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Abstract

The subject of this analysis is the profitability of an investment strategy focused on high dividend yield stocks from the Polish stock market. We follow the idea from Visscher and Filbeck (2003) and construct portfolios of top ten highest dividend yielding companies, which are rebalanced annually over the period of 10 years from 1997 to 2007. Due to a relatively small number of dividend paying stocks in the analyzed sample, we made a selection from the pool of all companies listed on the Warsaw Stock Exchange (WSE). The results demonstrate that portfolios composed of the high dividend yield stocks were capable of beating the market, although this did not happen consistently over the entire period under analysis. Nevertheless, the average annual rate of return of the Top10 portfolios (consisting of the 10 highest dividend yield stocks) has been over two times larger than the return of the market index. The analysis of the most important risk-adjusted measures (Sharpe and Treynor indices) indicates that the Top10 portfolios have produced abnormally large returns compared to the market return; even after accounting for risk. We present our findings also in a broader context of their economic significance, following McQueen, Shields and Thorley (1997) and Visscher and Filbeck (2003), by including transaction costs and taxes. The results presented in this study have an important implication for investors regarding their investment horizon choices. The high dividend yield portfolios proved to be profitable and generated abnormal returns in the entire sample of 10 years but their performance varied in shorter sub-periods. Hence, investors should view this type of a strategy as a longer-term rather than a short-term investment.

Keywords: dividends, investment strategy, stock market, returns predictability, asset pricing, efficient markets theory.
JEL Classification: G15.

Introduction

The predictability of stock market returns has been investigated in the financial literature for over four decades (see, for example, Friend and Puckett (1964), Black and Scholes (1974), Fama and Schwert (1977), Keim and Stambaugh (1986), Fama and French (1988a), Bekaert and Hodrick (1992), Ferson and Harvey (1993), Solnik (1993), Barberis (2000), Malkiel (2004), Guo (2006) and Ang and Bekaert (2007)). Within this research stream, particular attention has been paid to dividend yield, which in many studies has been found to be an important predictor of future stock prices (e.g. Petit (1972), Aharony and Swary (1980), Fama and French (1988b), Hodrick (1992)). The relationship between stock prices and dividends has also been analyzed by Campbell and Shiller (1988), Goetzmann and Jorion (1993), Kothari and Shanken (1997) and recently by Goyal and Welch (2003) and Visscher and Filbeck (2003). Keppler (1991) implemented the data at the more aggregated level for average dividend yields for the individual countries and concluded that markets characterized by a higher dividend yield outperform those with lower average dividend yield.

Practitioners use various strategies based on the information about dividends paid out by publicly traded companies. One of the most popular strategies is to focus on the selection of high dividend yield stocks, which in the American market is commonly known as the "Dogs of Dow" strategy. Its application using the US market data was conducted by McQueen, Shields and Thorley (1997), who found that it outperformed the market throughout the entire period under analysis, although the results varied in individual sub-periods. Replication of this strategy for other markets, however, has contributed rather mixed results. For example, Visscher and Filbeck (2003) analyzed a similar strategy using the Canadian data and found that results beat the market; however, the investigation of the UK data by Filbeck and Visscher (1997) revealed that this strategy did not systematically outperform the market index.

Our study follows the idea from Visscher and Filbeck (2003), McQueen, Shields and Thorley (1997) and Filbeck and Visscher (1997). We analyze the strategy of investing in stocks based on their dividend yields for the data from the stock market in Poland. Due to a relatively small number of dividend paying companies in the Polish stock market, we made the selection from the pool of all companies listed on the Warsaw Stock Exchange (WSE).

The Polish stock market is particularly interesting for the investigation of dividend strategies because it is relatively new and there is little research in

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this area. One of the main reasons for such a limited scope of research into the Polish stock market, is that, as a financial instrument, stocks are a new investment opportunity that in fact did not exist in Poland before the 1990s due to the lack of the stock exchange. Poland is also a very fast growing market in terms of capitalization and number of listed companies. The Warsaw Stock Exchange is the biggest market in Central and Eastern Europe and currently ranks as a mid-sized European stock exchange (hence it can be viewed as the representative market for its region).

