Folia Oeconomica Stetinensia
Volume 22 (2022) Issue 2
DOI: 10.2478/foli-2022-0020 | 78–96
ISSN (print): 1730-4237 | ISSN (online): 1898-0198
www.wnus.edu.pl/fos

THE IMPACT OF MACROECONOMIC INDICATORS ON THE SHARE PRICES OF DIVIDEND COMPANIES – A COMPARATIVE ANALYSIS OF POLISH AND US ISSUERS FOR THE PERIOD 2016–2020

Bartłomiej Jabłoński, Ph.D. Eng

University of Economics in Katowice
College of Finance
Department of Investment
1 Maja 50, 40-287 Katowice
e-mail: bartlomiej.jablonski@ue.katowice.pl
ORCID: 0000-0002-9398-017X

Dorota Kika, Ph.D.

University of Economics in Katowice
College of Finance
Department of Investment
1 Maja 50, 40-287 Katowice
e-mail: dorota.kika@ue.katowice.pl
ORCID: 0000-0001-5628-4709

Received 22.03.2022, Revised 4.10.2022, Accepted 7.10.2022

Abstract

Research background: The aim of the article is to compare Polish and US dividend companies with potential growth with dividend companies with potential value, including in the period of economic turbulence caused by the pandemic, and to identify macroeconomic determinants that affect changes in the level of share prices of dividend companies with potential value listed on the stock exchange in Poland and the US. An analysis of the literature and international studies conducted allows us to identify inflation, gross domestic product (GDP), interest rate levels, exchange rate changes, and market P/E and P/BV ratios, as well as the PMI index, as the most important macroeconomic factors.
Purpose: The aim of the article was to present research on the impact of macroeconomic indicators on the prices of Polish and US shares of dividend companies, divided into shares with potential value and potential growth for the period 2016–2020. The research was enriched by analyzing the return rate on shares and the risk of the share prices of companies with potential value during the turbulence of the economy caused by the COVID-19 pandemic.

Research methodology: The study was conducted using the Spearman rank correlation coefficient and significance test for the Spearman rank correlation coefficient. A non-parametric *t*-test was carried out to check whether the estimated correlation is statistically significant.
Results: The research indicates that Polish and US dividend companies with potential value have lower average annual return rates than dividend companies with potential growth. Referring to the determinants of the share prices of US dividend companies with potential value, it was found that they are significantly determined by inflation and moderately determined by industrial production and GDP, as well as the P/BV ratio.
Novelty: The added and application value are the recommendations regarding the attractiveness of investing in Polish dividend companies with potential value as compared to companies from the US market.

Keywords: macroeconomic indicators, portfolio choice, return rate, dividend companies with potential value or growth, stock exchange, COVID-19 pandemic

JEL classification: E44, G11, G30, G35

Introduction

Those investors making long-term investments, the most common securities in their portfolios are shares of domestic and foreign issuers. The rate of return of such portfolios is determined by the potential gain on the disposal of the shares and the possible dividend income paid for the shares holding period. In the long term, it is particularly important to invest in issuers that pay regular dividends and generate a regular annual income for the investor. They belong to a group of companies known as dividend companies or dividend aristocrats. A. Williams and M. Miller (2013), based on their research, found that during the US financial market crisis (2001 and 2008), the dividend aristocrats' return rates were characterized by higher returns than the S&P 500 index. These results are also confirmed by the research conducted by M. Lichtenfeld (2015, p. 63). The average annual return rate of the S&P Dividend Aristocrats Index for the period from 2001 to 2011 was 7.1% while the S&P 500 Index generated only a 2.9% average annual return rate during that time. In addition, the standard deviation of dividend aristocrats amounted to 18.4 pp. and was lower than the same parameter calculated for the S&P 500 index at 21.3 pp. Also – according to M. Skousen (2011b, p. 146) – shares that pay dividends perform better in terms of financial results than shares that do not pay dividends. In turn, H. Rubin and C. Spaht II (2011, pp. 11–19) and P. Asquith with D.W. Mullins Jr. (1983, pp. 77–96) indicate that rising dividends received by investors provide an excellent hedge against declines in the value of securities portfolios. Research conducted by K.P. Fuller and M.A. Goldstein (2011,

pp. 457–473) confirm that differences in the behavior of share prices are particularly noticeable in the bear market.

The aim of the article is to compare Polish and US dividend companies with potential growth with dividend companies with potential value, including in the period of economic turbulence caused by the world wide pandemic, and to identify macroeconomic determinants that affect changes in the level of share prices of dividend companies with potential value listed on the stock exchange in Poland and the US. The US stock market was chosen out of the need to verify the results of research conducted for this market by R.A. Haugen (1999), M. Lichtenfeld (2015) and M. Skousen (2011b). The Polish stock market, on the other hand, was chosen to see if Polish dividend companies have similar characteristics as their US counterparts.

The research concerns two groups of dividend companies, which, according to the literature (1999, pp. 2–10), are divided – using the P/BV ratio – into companies with potential growth and those with potential value. Companies with a high P/BV, i.e. above 1, were classified in the first group, while companies with a low P/BV, i.e. below 1, were assigned to the second group.

It is worth mentioning that there are studies on the determinants of share prices (E.F. Fama, P.K. Naik and P. Padhi, A.V. Megaravalli and G. Sampagnaro, M. Romus, A. Rizga, M.R. Abdillah and N.B. Zakaria, A.K. Giri and J. Pooja) but they do not undertake comparisons detailing dividend companies, including companies with potential value and companies with potential growth. Also in the literature, there is a gap in the analysis of the differences and similarities of the shares of dividend companies with potential value for the Polish and US markets from the point of view of return rates and share price risk during the turbulence of the economy caused by the COVID-19 pandemic.

