0.5541			
31jan2014	0.0065	0.091	0.0065	0.0921	0.0065	0.0938											
03feb2014	0.0671	0.9335	0.0671	0.9447	0.0671	0.9621	0.0605	0.835	0.0605	0.8453	0.0605	0.7691					
04feb2014	0.0489	0.6806	0.0489	0.6888	0.0489	0.7014	0.0424	0.5843	0.0424	0.5916	0.0424	0.5382	-0.0182	-0.3358	-0.0182	-0.2964	-0.0182
05feb2014	0.0921	1.281	0.0921	1.2964			0.0855	1.1795	0.0855	1.194			0.025	0.4615	0.025	0.4073	
06feb2014	0.0942	1.3102					0.0876	1.2084					0.0271	0.5003			

Notes: The event window length is shown as [-a;+b], where *a* stands for the number of days before the event, and *b* – for the number of days after the event. The stars marked next to CAR indicate statistical significance: ***– at 1% level; **– at 5% level; *– at 10% level.

APPENDIX 7. CAR Estimation Results for Bank Polska Kasa Opieki SA (PEO).

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
21mar2006	-0.0023	-0.0779	-0.0023	-0.1613	-0.0023	-0.165											
22mar2006	-0.0105	-0.362	-0.0105	-0.7493	-0.0105	-0.7666	-0.0083	-0.2817	-0.0083	-0.5544	-0.0083	-0.5259					
23mar2006	-0.0031	-0.1059	-0.0031	-0.2191	-0.0031	-0.2242	-0.0008	-0.0277	-0.0008	-0.0545	-0.0008	-0.0517	0.0074	0.2885	0.0074	0.5347	0.0074
24mar2006	-0.0096	-0.3288	-0.0096	-0.6805			-0.0073	-0.2488	-0.0073	-0.4896			0.001	0.0374	0.001	0.0694	
27mar2006	0.0137	0.4728					0.016	0.5461					0.0243	0.9403			
14mar2007	-0.0386	-0.7909	-0.0386	-0.8145	-0.0386	-0.795											
15mar2007	-0.0374	-0.7672	-0.0374	-0.7901	-0.0374	-0.7712	0.0012	0.0878	0.0012	0.09	0.0012	0.0807					
16mar2007	-0.0219	-0.4494	-0.0219	-0.4628	-0.0219	-0.4517	0.0167	1.2629	0.0167	1.2942	0.0167	1.1615	**0.0155***	1.6519	0.0155	1.4696	0.0155
19mar2007	-0.017	-0.3479	-0.017	-0.3582			0.0216	1.6384	**0.0216***	1.679			**0.0205****	2.1797	**0.0205***	1.9391	
20mar2007	-0.0046	-0.0942					**0.034*****	2.5764					**0.0328*****	3.4983			
11mar2010	0.0088	0.5376	0.0088	0.546	0.0088	0.613											
12mar2010	0.001	0.0632	0.001	0.0642	0.001	0.0721	-0.0078	-0.9997	-0.0078	-0.9582	-0.0078	-1					
15mar2010	0.001	0.0632	0.001	0.0642	0.001	0.0721	-0.0078	-0.9997	-0.0078	-0.9582	-0.0078	-1	0	0	0	0	0
16mar2010	-0.0074	-0.4502	-0.0074	-0.4573			**-0.0161****	-2.0817	**-0.0161****	-1.9953			-0.0084	-1.088	-0.0084	-1	
17mar2010	-0.0141	-0.865					**-0.0229*****	-2.9558					**-0.0152****	-1.967			