The analysis in this paper contributes to the existing finance literature about dividends and dividend yield portfolios by providing evidence about the profitability of dividend yield investment strategies. The presented empirical results from this new market may be used for comparisons with the findings for other markets and may contribute to the formulation of more general conclusions about the informational role of dividends based on the evidence from this new, emerging economy[1]. Our results support the hypothesis that the portfolios of high dividend yield stocks outperformed the market index, although they show that they did not do so systematically.

The paper is organized as follows: section 1 describes the methodology, section 2 presents empirical results, section 3 discusses the economic significance of the results, section 4 provides likely explanations of our findings, and finally, the last section concludes the paper.

1. High dividend yield portfolios

Our empirical investigation relies on the framework of analysis outlined in Visscher and Filbeck (2003). We calculate the returns of the portfolios composed of the highest dividend yielding stocks in the Polish stock market over the period from 1997 to 2007 (a total of 10 annual returns) and compare the obtained results with the performance of the Polish stock market index WIG, which is widely considered as a common benchmark for the overall market activity in Poland.

The portfolios of the 10 highest dividend yield stocks (called Top10 portfolios henceforth) were selected from the pool of all stocks listed on the Warsaw Stock Exchange and were rebalanced each year by revising the dividend yield indicators for all listed companies[2]. Because the WIG index contains dividends in its definition, the returns of Top10 portfolios also included dividends paid by the companies.

Similarly to Visscher and Filbeck (2003) we chose the middle of each year for the portfolio reconstruction to avoid any distortion of the results which might arise due to the year-end stock trading motivated by various tax or accounting related reasons. As a consequence, the rebalancing of portfolios takes place on the last trading day of June each year from 1997 to 2007. The respective monthly and annual returns of those portfolios are calculated for the period commencing in June 1997 and ending in June 2007.

In this study the 10-year period and the corresponding 5-year sub-periods were chosen to make our results comparable with those from other markets, e.g. Visscher and Filbeck (2003) and Filbeck and Visscher (1997).

The information about stock prices, market indices, dividends and dividend yields for all stocks listed on the Polish stock market was collected directly from the Warsaw Stock Exchange. The database spans from the beginning of the stock market in 1991 to 2007 and includes all the companies and their respective dividend yields.

The selection procedure of stocks entering the Top10 portfolios was as follows. On the last trading day every June we identified 10 stocks with the highest dividend yields. Those 10 companies entered the portfolio for the next 12-month period. All portfolios were equally weighted regardless of the value of the dividend yields of their constituent stocks. Each portfolio was held for one year until the following June, when a new ranking of stocks based on their new dividend yield ratios was constructed and the portfolio was rebalanced.

Similarly to Visscher and Filbeck (2003) we compared the returns of our Top10 portfolios with the returns of the benchmark index. We calculated the compound annual returns for the Top10 portfolios and the WIG for all ten individual years as well as the average annual compound returns for six 5-year periods and the entire 10-year period. The annual returns were determined using the *monthly* returns and

[1] Earlier study for the dividend strategy in the Polish market was conducted by Brzeszczyński and Gajdka (2007), however it concerned the selection of stocks characterized by *highest growth* of the dividend yield (not the *highest dividend yield* stocks).

[2] The related studies by McQueen, Shields and Thorley (1997), Filbeck and Visscher (1997) and Visscher and Filbeck (2003) relied on the selection of only large stocks belonging to the major blue–chip stocks indices in the investigated markets, such as DJIA, FTSE100 or TSE35. In case of the stock market in Poland the number of dividend paying stocks that were at the same time a part of the Polish blue–chip index WIG20 was not sufficient to construct Top10 portfolios for the Warsaw Stock Exchange data in the analyzed period of time. Hence, we made a selection from the entire market.

compounding them to obtain the *annual* returns values. Therefore for the 1-, 5- and 10-year periods we used 12, 60 and 120 monthly returns, respectively.

Finally, using a *t*-statistic we tested whether the returns of the dividend portfolios and the market index were significantly different. We also calculated the values of the Sharpe ratio and Treynor index for the Top10 portfolios and for the WIG index.