1. Literature review and research hypotheses development

Irrespective of whether a company is a dividend or non-dividend company, it is possible to identify micro- and macroeconomic determinants of changes in the level of its share price. A similar division applies to the determinants of dividend payments. In their own way, these factors also affect the actual opportunities for profit transfer to shareholders. However, studies often overlook groups of other factors that may influence both share price changes and dividend payments. These include market factors (market indicators such as P/E and P/BV ratios) and behavioral factors indicating market sentiment.

Taking into account the purpose of the article and the research, the authors reviewed the literature from the perspective of the macroeconomic determinants of share price changes and

dividend policy. The analysis of factors that simultaneously affect dividend payments and share price changes is of particular importance from the point of view of the capital market investor, as they determine the investor's rate of return. An analysis of the literature and international studies conducted allows us to identify inflation, gross domestic product (GDP), interest rate levels, exchange rate changes, and market P/E and P/BV ratios, as well as the PMI index, as the most important macroeconomic factors.

Inflation, i.e. an increase in the price level in the economy, leads to the deepening of changes in the value of money over time. Its high levels (double-digit annual price increases) and falling prices (deflation) are particularly dangerous for the economy and economic operators. H. Hazlitt points to the issuance of too much paper money as a reason for the occurrence of inflation in the economy (2007, p. 61). In turn, M. Skousen (2011, p. 318) cites universal cash balance, consumer spending, or monetary expansion occurring through credit markets as reasons standing behind inflation. Inflation can affect share prices by affecting future returns and the way investors discount those future returns. Equity market participants anticipate changes in real activity, so it appears that equity prices change inversely to inflation. This was confirmed by research conducted by E.F. Fama (1981, p. 545–565). In the research carried out by P.K. Naik and P. Padhi (2012, p. 25–44) on the impact of macroeconomic variables on the Indian stock market index (Sensex), the authors indicated that macroeconomic variables and stock market index are significantly correlated. It was observed that share prices correlate positively with money supply and industrial production, but negatively with inflation. Macroeconomic variables caused share price changes in the long term, but not in the short term. In turn, research conducted by A.V. Megaravalli and G. Sampagnaro (2018, pp. 1–14) on the Indian, Chinese, and Japanese equity markets for the period 2008–2016 showed a negative and insignificant impact of inflation on equity prices in the long run. Dividend companies operating in a high-inflation environment often suspend the distribution of financial result in order to transfer surplus funds to make investments in those assets that will preserve the real value of capital (Skousen, 2011b, p. 86). T. Basse and S. Reddemann (2011, pp. 33–64), on the basis of their research they found a stable long-term relationship between dividend payments and real economic activity and the price level expressed in inflation. In periods when inflation is low and imperceptible, a stable dividend policy means practically paying a fixed dividend every year. In turn, during periods of higher inflation, investors not only expect rising profits, but also change their attitude towards the notion of a stable dividend policy. It implies that dividends will grow at a rate roughly comparable to that of profit increase (Brigham, Houston, 2005, p. 201). Companies operating in

a high inflation[1] environment not only reduce their dividend levels, but also often stop paying dividends to shareholders. Companies try to reinvest the generated profits as quickly as possible so that as little as possible of the generated profit lost its real value. In addition, the real value of the dividend paid has been declining rapidly since the decision to pay it had been made. Therefore, during this period, companies increase their engagement with the assets necessary to continue operations.

Gross domestic product, as one of the basic measures of national income, describes the aggregate value of final goods and services produced over a period of a year in a given country. In their research, M. Romus, A. Rizga, M.R. Abdillah and N.B. Zakaria (2020, pp. 1–6) on the impact of gross domestic product (GDP) and Bank Indonesia's interest rate on the dividend policy of the real estate company sector, indicated that the GDP growth rate has a positive impact on company performance and on dividend policy. In contrast, the interest rate did not have a significant impact on the performance of the companies surveyed. A.K. Giri and J. Pooja (2017, pp. 61–78) conducted a study of the long and short-term relationship between the share price and a set of macroeconomic variables for the Indian economy using annual data from 1979 to 2014. The findings indicate that economic growth has a positive impact on share prices. In turn, in the studies of companies listed on the Warsaw Stock Exchange for the period 1996–2009 conducted by M. Kowerski (2011, pp. 129–131, 271–279) confirm that the economic situation measured by the dynamics of GDP changes in year $t - 1$ has a positive impact on decisions to pay dividends in year t. In particular, this applies to companies that are characterized by a good economic and financial situation. This relationship does not apply to companies with a worse than average economic and financial situation. In addition, during good economic times, many companies that have not previously paid dividends begin to pay them. Also, the results of international studies (Kowerski, 2011, p. 198), indicate that the higher the GDP growth rate, the higher the probability of dividend payments. In turn, research conducted by W. Dębski and I. Bujnowicz (2008, pp. 9–20) for the period 1994–2005 confirms that there is a strong correlation between variables describing financial market development and variables describing economic growth.

