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The Geographical, Economic and Legal Regionalization of the Changes in Dividend Payments in the World

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Abstract

The dynamic growth of nominal and real values of dividends paid in the world, observed since the last quarter of the twentieth century, is determined by the companies with the largest capitalization. However, the increase in global dividend payments is not the same in all countries and is subject to geographical, economic and legal regionalization. It is also disturbed by economic fluctuations (especially the 2008 crisis) and, more recently, by the COVID-19 pandemic. The paper, using the data from the survey of Janus Henderson Investments, analyses changes in dividend payments in geographical (continents) economic (countries with a similar level of economic development) and legal (countries with similar legal systems) regions by the 1,200 largest companies in the world between 2009 and 2021. Linnear trend models taking into account the COVID-19 pandemic in the world and in separate regions and subregions, as well as the panel partial adjustment model of dividends vs. GDP, were estimated. The conducted research confirmed the impact of different forms of regionalization on the rate of dividend payments by the world's largest companies. In the years 2009–2021 dividend payments in Australia and Asia grew the fastest. COVID-19 significantly reduced dividend payments in 2020 in Europe. Dividend payments in emerging markets countries grew faster than in developed markets countries and COVID-19 did not significantly reduce payouts on emerging markets. However, it is the developed markets that still provide the vast majority of dividends. The common law system is more favorable to dividend payments.

Keywords: dividends, Janus Henderson Investment dividend survey, geographical regions, economic and legal regions, trend model, panel dynamic partial adjustment model

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Introduction

The studies of dividends (dividend policy) have almost a century history and focus on the construction of theories explaining the mechanisms of dividend decisions and the factors shaping them, as well as empirical verification of formulated hypotheses. These studies are becoming more and more practical with the observed dynamic increase in the value of dividends paid around the world. Damodaran, using data from 47,600 companies, documented the payment of USD 2,150.8 billion[1] in dividends worldwide in 2021.[2] Of course, the spatial distribution of payments in the world is not equal and the size of payments varies from country to country at different rates.

The fact that the a country's specific geographical location has a significant impact on its economic processes has been known for a long time. The proximity of countries with highly developed economies is conducive to economic development (e.g., the influence of West European countries on the development of Central European countries or the influence of the so-called "Asian tigers" and Japan on the development of China). On the other hand, the proximity of countries with weak

1. As in American usage, a thousand million.
2. See: https://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html.

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economies is not conducive to development (sub-Saharan Africa, South America). In this way, entire areas of the world with a similar economic situation (good or bad) are formed. This also applies to capital markets and financial decisions. Yet, financial markets form a global financial system, and in the era of internetization and shrinking space-time, distance (neighborhood) has less and less impact on financial decisions (Szulc and Wleklińska 2021, 8). Therefore, the spatial diversity of financial phenomena and decisions should be examined not only geographically but also in economic and legal terms.

The aim of this study is to analyze changes in the value of dividends paid by the 1,200 largest companies in the world not only in geographical regions (continents) but also in economic regions (countries with a similar level of economic development) and legal regions (countries with similar legal systems) in the years 2009–2021. The author formulates the hypothesis that in the second decade of the twenty-first century, the dividend growth rate of 1,200 of the world's largest companies differed, depending on the geographical, economic and legal regions to which the analyzed companies belonged. The data was sourced from reports prepared by Janus Henderson Investors.[3] The paper presents the results of estimating the trend models of dividend payments in the world according to three regionalizations: geographical, economic, and legal. A panel, dynamic model of partial adjustments of dividend payments to the GDP of individual countries in the years 2009–2021 was also estimated.

The first chapter reviews the literature, the second chapter presents the research methodology, and the third chapter presents the results of the analysis of the changes in dividend payments in the world in specified geographical, economic and legal regions. The work is concluded with a summary.