2. Results

Table 1 presents the annual compounded returns and values of the *t*-statistic based on the simulation of investment in high dividend yield portfolios selected from all stocks quoted on the Warsaw Stock Exchange in the entire investment horizon of 10 years from 1997 to 2007[1]. It shows that the Top10 portfolios have beaten the WIG index in five out of the ten individual years in the entire sample. The differences of returns are statistically significant in two sub-periods: 2002-2003 and 2003-2004. However for the 5-year horizons the results indicate that the high dividend yield portfolios were more successful in nearly all periods, i.e. in five out of six 5-year periods except for only the first one (from June 1997 to June 2002). The differences of returns are statistically significant in years 1999-2004 and 2002-2007[2].

The analysis of the entire data sample from 1997 to 2007 confirms that in the whole period under analysis the dividend portfolios performed considerably better than the market [3]. In the 10-year horizon the average annual return of the Top10 portfolios was over two times higher than the average annual return of the market (72.78% for Top10 portfolios *versus* 33.58% for the WIG index). The overall return achieved by the dividend portfolios was 727.82% while the WIG index gained only 335.76% in the same period of time. This finding can be attributed to the improving performance of the high dividend yield portfolios over time, especially to very high returns posted in years 2002-2004 and 2006-2007[4].

Table 1. Compound returns for Top10 portfolios (with dividends) and WIG index for single-year holding periods (1-year returns, June-to-June) and for multiple-year holding periods (5- and 10-year returns, June-to-June) in years 1997-2007

Single-year periods	Top10 portfolio	WIG	Difference	*t*-statistic
1997-1998	-3.98%	3.72%	-7.70%	-0.60
1998-1999	-8.17%	6.97%	-15.14%	-0.60
1999-2000	**20.41%**	**16.75%**	**3.66%**	**0.12**
2000-2001	**-16.32%**	**-29.00%**	**12.68%**	**0.65**
2001-2002	-14.51%	1.77%	-16.28%	-0.64
2002-2003	**66.27%**	**12.64%**	**53.63%**	**2.22 ****
2003-2004	**140.75%**	**49.80%**	**90.95%**	**1.92 ****
2004-2005	-3.16%	18.30%	-21.46%	-1.31
2005-2006	31.62%	43.46%	-11.84%	-0.22
2006-2007	**113.64%**	**62.57%**	**51.07%**	**1.26**
Multiple-year periods	Top10 portfolio	WIG	Difference	*t*-statistic
1997-2002	-4.81%	-1.28%	-3.53%	-0.59
1998-2003	**6.31%**	**0.33%**	**5.98%**	**0.31**
1999-2004	**48.95%**	**8.47%**	**40.48%**	**1.64 ***
2000-2005	**35.45%**	**8.85%**	**26.60%**	**1.21**
2001-2006	**67.22%**	**38.29%**	**28.93%**	**0.73**
2002-2007	**197.96%**	**73.11%**	**124.85%**	**1.67 ***
1997-2007	**72.78%**	**33.58%**	**39.20%**	**0.75**

Notes: ** – significant at the 0.05 level. * – significant at the 0.1 level. 1) The *t*-statistic was calculated based on the paired difference test. 2) Bold numbers indicate the years, when the Top10 portfolios outperformed the market index.

The values of the Sharpe ratios reported in Table 2 confirm these results. They indicate that Top10 portfolios beat the market in five out of six 5-year periods and were inferior to the market index only in 1997-2002. In the entire 10-year sample of 1997-2007, dividend yield portfolios performed considerably better than WIG.

Table 3 presents the values of the Treynor index. The results confirm the same pattern reported earlier for Tables 1 and 2. The Top10 portfolios beat the

[1] The composition of the Top10 portfolios varied considerably. More than half of stocks on average were replaced in the next year's portfolios compared with the previous year.

[2] It is worthwhile to note that the statistically significant results were obtained only when the Top10 portfolios outperformed the market, so the differences of returns were positive. There is no significance in any of the single–year or multiple–year periods when the portfolios achieved the result worse than the market index.

[3] We selected stocks for the portfolios from the broad market, so we also investigated the possibility that the dividend yield effects could have been accompanied by the size effects. We checked this by eliminating small stocks from the portfolios. The results varied depending on the size criteria used for the stocks selection and on the number of stocks excluded from the portfolios. However the general tendency was that the portfolios returns were decreasing when small companies were removed from the portfolios. Hence, we conclude that the dividend yield effects and the size effects may have been interrelated, yet the analysis of the size effect itself was not the main aim of this research and we did not investigate it in detail. The main goal of this study was the analysis of overall profitability of high dividend yield portfolios (based solely on the dividend yield indicator) and comparisons with the market.