Studies conducted on the Indian, Chinese, and Japanese stock markets for the period 2008–2016 showed a significant dependence of share prices on the exchange rate (significant long-run impact) (Megaravalli, Sampagnaro, 2018, pp. 1–14). On the other hand, a study of the impact of various macroeconomic variables on share prices in Pakistan for the period 2000–2016 by J. Khan, I. Khan (2018, pp. 15–25) indicates the impact of money supply, exchange rate, and

[1] High inflation is defined as a double-digit annual increase in prices.

interest rate on share prices in the long-term. In the short-term, none of the macroeconomic determinants analyzed by the authors were identified as significantly affecting share prices. When nominal interest rates rise, this also encourages the investor to change the portfolio structure in favor of bonds and vice versa. As a result of the fall in demand, share prices are expected to fall as well. F. Modigliani and R.A. Cohn (1979, pp. 24–44) claim that the interest rate is one of the most important determinants of share prices. An increase in interest rates will increase the discount rate and – thus – negatively affect the value of the shares. Research on the impact of macroeconomic aggregates carried out by H.W. Akani and Y. Swenem in Nigeria for the period from 1981 to 2014 (2017, pp. 55–63) indicate their significant influence on dividend payments by manufacturing enterprises. Among other things, the authors pointed out the significant negative impact of the interest rate and the exchange rate on the dividend payout ratio. In turn, in their research, A.A. Muhammad and F. Khan (2018, pp. 111–121) noted the negative effect of interest rate, inflation rate, and GDP growth rate on the dividend payout ratio of textile companies during the years 2001–2017. The results indicate that inflation and the exchange rate have a positive impact on share prices. To the best of the authors' knowledge, the impact of the above variables on share prices for the European equity market has not been found in the literature.

In research on the determinants of share price changes and dividend payments, another group becomes apparent – psychological factors. These include the economic sentiment of entrepreneurs, which is significantly reflected in decisions on the distribution of generated profit. They are calculated using different methods and measures. Synthetic indicators calculated by e.g. the European Commission, the Institute of Economic Development of the Warsaw School of Economics or the PMI index can be indicated. The PMI index (in other words the Logistics Managers' Index of the Polish industrial sector, prepared by the research institute Markit Economics) is calculated on the basis of a monthly survey among the management staff of over 300 Polish enterprises. Changes in orders, production, employment, speed of delivery and stocks are assessed. A reading above 50 indicates an improvement as compared with the previous period, while a reading below this value indicates a deterioration of the present situation. Capital market investors who take the PMI index into account in their decisions use it to respectively overweight (PMI above 50) or underweight shares in their portfolios when this parameter falls below the level of 50. On the other hand, from the point of view of dividend payments, research conducted by M. Kowerski (2011, p. 308) shows that the better the economic sentiment in the June of a given year, the higher the probability of dividend payments in the same year.

The last of the determinants of share price changes and dividend policy discussed are the market ratios – P/E and P/BV. These parameters are calculated as the quotient of the market price of the entity's shares and the various figures contained in the financial statements published from time to time. The most commonly used market indicators include price/book value – P/BV and price/earnings – P/E. The value of the P/E ratio indicates the period after which an investor can expect a return on the capital invested in a company. In turn, the P/BV ratio shows the relationship between the market price of a company's shares and the value of the company's equity attributable to shareholders. The values of both indicators are also influenced by the situation on the capital market. In bull markets, companies are characterized by the high values of both ratios, meaning that they are overvalued as compared to their performance, and in slump periods, by low values, meaning that they are undervalued. However, it is worth adding that if the enterprise sector is a net debtor, in most tax systems inflation will lead to a faster increase in real earnings via interest rates, which – at the same time – justifies a higher P/E ratio. An increase in asset prices due to a greater increase in the money supply may mean that shares are priced at a higher P/E ratio (Lee, 2000, pp. 190–191). In their works, H. DeAngelo, L. DeAngelo, R.M. Stulz (2006) and H.A.N. Al-Malkawi (2008) used P/E and P/BV ratios to analyze the impact of investment projects on dividend policy. According to H.A.N Al-Malkawi, the P/E ratio quantifies the market assessment of future cash flows, so companies with high values of this ratio have greater investment opportunities than companies with low values. In turn, research conducted by R. Tuzimek (2013, p. 295) shows that companies with a negative P/E ratio (i.e. generating losses) that pay dividends are, contrary to economic principles, perceived positively, despite the fact that the payment of dividends will deplete equity, which will be reduced by generated losses anyway. H. DeAngelo, L. DeAngelo and R.M. Stulz (2006) claim that the higher the P/BV ratio of a company in the previous year, the higher the possible dividend will be in the base year. Moreover, the research conducted by M. Baker and J. Wurgler (2004, pp. 271–288) shows that companies with higher values of a P/BV ratio are more likely to pay dividends than those with low values of this parameter. What is more, during periods of high inflation, dividend companies' shares can be attractive to investors because dividend income is a real variable and investors receive dividends mostly adjusted for inflation (Lee, 2000, p. 192). E.F. Fama and K. French (1992, pp. 427–465) conducted a study on all shares listed on the New York Stock Exchange, the American Stock Exchange, and the over-the-counter market (Nasdaq) for the period 1963–1990, taking into account the relationship between the book value of equity and the market value of the share. Companies with a low P/BV ratio were characterized by the authors as companies with potential value, while entities characterized by its high level

as companies with potential growth. The results show that the average annual return rate for companies with potential value was 24.4% and for companies with potential growth, only 8%.

The presented national and international research results, despite their wide time span, thematic scope, and inclusion of different stock exchanges, do not refer to comparisons of only dividend companies with potential growth and value. They also do not take into account whether there are macroeconomic determinants that significantly affect the behavior of the share prices of dividend companies with potential value and how the performance of these companies behaves during a period of economic turbulence caused by the pandemic.

Based on the literature review and the defined research gaps, the following research hypotheses were formulated:

H_1: Polish and US dividend companies with potential value for the period 2016–2020 have higher average annual return rates than dividend companies with potential growth.

H_2: Polish and US dividend companies with potential value during the period of the turbulent economy in 2020 are characterized by a higher average annual return rate and lower risk than dividend companies with potential growth.

H_3: Macroeconomic factors such as industrial production, GDP, inflation, market P/BV ratio, and PMI index in 2016–2020 significantly determine the changes in share prices of dividend companies with potential value listed on the stock exchange in Poland and the US.