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
07mar2011	-0.0071	-0.2652	-0.0071	-0.2568	-0.0071	-0.2557											
08mar2011	0.009	0.335	0.009	0.3244	0.009	0.3229	0.0161	0.6199	0.0161	0.5866	0.0161	0.5219					
09mar2011	-0.0058	-0.2148	-0.0058	-0.208	-0.0058	-0.207	0.0014	0.0521	0.0014	0.0493	0.0014	0.0438	-0.0148	-0.7632	-0.0148	-0.679	-0.0148
10mar2011	0.0012	0.0451	0.0012	0.0437			0.0083	0.3205	0.0083	0.3033			-0.0078	-0.4024	-0.0078	-0.358	
11mar2011	0.0018	0.0651					0.0089	0.3411					-0.0073	-0.3747			
24apr2012	0.0104	0.2303	0.0104	0.2959	0.0104	0.2806											
25apr2012	-0.002	-0.0436	-0.002	-0.0561	-0.002	-0.0532	-0.0124	-0.2689	-0.0124	-0.3319	-0.0124	-0.2893					
26apr2012	0.0284	0.6296	0.0284	0.8089	0.0284	0.767	0.018	0.3919	0.018	0.4836	0.018	0.4215	0.0304	0.6958	**0.0304***	1.7689	0.0304
27apr2012	0.0416	0.9222	0.0416	1.1849			0.0312	0.6791	0.0312	0.8381			0.0436	0.9982	**0.0436*****	2.5378	
30apr2012	0.0223	0.4954					0.012	0.2602					0.0243	0.5572			
13mar2013	0.0052	0.1718	0.0052	0.1684	0.0052	0.2316											
14mar2013	0.0057	0.1871	0.0057	0.1835	0.0057	0.2523	0.0005	0.0149	0.0005	0.0142	0.0005	0.019					
15mar2013	0.0307	1.0097	0.0307	0.9901	0.0307	1.3616	0.0255	0.8131	0.0255	0.7749	0.0255	1.038	0.025	0.7578	0.025	0.6696	0.025
18mar2013	0.0183	0.6038	0.0183	0.5921			0.0131	0.4192	0.0131	0.3996			0.0127	0.3839	0.0127	0.3392	
19mar2013	0.0181	0.597					0.0129	0.4126					0.0125	0.3776			

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
07mar2014	0.0014	0.0857	0.0014	0.0997	0.0014	0.1643											
10mar2014	0.0124	0.7608	0.0124	0.885	0.0124	1.4584	0.011	0.6546	0.011	0.7626	**0.011*****	3.6139					
11mar2014	0.0203	1.249	0.0203	1.4531	**0.0203*****	2.3944	0.0189	1.1281	0.0189	1.3142	**0.0189*****	6.2277	0.0079	0.618	0.0079	0.6285	0.0079
12mar2014	0.0156	0.9604	0.0156	1.1173			0.0142	0.8482	0.0142	0.9881			0.0032	0.2527	0.0032	0.2569	
13mar2014	0.0105	0.6462					0.0091	0.5435					-0.0019	-0.1451			
09feb2015	0.0064	0.2562	0.0064	0.2496	0.0064	0.27											
10feb2015	0.0028	0.1143	0.0028	0.1114	0.0028	0.1205	-0.0035	-0.1523	-0.0035	-0.1484	-0.0035	-0.2071					
11feb2015	-0.0177	-0.7125	-0.0177	-0.6942	-0.0177	-0.7509	-0.024	-1.0399	-0.024	-1.0131	-0.024	-1.4142	-0.0205	-0.8378	-0.0205	-0.7569	-0.0205
12feb2015	-0.0111	-0.4469	-0.0111	-0.4354			-0.0174	-0.7547	-0.0174	-0.7353			-0.0139	-0.5687	-0.0139	-0.5137	
13feb2015	-0.0111	-0.4466					-0.0174	-0.7545					-0.0139	-0.5684			

Notes: The event window length is shown as [-a;+b], where *a* stands for the number of days before the event, and *b* – for the number of days after the event. The stars marked next to CAR indicate statistical significance: ***– at 1% level; **– at 5% level; *– at 10% level.