[4] We also performed a comparison of the portfolios results with the blue–chip index WIG20 (which does not include dividends in its definition). In order to do that we calculated the returns for the portfolios without dividends. The results and overall conclusions were very similar. The Top10 portfolios still considerably outperformed the market in the entire sample from 1997 to 2007. The annual average returns of Top10 portfolios (without dividends) and the WIG20 index were 54.04% and 15.22%, respectively.

market in most of the 5-year periods and in the entire 10-year sample[1].

Table 2. Sharpe ratios for Top10 portfolios and WIG index (1997-2007).

Period	Top10 portfolio	WIG
Single-year holding periods		
1997-1998	-0.98	-0.38
1998-1999	-0.63	0.07
1999-2000	**0.27**	**0.16**
2000-2001	**-1.91**	**-2.04**
2001-2002	-1.69	-0.20
2002-2003	**2.16**	**0.40**
2003-2004	**2.83**	**1.36**
2004-2005	-1.00	0.81
2005-2006	0.94	1.77
2006-2007	**4.68**	**2.45**
Multiple-year holding periods		
1997-2002	-1.86	-0.85
1998-2003	**-0.38**	**-0.59**
1999-2004	**1.51**	**-0.02**
2000-2005	**1.33**	**0.11**
2001-2006	**2.33**	**1.75**
2002-2007	**4.22**	**3.05**
1997-2007	**1.80**	**0.99**

Notes: 1) The Sharpe ratio was calculated based on the formula used in Visscher and Filbeck (2003): $S = (d_1 / S_{d_1}) \cdot \sqrt{n}$, where d_1 is the mean monthly difference between the portfolio (or market) return and the risk-free return computed for n equal to 12, 60 or 120 *months*, respectively, and S_{d_1} is the sample standard deviation of the *monthly* differences of returns. The risk-free rate for the Polish market is the return of the 52-week Polish government Treasury bill (rf_t); its monthly value for each month t was obtained using the following formula: $\sqrt[12]{1+rf_t}-1$ (where rf_t is the risk-free annual return obtained for every month). The source of the risk-free rate data is Polish Ministry of Finance. 2) Bold numbers indicate the years, when the Top10 portfolios outperformed the market index.

Table 3. Treynor index values for Top10 portfolios and WIG index (1997-2007)

Period	Top10 portfolio	WIG	*Beta*
Multiple-year holding periods			
1997-2002	-3.56%	-0.96%	*0.42*
1998-2003	-0.80%	-0.62%	*0.41*
1999-2004	**2.65%**	**-0.02%**	*0.55*
2000-2005	**2.55%**	**0.10%**	*0.47*
2001-2006	**5.15%**	**1.46%**	*0.42*
2002-2007	**7.72%**	**2.33%**	*0.50*
1997-2007	**2.43%**	**0.69%**	*0.48*

Notes: 1) The Treynor index was calculated based on the formula: $T = d_1/\beta$, where d_1 is the mean monthly difference between the portfolio (or market) return and the risk-free return computed for n equal to 60 or 120 *months*, respectively, and β is the portfolio's beta (market beta is equal to 1). 2) Bold numbers indicate the years, when the Top10 portfolios outperformed the market index.

Analysis of the individual annual periods shows an interesting feature of the dividend portfolios: whenever they were inferior to the index, they incurred relatively small losses, but when they were beating the market, their return was considerably higher than the corresponding change of the market index. The average difference of annual returns in years when the dividend portfolios beat the market is +42.40% while the average difference of annual returns in years when the market index WIG outperformed the dividend portfolios is only -14.48%.

Table 4. Returns of the Top10 portfolio and the WIG index in years 1997-2007 calculated with different levels of transaction costs (0%, 0.5%, 1%, 1.5% and 2%)

	Transaction costs				
	0%	*0.5%*	*1%*	*1.5%*	*2%*
WIG	335.76%	316.83%	298.65%	281.17%	264.39%
Top10 portfolio	727.82%	692.89%	659.27%	626.93%	595.82%

3. Economic significance

Further to the above reported statistical findings, we followed McQueen, Shields and Thorley (1997) and Visscher and Filbeck (2003) and explored the question of the economic significance of our results. We did this by including transaction costs and taxes.