2. Sample selection and methodology

For the purpose of achieving the article's objective, the research covered companies listed on the Polish and US stock exchanges that regularly paid dividends between 2016 and 2020 and whose dividend payment policy went back to at least 2006. 52 companies from the Warsaw Stock Exchange were analyzed, namely: Asseco Business Solutions (ABS), ACAutogaz (ACG), Asseco Poland (ACP), Ambra (AMB), Aplisens (APN), Apator (APT), Aqua (AQU), Asseco South Eastern Europe (ASE), Atende (ATD), ATM Grupa (ATG), Budimex (BDX), Bank Handlowy w Warszawie (BHW), CCC (CCC), CEZ (CEZ), Firma Oponiarska Dębica (DBC), Dektra (DKR), Dom Development (DOM), ED Invest (EDI), Korporacja Gospodarcza Efekt (EFK), Elektrotim (ELT), Eurocash (EUR), Eurotel (ETL), Euro-Tax.pl (ETX), Ferro (FRO), Fabryka Sprzętu i Narzędzi Górniczych Fasing (FSG), Giełda Papierów Wartościowych w Warszawie (GPW), Przedsiębiorstwo Hydrauliki Siłowej Hydrotor (HDR), IFIRMA (IFI),

Introl (INL), KGHM (KGH), KRKA (KRK), Zakłady Tłuszczowe Kruszwica (KSW), Grupa Kęty (KTY), Lena Lighting (LEN), LPP (LPP), Neuca (NEU), Oponeo.pl (OPN), Bank Polska Kasa Opieki (PEO), PGS Software (PSW), Powszechny Zakład Ubezpieczeń (PZU), Fabryka Obrabiarek Rafamet (RAF), Silvano Fashion Group (SFG), Fabryka Farb i Lakierów Śnieżka (SKA), Sanok Rubber Company (SNK), Sonel (SON), Stalprofil (STF), Talex (TLX), Unibep (UNI), Wawel (WWL), WODKAN Przedsiębiorstwo Wodociągów i Kanalizacji (WOD), Grupa Azoty Zakłady Azotowe Puławy (ZAP), Grupa Żywiec (ZWC). In turn, for the US, companies included in the Dow Jones Industrial Average (DJIA) index and the dividend aristocrats of the S&P500[2] are included. As a result, 38 companies were selected, i.e. Abbott Laboratories (ABT), Archer-Daniels-Midland (ADM), Automatic Data Processing (ADP), American Express (AXP), Becton, Dickinson & Co. (BDX1), Caterpillar (CAT), Chevron (CVX), The Walt Disney (DIS), Dover (DOV), Consolidated Edison (ED), Emerson Electric (EMR), The Goldman Sachs Group (GS), W.W. Grainger (GWW), International Business Machines (IBM), Intel (INTC), Johnson & Johnson (JNJ), JPMorgan Chase & Co. (JPM), The Coca-Cola (KO), Leggett & Platt (LEG), Lowe's (LOW), 3M (MMM), Merck & Co. (MRK), Microsoft (MSFT), Nike (NKE), Pfizer (PFE), The Procter & Gamble (PG), PepsiCo (PEP), PPG Industries (PPG), Stanley Black & Decker (SWK), Target (TGT), The Travelers (TRV), UnitedHealth Group (UNH), Raytheon Technologies (RTX), Visa (V), Verizon (VZ), Walgreens Boots Alliance (WBA), Walmart (WMT), Exxon Mobil (XOM). Of the companies systematically paying dividends, the following were rejected: The Boeing Company, The Home Depot, McDonald's, Kimberly-Clark and S&P Global, as the P/BV ratios estimated for them in the next stage of the research reached extremely positive or negative values (e.g. Boeing – $P/BV_{2018} = 433.88$ or McDonald's – $P/BV_{2016} = -40.50$). In addition, Lowe's was omitted for 2019 and 2020 as the P/BV ratio significantly overstated the average and distorted the results. It is worth noting that the research included the extremely specific year of 2020, which was characterized by the spread of the global SARS-CoV-2 pandemic and its impact on the operation and dividend payments of individual companies.

The research was carried out in the following stages:

1. Stage one – selection of companies listed on the Polish and US stock exchanges that paid dividends continuously between 2016 and 2020.
2. Stage two – from the companies selected in stage one, identification of companies with potential value and growth and carrying out comparisons in terms of return rates and risk.

[2] Companies were selected on the basis of Dividend Aristocrats 1989–2020 list, https://www.suredividend.com/dividend-aristocrats-list (20.01.2021).

3. Stage three – analysis of changes in the share prices of Polish and US dividend companies with potential value in the period of economic turbulence in 2020.
4. Stage four – analysis of macroeconomic, market, and behavioral factors determining the share price movements of dividend companies with potential value.

3. The impact of macroeconomic determinants on the share prices of dividend companies – research results for the period 2016–2020

In order to select companies with potential value (portfolio 1) as well as companies with potential growth (portfolio 2), the P/BV ratio was analyzed. It was decided that companies with a low P/BV, i.e. below 1, would qualify for portfolio 1. In turn, companies with a high P/BV ratio, i.e. above 1, will be allocated to portfolio 2. Unfortunately, in the case of companies from the US market such a division was not possible, as for most of them the P/BV ratio was much higher than 1. As a result of this situation, the arithmetic mean of the P/BV ratio in each year was calculated, and then the companies below the mean were classified in portfolio 1 and those above in portfolio 2. In this way, two portfolios each were created on the Polish stock exchange ($P1_{GPW}$ and $P2_{GPW}$) and the American Stock Exchange ($P1_{US}$ and $P2_{US}$), which were then compared in terms of the rate of return obtained during the study period. Each portfolio consisted of the 10 companies with the best P/BV ratios in the group under consideration. In this study, portfolios were held for one year (from the beginning of January to the end of December), after which annual return rates were calculated for each portfolio and the procedure was then repeated in the same way. The compositions of investment portfolios and the rates of return of individual companies that are their components over the last 5 years are presented in Tables 1 and 2.