1 Literature review

Although the history of dividend payments is almost 650 years old,[4] dividends became more important with the emergence of the modern capital market and the development of stock exchanges in the USA, Western European countries and Japan in the second half of the nineteenth century. The development of capital markets — the emergence of stock exchanges in countries along with the increase in the capitalization of listed companies — meant that the value of the dividends paid increased. However, it was only in the last quarter of the twentieth century that a real revolution took place in the financial sectors of the most developed countries. There was an explosion in the size of the stock markets (the growth of the existing ones and the emergence of new ones) (Zingales 2012, 585–586) and thus a significant, although heterogeneous and uneven, increase in the value of the dividends paid.

DeAngelo, DeAngelo, and Skinner (2004, 431) calculated that between 1978 and 2000, the value of the dividends paid by industrial companies[5] listed on the New York Stock Exchange increased in nominal terms from USD 31.3 billion to USD 101.6 billion (i.e., by 224.6%, and in real terms by 22.7%). In the following years, the increase in dividend payments continued. At that time, the largest companies systematically paid dividends. For example, in 2007 dividends paid by all the companies that formed the Dow Jones Industrial Average amounting to USD 114.6 billion (DeAngelo, DeAngelo, and Skinner 2009, 135–136).

Banks recorded a much higher growth rate of the value of dividends paid than industrial companies. Floyd, Li, and Skinner (2015, 305–306) compared the payout policies of US banks to those of industrials and non-bank financials over a thirty-year period, including the 2008 financial crisis, and documented that banks have a higher and more stable propensity to pay dividends than industrials companies. This was particularly evident between 1980 and 2008, when the annual growth of aggregate real dividends (converted to 2012 dollars using the consumer price index) for banks was 7.5% and for other companies only 2.4%, and the share of banks' dividends in total dividends

3. See: https://www.janushenderson.com/en-gb/adviser/jh-global-dividend-index/.

4. Le Bris, Goetzmann and Pouget (2016) give the example of the Bazacle company from Toulouse, which paid dividends between 1372 and 1946.

5. Research on dividend policy in the U.S. and other capital markets introduced the concept of industrial companies, which includes non-financial companies that are not utilities.

increased from 5.8% in 1980 to 21.2% in 2007. At least 80% of banks systematically paid dividends from 1980 to 2007. After the crisis, the value of dividends paid by banks fell dramatically, and in 2012 the share of bank payments in the total value of dividends paid decreased to 6.8%.

In 15 countries of the "old" European Union, the value of dividends paid by industrial companies increased from EUR 34.8 billion in 1994 to a record EUR 114 billion in 2001. In 2003, the value of payments fell to EUR 89 billion, and in 2005 it almost returned to the record from 2001 (EUR 112.5 billion) (von Eije and Megginson 2008). The strong trend of increasing the value of dividends paid in the years 1989–2002 in 6 countries (USA, Canada, Great Britain, Germany, France, and Japan) was confirmed by Denis and Osobov (2008).

Since the early 1990s, prof. Aswath Damodaran has been constantly collecting and analyzing financial data from all over the world.[6] These data include, in particular, yearly aggregated values of dividends (regular and special) paid out by companies in different groups of countries. The data obtained by Damodaran from 47,600 companies from all over the world allowed him to estimate the total value of dividends paid in 2021 at USD 2150.8 billion. The USA remains the largest payer (USD 591 billion in 2021). In the years 2014–2021, a dynamic increase in the value of dividends paid could be observed, which was slightly disturbed in 2020 by the pandemic. The value of the dividends paid at that time in the world increased nominally by 48%. The fastest growth in value could be observed in the case of dividends paid by Japanese companies (by 145% in 2014–2021) and those from emerging markets (by 64.9%). Only a slightly slower growth was recorded in the USA. At the same time, in these three groups there are no disturbances caused by the coronavirus pandemic. The smallest increase in dividend payments in the years 2014–2021 (only by 11.6%) was observed in Europe, with a particularly large drop in payouts occurring in 2020, which determined the global decline in the value of payouts in 2020. In 2021, Europe "failed" to return to the level of payments from before the pandemic. The different dynamics of payouts meant that the share of Emerging markets in the total value of payouts increased by 4.3 percentage points (to 42.0%) and Europe's share fell by 6.4 p.p. (to 19.4%).