From the practitioners' point of view, the ultimate indication of the overall performance of any investment strategy compared to the market, including the one based on the high dividend yield portfolios analyzed in this study, is the rate of return for the entire 10-year investment horizon. Our findings prove that in the case of the Polish stock market the return of the Top10 portfolios was considerably higher than the corresponding market return. Following Visscher and Filbeck (2003) we assumed that the portfolio at the start of the investment period in June 1997 was worth 100,000 units of the domestic currency (Polish zloty, PLN) and then calculated its value after 10 years and 10 rebalancing operations. Table 4 shows the profits from the investment of 100,000 PLN in June 1997 and re-investment of the portfolio's wealth each year in new stocks from a new portfolio until June 2007. After 10 years this investment had grown to 827,823 PLN (or 727.82%). The increase of the WIG index in the same period of time was 335.76%, which corresponds to 435,759 PLN (starting from 100,000 PLN in 1997).

We extended this analysis by simulating trading costs connected with rebalancing all Top10

[1] In a few single-year periods the estimate of the beta parameter was not statistically significant, so we calculated the Treynor index for multiple–year periods only.

portfolios once a year at the following levels: 0.5%, 1%, 1.5% and 2% (round-trip fees). These rates correspond to the trading costs of various groups of investors and their respective transaction sizes (and also take into account the differences between traditional and internet trading)[1]. As can be seen in Table 4, the highest trading cost of 2% significantly reduced the obtained profits[2].

As in the study of McQueen, Shields and Thorley (1997), we broadened our investigation by including the capital gains tax from investment in stocks and the tax on dividends. We calculated the returns adjusted by those two taxes. Even after accounting for the highest levels of transaction costs the dividend portfolios results were still remarkably high and for all assumed levels of transaction costs (from 0% to 2%) they have clearly beaten the market by generating the returns roughly twice as high as the returns of the WIG index.

In summary, the investment results of the Top10 portfolios, although they varied in individual years, were consistently better than the market returns in all 5-year periods starting from the sub-period of 1998-2003; also after accounting for risk. This finding suggests that the selection of stocks based on their dividend yields should be viewed by investors as a long- term, rather than a short-term, investment strategy.

4. Discussion

The reasons why the high dividend portfolios returns have been higher than the market returns in the entire period under analysis can be possibly attributed to the following three factors related to the specific circumstances of the Polish capital market: (i) the relationship between the dividend yield and the risk-free rate, (ii) the increasing importance of institutional investors, (iii) the changing profitability of dividend portfolios depending on the market phases (bull *versus* bear market).

The first possible explanation why the high dividend yield portfolios have beaten the market in the analyzed period may be the relative attractiveness of the dividend yields compared with the risk-free rate of return for the Polish market. Until the year 2001 the risk-free rate in Polish market was *higher* than both the average dividend yield for the entire market and the average dividend yield for the Top10 portfolios. Therefore, stocks offering dividend yields lower than the risk-free rate were not viewed as attractive investments.

The high level of the risk-free rate in the 1990s for the Polish stock market was connected with the macro-economic transformation processes, mainly the persistence of high inflation after the so-called "shock therapy" program of the first democratic government in Poland in the early 1990s. High inflation has kept the Polish central bank's interest rates at high levels and also explains the risk-free rate offered by the government Treasury bills. However, the macroeconomic stabilization program has continually contributed to the reduction of inflation and interest rates fell dramatically from the level of 30% in the mid-1990s to less than 5% several years later. The introduction of income tax upon interest earned by individual investors in 2002 (levied also on income from the Treasury bills) additionally decreased the relative attractiveness of interest income compared to dividend income (which had been earlier subjected to taxation). At the same time, the companies listed on the Warsaw Stock Exchange started to offer increasingly higher dividend yields: from an average of 5.19% in June 1997 to a much greater 20.05% in June 2006 for the best (i.e. highest dividend paying) ten stocks composing the Top10 portfolios.

The differences between the dividend yield and the risk-free rate are one of the possible explanations for our results. A decreasing level of the risk-free rate and lower interest rates on bank deposits in Poland have triggered the movement of capital from bank accounts to the stock market. At the same time, increasing dividend yields of public companies have attracted the attention of investors. For instance, according to a popular belief frequently discussed in the local media, high dividend yields paid by Polish companies were one of the most important factors attracting foreign investment to the Poland capital market[3]. Furthermore, over the period of all the 10 years in our sample the Polish stock market's volatility significantly decreased, and this could be another amplifying reason why the strategy relying on dividend yield indicators may have become attractive in this market[4].