Table 1. Compositions of portfolios 1 and 2 and rates of return (%) of individual companies in the years 2016–2020 – issuers listed on the Polish stock exchange

Number of companies	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	11
Portfolio 1_{2016}	WOD	CEZ	FSG	EFK	EDI	AQU	ASE	RAF	AMB	ACP
Return $rate_{2016}$	–8.76	1.90	–18.56	29.15	–9.22	28.79	–6.67	25.36	7.63	–2.77
Portfolio 2_{2016}	ZWC	PSW	SFG	CCC	BDX	KRK	EUR	OPN	ETX	LPP
Return $rate_{2016}$	14.47	35.49	148.89	55.86	4.46	–11.43	–15.56	72.16	41.61	3.35
Portfolio 1_{2017}	WOD	CEZ	EFK	EDI	FSG	RAF	AQU	ACP	ZAP	ASE
Return $rate_{2017}$	0.53	16.81	–11.52	4.19	18.73	–28.90	–9.94	–19.11	–11.63	42.86

1	2	3	4	5	6	7	8	9	10	11
Portfolio 2_{2017}	ZWC	PSW	SFG	CCC	LPP	BDX	ETX	KRK	SKA	ACG
Return $rate_{2017}$	7.27	12.41	–16.94	35.06	61.97	5.37	–0.71	–5.65	24.58	–1.42
Portfolio 1_{2018}	WOD	CEZ	EFK	ZAP	FSG	EDI	RAF	STF	AQU	TLX
Return $rate_{2018}$	–11.86	8.73	–7.56	–57.75	–1.19	–12.39	–19.84	–40.00	–1.24	–39.47
Portfolio 2_{2018}	ZWC	SFG	PSW	CCC	ETX	KRK	LPP	BDX	ACG	SKA
Return $rate_{2018}$	–2.12	–13.39	–39.60	–33.48	–9.09	5.13	–14.25	–43.76	5.12	–0.64
Portfolio 1_{2019}	EFK	CEZ	WOD	FSG	RAF	STF	ZAP	INL	AQU	EDI
Return $rate_{2019}$	–50.23	–5.84	21.90	–8.02	–7.29	–16.94	33.13	–23.07	1.28	26.70
Portfolio 2_{2019}	ZWC	SFG	ETX	KRK	PSW	BDX	LPP	CCC	ACG	SKA
Return $rate_{2019}$	6.06	–14.59	4.74	24.70	21.11	50.33	11.08	–43.88	7.83	5.81
Portfolio 1_{2020}	CEZ	FSG	WOD	EFK	STF	ZAP	AQU	TLX	BHW	PEO
Return $rate_{2020}$	5.26	–29.19	44.36	11.81	–4.68	–8.92	–3.16	–7.26	–33.55	–40.10
Portfolio 2_{2020}	ZWC	CCC	SFG	ETX	KRK	BDX	PSW	LPP	IFI	SKA
Return $rate_{2020}$	–2.81	–24.49	–31.43	–28.57	39.29	72.94	16.73	–6.33	68.57	9.20

Source: own study.

Over the past 5 years, it has been observed that on the Polish stock exchange, among companies paying dividends continuously, higher average return rates have been generated by companies with potential growth rather than potential value. For portfolio 2, made up of the 10 companies with the highest P/BV ratios, the average annual return was 10.23% (see Table 3). Considering the entire period subject to research, it can be observed that the cumulative average return rate of portfolio 2 is 51.05% and that of portfolio 1 is negative at –13.66%.

Table 2. Compositions of portfolios 1 and 2 and rates of return (%) of individual companies in the years 2016–2020 – issuers listed on the US stock exchange

Number of companies	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	11
Portfolio 1_{2016}	GS	JPM	ED	CVX	TRV	ADM	XOM	DOV	WMT	INTC
Return $rate_{2016}$	37.28	38.71	18.66	38.36	13.88	31.43	20.65	24.70	1.74	10.26
Portfolio 2_{2016}	PEP	ADP	IBM	LOW	MMM	VZ	NKE	KO	GWW	MSFT
Return $rate_{2016}$	9.05	28.31	26.75	2.38	24.88	21.64	9.36	0.96	17.54	16.49
Portfolio 1_{2017}	GS	ADM	JPM	CVX	ED	TRV	XOM	PFE	BDX1	WBA
Return $rate_{2017}$	6.79	–10.51	25.39	10.46	19.38	14.78	–4.47	14.10	31.56	1.81
Portfolio 2_{2017}	IBM	LOW	PEP	ADP	MMM	KO	MSFT	V	GWW	NKE
Return $rate_{2017}$	–4.68	47.48	17.79	15.74	35.30	13.45	39.74	44.44	3.37	–2.31
Portfolio 1_{2018}	GS	ADM	JPM	CVX	ED	XOM	TRV	RTX	SWK	WBA
Return $rate_{2018}$	–33.76	5.23	–7.50	–12.08	–5.09	–16.49	–7.14	–15.05	–27.63	–13.53

1	2	3	4	5	6	7	8	9	10	11
Portfolio 2_{2018}	LOW	ADP	NKE	IBM	MMM	PEP	KO	MSFT	V	GWW
Return rate$_{2018}$	–5.58	15.44	38.62	–22.97	–17.00	–3.31	7.56	20.23	15.99	21.97
Portfolio 1_{2019}	GS	ADM	TRV	XOM	CVX	ED	JPM	WBA	SWK	DIS
Return rate$_{2019}$	36.41	17.17	19.38	4.93	13.30	24.70	44.76	–22.08	40.03	34.35
Portfolio 2_{2019}	ADP	NKE	PEP	IBM	MSFT	KO	V	MMM	GWW	MRK
Return rate$_{2019}$	33.71	7.16	28.77	21.92	58.26	21.69	42.27	–4.50	24.81	23.59
Portfolio 1_{2020}	GS	XOM	ED	CVX	TRV	JPM	ADM	RTX	WBA	INTC
Return rate$_{2020}$	15.25	–37.22	–15.49	–26.51	4.87	–6.67	13.03	–23.67	–21.62	–16.06
Portfolio 2_{2020}	IBM	NKE	PEP	MSFT	ADP	V	KO	GWW	MRK	MMM
Return rate$_{2020}$	–2.17	27.79	12.37	39.94	5.97	15.15	3.13	20.64	–8.31	0.73

Source: own study.

