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Occurrence of Calendar Anomalies in Dividend Companies – the Case of Quarter-of-the-Year Effect

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Abstract

Theoretical background: The efficient-market hypothesis (EMH) states that share prices immediately and fully reflect all information available on the market, so stock investors are not able to "beat the market" in the long term. Since stock exchanges are not fully efficient, there are numerous exceptions to EMH, called market anomalies (seasonal anomalies, fundamental anomalies, etc.). The occurrence of such anomalies enables stock investors to achieve excess market returns. Therefore, market anomalies are of particular interest to them. However, there are no studies on "beating the market" in the long term by dividend investing. Research to date has focused mainly on the short-term response of the capital market to dividend announcements.

Purpose of the article: The purpose of this paper is to examine whether by dividend investing stock investor is able to "beat the market" on quarterly basis, i.e. achieve excess market returns in some quarters of the year. In order to conduct the research, the following hypothesis was formulated: The average rates of return on the dividend index are higher in the third quarter of the calendar year than the average rates of return on other indices.

Research methods: The study was carried out in the period between 2012 and 2019 on the Warsaw Stock Exchange (WSE) using rates of return on income indices (i.e. WIG, WIGdiv, WIG20TR, WIG30TR, mWIG40TR and sWIG80TR). The main method used for the calculation was Kruskal–Wallis *H* test.
Main findings: Average returns on examined indices were negative in the second quarter of the year. Our finding is consistent with the so-called holiday effect. The highest rates of return occurred in the third quarter, except for small and medium companies. In these cases, the highest returns were observed in the first quarter). The study conducted with the use of the Kruskal–Wallis *H* test showed that the null hypothesis, stating that the cases come from the same population, cannot be rejected.

Introduction

The efficient-market hypothesis (EMH) states that assets prices reflect all available information. As a result, there should be no ability to achieve excess market return on investment in the long term. However, practice shows that stock investors manage to "beat the market" because of numerous exceptions to EMH, called market anomalies. Most studies deal with seasonal anomalies that have been observed on capital markets for many decades (Wachtel, 1942). Research on this problem is usually conducted on a monthly basis and focuses on finding recurring patterns of return on shares or stock indices (Lisicki, 2018, p. 288; Borowski, 2019, p. 23). Some of them relate to changes in the market price of dividend shares. However, these studies focus primarily on the capital market's response to dividend payout or dividend policy changes (Czapniewski & Kubiak, 2018, p. 243). Moreover, studies are usually carried out in the short term and include an event window of several dozen days around the dividend announcement. Therefore, it seems reasonable to conduct research on achieving excess market return on dividend shares in the long term. Conducting such research requires the use of a quarterly basis to find recurring patterns throughout the year. The quarter approach is justified for dividend companies, as the dividend payout is a seasonal process. In the first quarter, investors are waiting for financial results, in the second one – for the decision of general meeting of shareholders about profit distribution, in the third one – they receive dividend, and in the fourth, quarter most companies have already paid out dividends.

The study is a contribution to the scientific discussion on the occurrence of derogation from the efficient market hypothesis. Its purpose is to examine whether by dividend investing stock investor is able to "beat the market" on quarterly basis, i.e. achieve excess market returns in some quarters of the year. Therefore, the distribution of quarterly rates of return on the WIGdiv index was examined against the background returns of other indices. Achieving the purpose of the study required finding the answers to the research questions: what are the average rates of return on the WIGdiv index in subsequent quarters of the calendar year compared to the rates of return on other stock indices? Finding the answer to this question is especially important for stock investors interested in achieving the highest total shareholder return on dividend investing. They do not only expect to receive dividend, but also strive to achieve excess capital gain.

Literature review

On global capital markets there have been observed many exceptions to the efficient-market hypothesis. These exceptions are known as market anomalies. Among them, we should indicate fundamental anomalies (i.e. anomalies based on company characteristics), anomalies related to the information announcements, market under- and overreaction, as well as calendar (seasonal) anomalies.