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[1] This data is based on the survey of brokers from the Polish market ("Maklerzy wabią graczy: Jak wybrać najlepsze biuro?", Gazeta Wyborcza, 8th November 2007).

[2] We also have looked at the portfolios results from the point of view of international investors and adjusted the results for the investment calculated in the USD by using the exchange rates from the beginning and the end of the analyzed period. If the same amount of 100,000 PLN was invested by exchanging USD into the Polish zlotys, the investor would have to spend 30,581 USD in 1997 (exchange rate of PLN/USD on the last trading days in June 1997 and in June 2007 was equal to 3.27 and 2.81, respectively). The profit in USD varies from 863.34% in the zero–cost scenario to 709.72% in case of the highest simulated cost of 2%. The results in USD are better than the ones obtained in the local currency due to a favorable change in the PLN/USD exchange rate in this period of time.

[3] See for example: "Zagraniczni właściciele otrzymują coraz więcej dywidend. Zyskiem trzeba się podzielić", Rzeczpospolita, 6th October 2005.

[4] The standard deviation of returns for the indices WIG and WIG20 at the beginning of the sample in the year 1997 was 9.23% and 9.76%, while at the end of the sample in the year 2007 it was 5.53% and 5.25%, respectively.

The second likely explanation of the good performance of dividend strategy may be attributed to the growing role of institutional investors in the Polish stock market after the pension system reform in Poland. This reform resulted in the emergence of big pension funds as the newest and most important investor group on the Polish capital market.

With regard to the effect of institutional investors, there is evidence in the existing finance literature that they may have a stabilizing impact on stock prices and that they push prices to fundamental values (e.g. Cohen, Gompers and Vuolteenaho (2002)). On the other hand, evidence also exists that individual investors exhibit herding behavior and tend to trade on such information as the data about market sentiment (e.g. Chan and Fong (2004)). Other studies, which support the hypothesis that institutions can stabilize prices, are: Lakonishok, Shleifer and Vishny (1992), Choe, Kho and Stulz (1999), Karolyi (2002) and Barber and Odean (2008). It is, therefore, quite likely that the entrance of institutional investors in the Polish stock market may have diminished the role of individuals and, at the same time, may have increased the role of institutions and the importance of fundamental information, such as that contained in the dividends.

The third possibility is the changing profitability of dividend portfolios depending on stock market phases. For example, Gombola and Liu (1993) present evidence that the performance of dividend portfolios coincides with bull and bear markets phases. Polish dividend portfolios outperformed the market index in five out of six multiple-year periods starting from 1998-2003 and were beaten by the market in only one period of 1997-2002. This may be related to Poland's accession to the European Union (EU) in May 2004 since when the economic growth has rapidly accelerated (however the bull market period on the Warsaw Stock Exchange, continuing until 2007, started even earlier, i.e. already in 2003).

The question of whether the explanations related to the risk-free rates, the impact of institutional investors or stock market phases can comprehensively justify the obtained results is an open one. It does, however, highlight an interesting new research direction for both the stock market in Poland and for other markets.

Conclusions

The findings of our analysis demonstrate that the portfolios composed of the best 10 highest dividend yield stocks have been able to beat the market in the entire 10-year period from 1997 to 2007, although they have not achieved this consistently. Nevertheless, the average annual rate of return of the Top10 portfolios was more than twice as high as the corresponding market return.

Three possible explanations for this finding could be: (i) the relative attractiveness of the dividends paid out by the Polish stock market companies compared to the level of the risk-free rate in Poland, (ii) the entrance of institutional investors, and (iii) the changing profitability of dividend portfolios depending on the market phases (bull *versus* bear market).

The results presented in this study may have important implications for investors regarding their investment horizon choices. High dividend yield portfolios have proven to be a profitable investment in the entire sample even though their returns varied considerably in shorter periods. Thus, our study adds new empirical evidence from Poland, which confirms the findings from some other markets that investors should view this type of a trading strategy as a longer-term, rather than a short-term investment.

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