Table 3. Average annual return rate on portfolios 1 and 2 of 10 companies – stock exchange in Poland (%)

Portfolio/Year	$\bar{r}A_{2016}$	$\bar{r}A_{2017}$	$\bar{r}A_{2018}$	$\bar{r}A_{2019}$	$\bar{r}A_{2020}$	$\bar{r}A_{2016-2020}$
Portfolio 1 (companies with potential value)	4.68	0.20	–18.26	–2.84	–6.54	–4.55
Portfolio 2 (companies with potential growth)	34.93	12.19	–14.61	7.32	11.31	10.23

Source: own study.

The situation is similar in the case of the American Stock Exchange, where the average annual rate of return over the entire period in question for companies with a high level of P/BV ratio is significantly higher than for companies with a low level of this ratio. Between the years 2017 and 2020, the average annual return rates of companies with potential growth dominated over those with potential value. Only in 2016 was there a better performance for a portfolio composed of companies with potential value (see Table 4). This means that in recent years, market valuations have challenged earlier studies (Fama, French, 1992, pp. 427–465) proclaiming that one should choose companies with potential value, as growth companies have the highest risk and the lowest return rate (Haugen, 1999, pp. 2–10). On the other hand, high P/BV ratios may indicate an overvaluation of companies with potential growth, and – therefore – one would expect to see a shift away from these companies towards companies with potential value in the near future, as it was the case before the financial crisis in 2009.

Unfortunately, at present it is not possible to draw such far-reaching conclusions primarily due to the constantly advancing globalization, implemented advanced IT solutions and technologies or even other unexpected events, such as the COVID-19 pandemic, which can

overnight change trends and interest in particular businesses and make it impossible to assess them properly in the future.

Table 4. Average annual return rate on portfolios 1 and 2 of 10 companies – stock exchange in US (%)

Portfolio/Year	$\bar{r}A_{2016}$	$\bar{r}A_{2017}$	$\bar{r}A_{2018}$	$\bar{r}A_{2019}$	$\bar{r}A_{2020}$	$\bar{r}A_{2016–2020}$
Portfolio 1 (companies with potential value)	23.57	10.93	–13.30	21.29	–11.41	6.22
Portfolio 2 (companies with potential growth)	15.74	21.03	7.09	25.77	11.52	16.23

Source: own study.

It seems interesting to analyze the results obtained in 2020 when the world was facing the SARS-CoV-2 pandemic. At that time, there was huge perturbation and panic in the financial markets, which resulted in drastic falls in share prices. According to the research conducted on the Polish market, the average annual rate of return was higher for companies with potential growth and amounted to 11.31%, as compared to –6.54% for companies with potential value (Table 3). Moreover, it was observed that Polish dividend companies with potential value in the period of economic turbulence in 2020 were characterized by a significantly lower level of risk (the standard deviation of portfolio 1 amounted to $\sigma_{P1_GPW} = 23.36$ pp.) than those dividend companies with potential growth ($\sigma_{P2_GPW} = 36.20$ pp.). On the other hand, in the case of the US market, clearly higher annual return rates were generated by companies with potential growth, and – at the same time – they were characterized by a lower level of risk than companies with potential value ($\sigma_{P2_US} = 14.03$ pp.; $\sigma_{P1_US} = 16.68$ pp. respectively). Moreover, portfolio 1 built from US companies achieved a negative average annual return rate in 2020 (Table 4).

The final stage of consideration was the analysis of the impact of macroeconomic factors, such as inflation, GDP, industrial production, or PMI, but also market factors, i.e. the P/BV ratio, on changes in the share prices of dividend companies with potential value and growth listed on the Polish and US stock exchanges in 2016–2020. The study was conducted using the Spearman rank correlation coefficient and significance test for the Spearman rank correlation coefficient. A non-parametric *t*-test was carried out to check whether the estimated correlation was statistically significant. The closer the value of the Spearman coefficient is to 0, the weaker the monotonic relationship is between the analyzed characteristics. As a result, the following hypotheses were adopted:

H_1: $\rho = 0$ (there is no monotonic relationship between the two characteristics in the sample).

H_2: $\rho \neq 0$ (there is a monotonic relationship between the two characteristics in the sample).

The p-value determined from the test statistic was then compared with the significance level α ($\alpha = 0.05$ was assumed), hence:

– if p-value > α this means that there are no grounds for rejecting H_0;

– if p-value ≤ α then H_0 is to be rejected, assuming H_1 (then the correlation is significant).

The results of the study are presented below in Tables 5 and 6.

Table 5. Influence of macroeconomic and market factors on changes in share prices of Polish dividend companies in 2016–2020

Ratio/Portfolio	Portfolio 1		Portfolio 2	
	spearman's ρ	p-value	spearman's ρ	p-value
Inflation	–0.70	0.2333	0.90	0.0833
GDP	0.30	0.6833	–0.60	0.3500
Industrial production	–0.10	0.9500	–0.30	0.6833
PMI	0.30	0.6833	–0.60	0.3500
P/BV	–0.10	0.9500	0.60	0.3500

Source: own study.