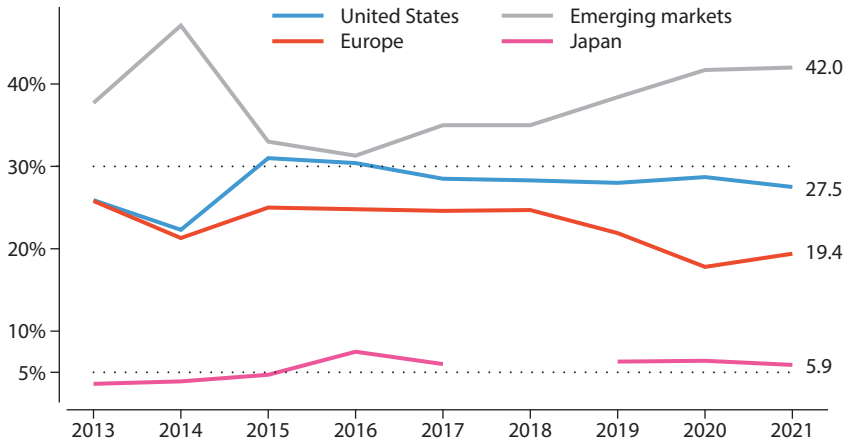

Figure 1. Changes in the dividend value structure by regions in the years 2013–2021

Source: Own calculations based on the data from Table 1.

Recent USA market research by Kahle and Stulz (2021, 1360) found that "the average annual inflation-adjusted amount paid out through dividends and repurchases by public industrial firms in USA is more than three times larger from 2000 to 2019 than from 1971 to 1999."

A characteristic feature of the dividend policy in the last quarter of the twentieth century was a decrease in the share of companies paying dividends in the total number of industrial companies. In the USA, the decrease was from 68.6% in 1979 to 20.8% in 1999 (Fama and French 2001, 25), from 68.4% in 1978 to 19.5% in 2001 (DeAngelo, DeAngelo, and Skinner 2009, 130), from 70.3% in 1977 to 22.3% in 2000 (Baker and Wurgler 2004, 1134), and from 57.2% in 1980 to 15.3% in 2001

6. See: https://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html.

Table 1. Value of dividends (regular and special), paid out by companies by regions

	Global				United States				Europe				Japan				Emerging markets			
Year	Number of firms	Dividends (USD billion)	Payout ratio (%)	Dividend yield (%)	Number of firms	Dividends (USD billion)	Payout ratio (%)	Dividend yield (%)	Number of firms	Dividends (USD billion)	Payout ratio (%)	Dividend yield (%)	Number of firms	Dividends (USD billion)	Payout ratio (%)	Dividend yield (%)	Number of firms	Dividends (USD billion)	Payout ratio (%)	Dividend yield (%)
2011	41,803	n.d.	29.4	2.2	5,891	439.9	37.9	2.2	5,204	n.d.	37.5	3.2	3,569	n.d.	9.2	0.5	19,941	n.d.	29.3	2.5
2012	40,943	n.d.	37.5	2.2	6,177	497.3	36.1	2.2	6,022	n.d.	56.5	2.9	3,522	n.d.	60.8	2.5	18,943	n.d.	36.6	2.5
2013	40,906	1,452.9	44.0	2.4	7,766	375.9	33.2	1.8	6,073	374.9	60.6	2.6	3,528	52.0	18.5	1.2	19,083	547.5	47.2	3.1
2014	42,410	1,976.9	54.4	3.0	7,887	440.1	37.2	1.8	6,532	420.8	54.7	3.0	3,592	76.5	27.1	1.8	19,929	930.9	75.4	4.9
2015	41,889	1,564.9	52.3	2.4	7,480	485.1	52.2	2.1	6,568	391.1	67.8	2.8	3,631	72.8	25.2	1.5	19,896	516.8	46.1	2.6
2016	42,678	1,617.9	56.4	2.4	7,330	491.3	56.1	2.0	6,655	401.6	72.2	3.0	3,679	121.8	41.4	2.5	20,578	506.5	46.8	2.5
2017	43,848	1,703.5	44.3	2.1	7,247	486.0	42.9	1.7	6,612	419.3	52.0	2.5	3,755	101.8	29.3	1.7	21,607	596.7	43.3	2.4
2018	43,848	1,892.8	42.0	2.7	7,209	536.0	39.0	2.0	6,519	467.2	49.3	3.4	n.d.	n.d.	n.d.	n.d.	21,855	661.7	42.4	3.1
2019	44,394	2,034.1	48.5	2.3	7,053	570.0	46.0	1.7	6,702	446.1	51.2	2.7	3,854	128.5	34.3	2.1	22,402	782.1	51.3	2.9
2020	46,580	1,994.8	75.3	1.9	7,582	572.7	71.3	1.4	6,830	354.9	106.8	2.0	3,893	127.3	57.8	1.9	23,680	831.4	68.3	2.4
2021	47,606	2,150.8	38.6	1.8	7,229	591.7	33.1	1.1	7,180	418.3	39.4	2.0	3,947	127.3	28.4	2.0	24,435	903.0	44.4	n.d.
Rate[a]	16.4	48.0	n/a	n/a	−6.9	57.4	n/a	n/a	18.2	11.6	n/a	n/a	11.9	145.0	n/a	n/a	28.0	64.9	n/a	n/a