APPENDIX 8. CAR Estimation Results for Powszechna Kasa Oszczednosci Bank Polski SA (PKO).

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
12apr2006	0.0001	0.0022	0.0001	0.0026	0.0001	0.0039											
13apr2006	-0.0168	-0.4099	-0.0168	-0.5016	-0.0168	-0.7335	-0.0169	-0.4141	-0.0169	-0.4809	-0.0169	-0.6483					
18apr2006	-0.0076	-0.1864	-0.0076	-0.2281	-0.0076	-0.3335	-0.0077	-0.1895	-0.0077	-0.22	-0.0077	-0.2966	0.0091	0.5213	0.0091	0.6594	0.0091
19apr2006	0.0154	0.3761	0.0154	0.4603			0.0153	0.3758	0.0153	0.4364			**0.0321***	1.8332	**0.0321****	2.3188	
20apr2006	0.0442	1.0817					0.0441	1.0848					**0.061*****	3.4786			
21mar2007	0.0343	0.7736	0.0343	0.7496	0.0343	0.7231											
22mar2007	0.0271	0.61	0.0271	0.591	0.0271	0.5701	-0.0073	-0.4475	-0.0073	-0.6875	-0.0073	-0.7162					
23mar2007	0.0097	0.2179	0.0097	0.2112	0.0097	0.2037	-0.0247	-1.5197	**-0.0247*****	-2.335	**-0.0247*****	-2.4324	-0.0174	-1.0109	-0.0174	-1.5906	-0.0174
26mar2007	0.0032	0.0723	0.0032	0.0701			**-0.0311***	-1.9178	**-0.0311*****	-2.9468			-0.0239	-1.3863	**-0.0239****	-2.1813	
27mar2007	0.0057	0.1273					**-0.0287***	-1.7675					-0.0214	-1.2446			
07apr2008	0.0109	0.4219	0.0109	0.4599	0.0109	0.5985											
08apr2008	0.0038	0.1485	0.0038	0.1619	0.0038	0.2107	-0.0071	-0.2843	-0.0071	-0.3384	-0.0071	-0.3827					
09apr2008	0.0153	0.5895	0.0153	0.6426	0.0153	0.8361	0.0043	0.1742	0.0043	0.2074	0.0043	0.2346	0.0114	0.4865	0.0114	0.503	0.0114
10apr2008	0.004	0.1537	0.004	0.1675			-0.0069	-0.2789	-0.0069	-0.332			0.0001	0.0057	0.0001	0.0059	
11apr2008	0.0169	0.6515					0.0059	0.2387					0.013	0.5548			

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
04jun2009	0.0035	0.055	0.0035	0.0654	0.0035	0.1119											
05jun2009	0.0056	0.0875	0.0056	0.104	0.0056	0.178	0.0021	0.0329	0.0021	0.0438	0.0021	0.0678					
08jun2009	-0.023	-0.3597	-0.023	-0.4278	-0.023	-0.7322	-0.0265	-0.4199	-0.0265	-0.5592	-0.0265	-0.8645	-0.0286	-0.4586	-0.0286	-1.1944	-0.0286
09jun2009	-0.0755	-1.1814	-0.0755	-1.405			-0.079	-1.252	**-0.079***	-1.6672			-0.0811	-1.3011	**-0.0811*****	-3.3887	
10jun2009	-0.0573	-0.8961					-0.0608	-0.9631					-0.0629	-1.0086			
09apr2010	-0.0124	-0.5606	-0.0124	-0.5836	-0.0124	-0.9908											
12apr2010	-0.013	-0.5898	-0.013	-0.614	-0.013	-1.0425	-0.0006	-0.0483	-0.0006	-0.0476	-0.0006	-0.4605					
13apr2010	-0.0123	-0.5556	-0.0123	-0.5784	-0.0123	-0.982	0.0001	0.0083	0.0001	0.0082	0.0001	0.079	0.0008	0.0678	0.0008	0.0591	0.0008
14apr2010	0.0013	0.0581	0.0013	0.0605			0.0137	1.0232	0.0137	1.0082			0.0143	1.2826	0.0143	1.1182	
15apr2010	0.0097	0.4401					**0.0221***	1.655					**0.0227****	2.0389			
02may2011	-0.0072	-0.2984	-0.0072	-0.3579	-0.0072	-0.3594											
04may2011	0.0061	0.255	0.0061	0.3059	0.0061	0.3071	0.0133	0.6014	0.0133	0.9801	**0.0133*****	12.3681					
05may2011	0.0184	0.7637	0.0184	0.916	0.0184	0.9197	0.0256	1.1542	**0.0256***	1.881	**0.0256*****	23.7362	0.0123	0.6378	0.0123	0.9404	0.0123
06may2011	0.0176	0.7314	0.0176	0.8773			0.0248	1.1191	**0.0248***	1.8239			0.0115	0.5973	0.0115	0.8807	
09may2011	0.0078	0.3241					0.015	0.6765					0.0017	0.0867			