As mentioned earlier, research conducted by E.F. Fama (1981, pp. 545–565) on the US market has shown that share prices change inversely to inflation. This effect is also partially confirmed in this study for dividend companies with potential value listed on the Polish stock exchange and for companies with potential growth listed on the US stock exchange – Tables 5 and 6. The observed relationship is relatively high in the case of portfolio 1 of the Polish companies ($\rho_{P1_GPW} = -0.70$), while there is no basis to reject the hypothesis H_0 stating that the variables are independent (p-value = 0.2333). A completely different result was observed for companies with potential growth from the Polish stock exchange ($P2_{GPW}$) and companies with potential value from the US stock exchange ($P1_{US}$), whose share prices followed the same direction as inflation ($\rho_{P2_GPW} = 0.90$ and $\rho_{P1_US} = 0.82$ respectively). In both cases, one can even speak of a high Spearman rank correlation. While such a result can easily be explained on the Warsaw Stock Exchange – the lack of increased or negative reaction of investors to higher inflation levels is mainly due to Poland's economic and historical conditions, to which investors have become accustomed to over the past decades – it is more difficult to understand such behavior on the US market.

Table 6. Influence of macroeconomic factors on changes in share prices of US dividend companies in 2016–2020

Ratio/Portfolio	Portfolio 1		Portfolio 2	
	spearman's ρ	p-value	spearman's ρ	p-value
Inflation	0.82	0.0886	–0.36	0.5528
GDP	0.40	0.5167	–0.30	0.6833
Industrial production	0.40	0.5167	–0.30	0.6833
PMI	–0.20	0.7833	0.10	0.9500
P/BV	0.50	0.4500	0.70	0.2333

Source: own study.

Interesting, yet surprising, results were obtained by examining the rate of GDP growth on changes in share prices (Tables 5 and 6) For both Polish and US companies with potential growth, a negative correlation was estimated for 2016–2020. Although for the portfolio of US companies this correlation is low, in the case of the Polish equity portfolio under consideration it is relatively high, so the correlation is significant. This means that economic growth does not have a positive impact on share prices with potential growth. The opposite was observed for both dividend portfolios with potential value ($P1_{GPW}$ and $P1_{US}$), with the Spearman rank correlation coefficients at low levels. In most cases, equity prices are also negatively related to industrial production (the exception being Portfolio 1 on the US stock market, where a weak positive correlation was obtained) and the PMI (excluding $P1_{GPW}$ and $P2_{US}$, which were positively correlated). However, given the p-value levels for the two-sided null hypothesis of the rank coefficient of the analyzed portfolios (p-value > 0.05), there is no basis to reject the H_0 hypothesis.

Finally, the impact of the market P/BV ratio on share price changes was analyzed. A relatively high positive correlation is shown by the Polish portfolio of companies with potential growth and both portfolios of US companies, which confirms the correlation noted in the analysis of rates of return, which shows that the high P/BV ratios of shares positively affect their prices. In contrast, the portfolio with the potential value of companies from the Warsaw Stock Exchange is characterized by a weak negative correlation ($\rho_{P1_GPW} = –0.1$), which also complements and – at the same time – certifies the results obtained earlier.

Discussion and conclusions

A study of dividend companies listed in Poland and the US that paid dividends between 2016 and 2020, along with a breakdown of issuers with value and potential growth, revealed differences in return rates and their correlations with macroeconomic factors. First of all, it needs to be noted that on the Polish and American Stock Exchanges, among companies paying dividends continuously, higher average return rates have been generated by companies with potential growth rather than potential value. This was particularly evident in the case of the portfolio built from companies with the highest P/BV ratios, for which the average annual return rate was 10.23%. Given the aim of the study and the hypotheses adopted, it is important to analyze the results obtained in 2020, when the world was facing the COVID-19 pandemic. The research conducted on the Polish market indicate that the average annual rate of return was higher for the portfolio of companies with potential growth and amounted to 11.31%, as compared to –6.54% for companies with potential value. Moreover, it was observed that Polish dividend companies with potential value during the period of the turbulent economy that took place in 2020 are characterized by a lower risk than dividend companies with potential growth. In contrast, in the case of the US market, irrespective of the size of the portfolio, clearly higher annual return rates were generated by companies with potential growth, which were also characterized by a lower level of risk.

Based on the conducted research, the adopted research hypotheses were verified, and on this basis, it was concluded that:

H_1: Polish and US dividend companies with potential value for the period 2016–2020 do not have higher average annual return rates than dividend companies with potential growth. They have lower annual return rates. This hypothesis was verified negatively.

H_2: Polish dividend companies with potential value during the period of the turbulent economy in 2020 are characterized by a lower average annual return rate but lower risk than dividend companies with potential growth. In the case of the US market, higher annual return rates were generated by companies with potential growth, which were also characterized by a lower level of risk. This hypothesis was in part verified negatively.

H_3: Prices of shares of companies with potential value:

– in the case of the US market, inflation and, to a moderate extent, industrial production and GDP and the P/BV ratio are important determinants,

– in the case of the Polish market, they are significantly negatively determined by the level of inflation. This hypothesis was in part verified negatively.

Based on comparisons of the portfolios of dividend companies divided into companies with value and potential growth, recommendations for capital market investors can be indicated. Regardless of whether the analysis covered shorter periods or the entire study period, it was noted that the cumulative rate of return on the portfolio of companies with potential growth was significantly higher. Investors expecting higher yields should overweight such dividend companies in their portfolios.

The only limitation of the conducted research was the smaller number of Polish companies systematically paying dividends in comparison with US companies, which results, among others, from the history and conditions of the functioning of both stock exchanges.