The most frequently indicated fundamental anomalies include those related to the company's size (excess market returns are achieved in the case of companies with low capitalization), amount of the price-to-earnings ratio (excess market returns are observed on shares of the companies with a below-average P/E ratio), growth potential (investments in companies with low book-to-market value ratios allow to realize significantly higher abnormal returns). Among the authors dealing with these problems are, among others, Wolski and Rychter (2009), Czapiewski (2011), Czekaj (2014). Moreover, there are some anomalies related to the low price effect (Zaremba & Żmudziński, 2014), the momentum effect (Szyszka, 2006; Sekuła, 2016), as well as price anomalies related to initial public offering (Cornanic & Novak, 2013), mergers and acquisitions (Perepeczo, 2009), and dividend policy (Brzeszczyński & Gajdka, 2009).

Calendar anomalies are associated with such a distribution of rates of return during the year in which regularly recurring patterns are observed. These regularity should not occur in an efficient market. The basic seasonal anomalies are:

a) the January effect observed in the 1940s by Wachtel (1942, p. 184). This effect is based on an increase in market share prices at the beginning of the year. According to Szyszka (2009, p. 166), this effect occurs in connection with the shares sale for tax reasons (i.e. deduction of loss from the stock investor's income). In connection with the sale of shares that have depreciated, supply pressure arises, which results in a further decline in share prices at the end of the year. However, at the beginning of the new year, investors decide to buy back shares that became undervalued in December. As a result, shares price increases. The January effect was confirmed, among others, in Great Britain and Australia, where excess market rates of return were observed in the month following the month in which income tax was paid (i.e. in April and July, respectively) (Czerwonka & Gorlewski, 2012, p. 155). One of the latest research on a global scale was conducted by Perez (2018, p. 50), who studied 106 indexes in 86 countries and proved that while this effect can still be observed in some markets, it is decreasing globally over time. On the WSE, however, the research results were not conclusive and depended on the adopted period and research method. And so, *inter alia*, Keller (2016, p. 21) did not observe the January effect on the WSE, Karaszkiewicz and Staniec (2017, p. 73) proved that the January effect did not occur, Borowski (2019, p. 23) proved the occurrence of the January effect, Lewandowska (2017, p. 17) indicated that this is only a random and occasional phenomenon, and

Lisicki (2018, p. 288) proved its occurrence only in the construction sector and IT sector,

b) the day-of-the-week effect (weekend effect). This effect consists in the occurrence of permanent and repeatable differences in rates of return on subsequent days of the week. It was observed for the first time in the 1970s on the US market, where the average rates of return between Friday and Monday closing of the trading session were significantly lower compared to the average rates of return achieved on other days of the week (Constantinides, Harris, & Stulz, 2003, p. 939). The occurrence of this anomaly is explained in the literature by revealing negative information about the company usually on Friday afternoons (Szyszka, 2009, p. 170). In recent years, this seasonal anomaly has been the focus of research mainly in developing countries. Aziz and Anzari (2015, p. 99) proved that the weekend effect is non-existent in India (the highest rates of return were observed on Monday and Wednesday). Gayakera, Yalcina and Berument (2020, p. 55) provide empirical evidence that as the overnight interest rates decreases, the day-of-the-week effect decreases. On the WSE, these issues were of interest of Borowski (2013, p. 49), who proved that rates of return were the highest on Mondays. Czerwonka and Gorlewski (2012, p. 174) showed that the highest rates of return are achieved on Fridays, Grotowski (2008, p. 62) observed the highest returns on Thursdays and Fridays, Landmesser (2006, p. 187) and Fiszeder and Kożuchowska (2015, p. 10) proved that the highest rates of return occur on Mondays and Fridays. In turn, Harasim (2016, p. 24) did not confirm the occurrence of the day-of-the-week effect,

c) the turn-of-the-month effect which is the effect of relatively higher daily rates of return around the turn of the month, i.e. in the last days of the previous month and the first days of the next month. This anomaly is to be related to the fact that at the turn of the month employees receive remuneration for their work, part of which is allocated for the purchase of shares. Giovanis (2014, p. 43) argues that as a result, market share prices are rising,

d) the January barometer is a seasonal anomaly in which January rates of return are a forecast of rates of return for the upcoming calendar year. Research on the WSE, conducted by Borowski (2018, p. 5) and Marianowska, Szerszyńska and Szymański (2016, p. 35), do not confirm the occurrence of this calendar anomaly,

e) holiday related anomalies (e.g. sale of shares in May and taking a long position after the holidays, i.e. in October, holiday effect, "Santa Claus Rally"), seasonal anomalies associated with the phases of the moon (higher rates of return during the new moon, and lower at the full moon), unlucky dates (e.g. the thirteenth day of the month), etc. (Lizińska, 2018, p. 270).