	[-2;+2]		[-2;+1]		[-2;+0]		[-1;+2]		[-1;+1]		[-1;+0]		[-0;+2]		[-0;+1]		[-0;+0]
date	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**	**ttest**	**CAR**
07may2012	-0.0091	-0.2674	-0.0091	-0.2589	-0.0091	-0.2852											
08may2012	-0.0106	-0.3116	-0.0106	-0.3018	-0.0106	-0.3324	-0.0015	-0.0458	-0.0015	-0.0434	-0.0015	-0.0549					
09may2012	0.0153	0.4499	0.0153	0.4357	0.0153	0.4799	0.0243	0.7435	0.0243	0.7039	0.0243	0.8903	0.0258	0.7572	0.0258	0.6647	0.0258
10may2012	0.0022	0.0658	0.0022	0.0637			0.0113	0.3454	0.0113	0.3269			0.0128	0.3753	0.0128	0.3294	
11may2012	0.0031	0.0899					0.0121	0.3703					0.0136	0.3992			
15apr2013	0.0101	0.2998	0.0101	0.3953	0.0101	0.3966											
17apr2013	0.0266	0.7869	0.0266	1.0375	0.0266	1.041	0.0165	0.4912	0.0165	0.6128	0.0165	0.5855					
18apr2013	0.0149	0.442	0.0149	0.5828	0.0149	0.5847	0.0048	0.1434	0.0048	0.1789	0.0048	0.1709	-0.0117	-0.4209	-0.0117	-0.4588	-0.0117
19apr2013	0.0287	0.8489	0.0287	1.1192			0.0186	0.5537	0.0186	0.6908			0.0021	0.0756	0.0021	0.0824	
22apr2013	0.0129	0.3824					0.0028	0.0833					-0.0137	-0.4937			
25apr2014	-0.0124	-0.7718	-0.0124	-0.7569	-0.0124	-0.714											
28apr2014	-0.0168	-1.0445	-0.0168	-1.0242	-0.0168	-0.9662	-0.0044	-0.3675	-0.0044	-0.3944	-0.0044	-0.3678					
29apr2014	-0.0092	-0.5759	-0.0092	-0.5647	-0.0092	-0.5327	0.0031	0.2642	0.0031	0.2835	0.0031	0.2644	0.0075	0.6366	0.0075	0.7473	0.0075
30apr2014	-0.0118	-0.7343	-0.0118	-0.7201			0.0006	0.0506	0.0006	0.0543			-0.0005	-0.043	0.005	0.4946	
02may2014	-0.0173	-1.0762					-0.0049	-0.4102					0.005	0.4213			

Notes: The event window length is shown as [-a;+b], where *a* stands for the number of days before the event, and *b* – for the number of days after the event.The stars marked next to CAR indicate statistical significance: ***– at 1% level; **– at 5% level; *– at 10% level.