References

Akani, H.W., Sweneme, Y. (2017). Macroeconomic Aggregates and Retention Ratio of Quoted Firms in Nigeria. *Asian Finance & Banking Review*, *1* (1), 55–63.

Al-Malkawi, H.A.N. (2008). Factors Influencing Corporate Dividend Decision: Evidence from Jordanian Panel Data. *International Journal of Business*, *13* (2).

Asquith, P., Mullins, Jr D.W. (1983). The Impact of Initiating Dividend Payment on Shareholders' Wealth. *Journal of Business, 56* (1), 77–96. DOI: 10.1086/296187.

Baker, M., Wurgler, J. (2004). Appearing and disappearing dividends: The link to catering incentives. *Journal of Financial Economics*, *73* (2), 271–288. DOI: 10.1016/j.jfineco.2003.08.001.

Basse, T., Reddemann, S. (2011). Inflation and the Dividend Policy of US Firms. *Economy watch*, *6* (4), 33–64.

Brigham, E.F., Houston, J.F. (2005). *Podstawy zarządzania finansami.* Warszawa: PWE.

DeAngelo, H., DeAngelo, L., Stulz, R.M. (2006). Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory. *Journal of Financial Economics*, *81* (2), 227–254. DOI: 10.1016/j.jfineco.2005.07.005.

Dębski, W., Bujnowicz, I. (2008). Model współzależności rozwoju systemu finansowego i wzrostu gospodarczego w Polsce. *Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania Uniwersytetu Szczecińskiego*, *9*, 9–20.

Fama, E.F. (1981). Stock Returns, Real Activity, Inflation, and Money. *The American Economic Review*, *71* (4), 545–565.

Fama, E.F., French, K.R. (1992). The Cross-Section of Expected Stock Returns. *The Journal of Finance*, *47* (2), 427–465. DOI: 10.1111/j.1540-6261.1992.tb04398.x.

Fuller, K.P., Goldstein, M.A. (2011). Do Dividends Matter More in Declining Markets? *Journal of Corporate Finance*, *17* (3), 457–473.

Giri, A.K., Pooja, J. (2017). The Impact of Macroeconomic Indicators on Indian Stock Prices: An Empirical Analysis. *Studies in Business and Economics*, *12* (1), 61-78. DOI: 10.1515/sbe-2017-0005.

Haugen, R.A. (1999). *Nowa nauka o finansach. Przeciw efektywności rynku*. Warszawa: WIG-Press.

Hazlitt, H. (2007). *Inflacja, wróg publiczny nr 1.* Warszawa: Fijorr Publishing.

Khan, J., Khan, I. (2018). The Impact of Macroeconomic Variables on Stock Prices: A Case Study of Karachi Stock Exchange. *Journal of Economics and Sustainable Development*, *9* (13), 15–25.

Kowerski, M. (2011). *Ekonomiczne uwarunkowania decyzji o wypłatach dywidend przez spółki publiczne*. Kraków-Rzeszów-Zamość: Konsorcjum Akademickie Wydawnictwo WSE w Krakowie, WSIiZ w Rzeszowie i WSZiA w Zamościu.

Lee, T. (2000). *Ekonomia dla inwestorów giełdowych*. Warszawa: WIG-Press.

Lichtenfeld, M. (2015). *Get Rich with Dividends.* New Jersey: John Wiley&Sons.

Megaravalli, A.V., Sampagnaro G. (2018). Macroeconomic indicators and their impact on stock markets in ASIAN 3: A pooled mean group approach. *Cogent Economics & Finance*, *6* (1), 1–14. DOI: 10.1080/23322039.2018.1432450.

Modigliani, F., Cohn, R.A. (1979). Inflation, Rational Valuation and the Market. *Financial Analysts Journal*, *35* (2), 22–44. DOI: 10.2469/faj.v35.n2.24.

Muhammad, A.A., Khan, F. (2018). The Relationship between Macroeconomic Variables and the Dividend Payout Ratio of the Textile Sector Listed on Pakistan Stock Market. *Sarhad Journal of Management Sciences (SJMS)*, *4* (1), 111–121.

Naik, P.K., Padhi, P. (2012). The Impact of Macroeconomic Fundamentals on Stock Prices Revisited: Evidence from Indian Data. *Eurasian Journal of Business and Economics*, *5* (10), 25–44.

Romus, M., Rizga, A., Abdillah, M.R., Zakaria, N.B. (2020). Selected Firms Environmental Variables: Macroeconomic Variables, Performance and Dividend Policy Analysis. *IOP Conf. Series: Earth and Environmental Science*, *469*, 1–6. DOI: 10.1088/1755-1315/469/1/012047.

Rubin, H. Spaht, II C. (2011). Financial Independence Through Dollar Cost Averaging and Dividends Reinvestment. *Journal of Applied Business and Economics*, *12* (4), 11–19.

Skousen, M. (2011). *Struktura produkcji. Giełda, kapitał, konsumpcja.* Warszawa: Fijorr Publishing Company.

Skousen, M. (2011b). *Inwestowanie w jednej lekcji*. Warszawa: Fijorr Publishing Company.

Tuzimek, R. (2013). *Decyzje finansowe w spółkach giełdowych a wartość akcji*. Warszawa: Oficyna Wydawnicza Szkoły Głównej Handlowej.

Williams, A., Miller, M. (2013). Do Stocks with Dividends Outperform the Market during Recession. *Journal of Accounting and Finance*, *13* (1), 58–69.

Citation

Jabłoński, B., Kika, D. (2022). The Impact of Macroeconomic Indicators on the Share Prices of Dividend Companies – a Comparative Analysis of Polish and US Issuers for the Period 2016–2020. *Folia Oeconomica Stetinensia*, *22* (2), 78–96. DOI: 10.2478/foli-2022-0020.