Research methods

Research on the occurrence of quarterly anomalies was carried out on the Warsaw Stock Exchange in the years 2012–2019. Conducting the analysis required us to use quarterly rates of return on main indices (i.e. WIG, WIGdiv, WIG20TR, WIG30TR, mWIG40TR and sWIG80TR). The study included 32 quarters. The rates of return were obtained from Stooq.pl. We used Statistica software to conduct the analysis.

In order to achieve the main objective of the research, which was to examine whether by dividend investing stock investor is able to "beat the market" on quarterly basis, i.e. achieve excess market returns in some quarters of the year, the following hypothesis was formulated: The average rates of return on the dividend index are higher in the third quarter of the calendar year than the average rates of return on other stock indices.

Empirical verification of research hypotheses was carried out in two steps. In the first stage, the average quarterly returns on chosen indices were calculated. Then, because the assumptions of the analysis of variance were not met, we used Kruskal–Wallis *H* test to evaluate if *k* independent samples come from the same population (Stanisz, 2012, p. 386). The *H* statistic is given by the following formula (Stanisz, 2012, p. 373):

$$H = \frac{12}{n(n+1)} \sum_{i=1}^{k} \frac{T_i^2}{n_i} - 3(n+1)$$

where n_i is a number of observations; n is a sum of n_i; T_i means the sum of ranks in each sample. The obtained *H* statistic is divided by the value of *P* that is an adjustment defined by the formula (Stanisz, 2012, p. 373):

$$P = 1 - \frac{\sum (k^3 - k)}{n^3 - n}$$

where *k* is the number of measurements with the same tied rank.

Empirical results

Research on the distribution of quarterly rates of return on stock indices indicates the occurrence of certain seasonal anomalies. In the first quarter of the year, the average rates of return were positive for all examined indices in the years 2012–2019. The highest average rates of return were observed for the small companies index – sWIG80TR (7.44%) and medium companies index – mWIG40TR (5.45%), while the lowest one was for the dividend index – WIGdiv (1.75%). In the second quarter, average rates of return on all indices were negative and the lowest among four quar-

ters. The lowest value was observed for the WIGdiv index (-2.35%), and the highest – for the mWIG40TR index (-0.59%). In the third quarter, all average rates of return were positive again. The highest values were observed for mWIG40TR (5.30%), WIG (4.95%) and WIGdiv (4.69%), and the lowest – for sWIG80TR (2.04%). It is worth noting that in the third quarter, the average rates of return of all indices were higher than the average value. In the fourth quarter, the average rates of return declined but they were still positive. The only exception was the rate of return on the WIGdiv index, which was negative and amounted to -0.56%. Summing up, based on the data presented in Table 1, it should be noted that there are some quarterly anomalies on the WSE with negative returns in the second quarter and positive returns in the third quarter. This observation applies to all studied indices.

Table 1. Average quarterly rates of return on stock indices in 2012–2019 (%)

Quarter	Average quarterly rate of return on the stock index					
	WIG	WIGdiv	WIG20TR	WIG30TR	mWIG40TR	sWIG80TR
Q1	3.08	1.75	1.86	2.59	5.45	7.44
Q2	-1.68	-2.35	-1.41	-0.74	-0.59	-2.18
Q3	4.95	4.69	3.47	3.66	5.30	2.04
Q4	0.62	-0.56	0.88	0.82	1.02	0.71
Mean	-0.13	0.30	1.20	1.58	2.79	2.00

Source: Author's own study.

In order to verify the null hypothesis that the cases come from the same population, the Kruskal–Wallis *H* test was used. Our study showed that there is no reason to reject the null hypothesis. The *H*-ratio values were not statistically significant (see Table 2).

Table 2. Results of Kruskal–Wallis *H* test

Spec.	WIG	WIGdiv	WIG20TR	WIG30TR	mWIG40TR	sWIG80TR
Kruskal–Wallis *H* test						
H	4.048	5.196	2.392	3.119	3.707	5.497
p	0.256	0.158	0.495	0.374	0.295	0.139
p-value (multiple comparisons)						
Q1 vs. Q2	0.499	0.499	0.719	0.226	0.445	0.123
Q1 vs. Q3	0.876	0.320	0.267	0.659	0.560	0.896
Q1 vs. Q4	0.773	0.933	0.480	0.746	0.279	0.901
Q2 vs. Q3	0.241	0.241	0.439	0.599	0.226	0.772
Q2 vs. Q4	0.699	0.978	0.692	0.479	0.506	0.879
Q3 vs. Q4	0.899	0.754	0.746	0.219	0.719	0.741

Source: Author's own study.

Discussion

The obtained research results indicate the quarterly fluctuations in the average rates of return on stock indices. These fluctuations are proposed to be named the "quarter-of-the-year effect" due to the cyclical nature of their occurrence. In the first quarter, the examined rates of return were positive. This is in line with the literature, in particular with January effect (Borowski, 2019, p. 23). Growth in the stock market, which is observed at the beginning of the year, is explained, among others, by the re-purchase of shares that investors sold at the end of previous year due to tax optimization (Szyszka, 2009, p. 166). Moreover, the highest average rates of return achieved on the small companies index are explained by the occurrence of the so-called small companies effect. It has been proved that companies with smaller capitalization allow achieving relatively higher returns (Drew, Marsden, & Veeraraghavan, 2006, p. 135). In turn, negative returns in the second quarter may be related not only to investors' disappointment with the financial results published in the financial statements for the previous year, but may also be associated with an increased sale of shares before the holidays (Lizińska, 2018, p. 270) and higher demand for cash in that period. Increased sales can even lead to undervaluation of shares, and then to an increase in demand for them. Therefore, in the third quarter of the year, average rates of return on indices increase. In particular, this concerns the indices of medium and dividend companies. Due to the fact that companies pay out divined in this quarter of the year, the author of the study proposes to call it the "dividend seasonality effect" or the "third quarter effect". Then, in the fourth quarter, rates of return decline again. These results are consistent with the literature, which indicates that investors, in order to benefit from the January effect and being aware that in December stock prices may start rising, buy shares earlier and earlier, e.g. already in November (Czerwonka & Gorlewski, 2012, p. 172). Furthermore, in the case of dividend companies, the reason for decrease in rates of return may also be the fact that after dividend payout the share price no longer includes the right to dividend (Pieloch-Babiarz, 2014, p. 196). Therefore, the research confirmed the occurrence of the so-called end-of-the-year effect.

Conclusions

Research on seasonal anomalies on the WSE in the period between 2012 and 2019 showed the existence of certain regularities in the formation of average rates of return. Some fluctuations were observed when analysing the quarterly rates of return. In the first quarter of the year, average rates of return were positive and the highest for small and medium-sized companies. Rates of return were negative in the second quarter, then increased in the third quarter (the highest values were observed for mWIG40, WIG and WIGdiv) to decrease again in the fourth quarter (the lowest

and negative average rates were observed for the dividend companies index). Such rates of return are associated not only with calendar effects (i.e. January effect, holiday effect, "Santa Claus Rally", turn-of-the-year effect), but also with investors' reaction to information provided by the company (e.g. announcement of financial results, announcement of dividend and its payout).

Focusing on rates of return on the WIGdiv index, it should be noted that the highest average value was observed in the third quarter (it was higher than returns on WIG20TR, WIG30TR and sWIG80TR). However, it ought to be pointed out that dividend investing is not the only way to "beat the market" in the third quarter. Our research showed that investors could realize high (i.e. above average) returns on all analysed indices.

Our research results may have cognitive value for stock market investors. It should be emphasized, however, that they are not an investment recommendation. The calendar anomalies observed on the WSE concern only the analysed period and it is not known whether they will occur in the future. We recommend to extend the research to other anomalies (i.e. fundamental anomalies or anomalies related to market overreaction/underreaction). Furthermore, it is proposed to change the research period by dividing it into the years of crisis and economic recovery.

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