Source: https://pages.stern.nyu.edu/~adamodar/New_Home_Page/dataarchived.html.

n.d. — no data available; n/a — not applicable

Note: Europe: 15 "old" EU, Switzerland and Norway, Emerging Markets: Asia other than Japan, Latin America, Eastern Europe, Russia, Middle East and Africa.

[a]Rate 2021/2013 (%)

(Floyd, Li, and Skinner 2015). Observing this phenomenon, Fama and French (2001) introduced the concept of "disappearing dividends" into the literature. The years 1990–2002 are called "dividend dark ages" (Miller 2006, 244).

At that time, the share of banks paying dividends was also falling, but it was much slower, and the share of banks paying dividends among all banks remained significantly higher than the same rate for industrial companies. From 1980 to 1990 the fraction of banks that paid dividends declined from 99% to 87% before dropping to around 80% in the recession of the early 1990s. After this it remained in the 80% range until 2008. In the following years, as a result of the crisis, the share of paying banks decreased by 2011 (to 62.1%). It was only in 2012 that there was a rebound (to 65.3%) (Floyd, Li, and Skinner 2015).

Since 2002, there has been a slight increase in the share of companies paying dividends to 27.6% in 2005, according to DeAngelo, DeAngelo, and Skinner (2009, 130), and to 28.1% in 2012, according to Floyd, Li, and Skinner (2015). Farre-Mensa, Michaely, and Schmalz (2014) found that 2000 in the US market was the last year of the decline in the share of industrial companies paying dividends and calculated that in 2012 the share of companies paying dividends was 35%, the highest since 1985. Further research by these authors showed that by 2019, the share of payers had slightly decreased (Farre-Mensa, Michaely, and Schmalz 2020, 38). A similar process has taken place in other countries. The share of companies paying dividends in the total number of industrial companies in the 15 countries of the "old" European Union has been falling since the nineties (von Eije and Megginson 2008) and decreased from 87.7% between 1989 and 1990 to 50.9% 15 years later. This process is similar to that diagnosed on the New York Stock Exchange, but in Europe it began much later than in the USA (1990 and 1977 respectively) and it is taking place at a much faster pace. Hail, Tahoun, and Wang (2014), using data from 32,531 companies from 49 countries with asset values exceeding USD 10 million, showed that there was a significant decrease in the share of dividend payers from 77.7% in 1993 to 55.6% in 2008, which varied from continent to continent.

There is a consensus that the reason for the decrease in the share of companies paying dividends is both the increase in the number of small companies that pay dividends much less often and the decrease in the propensity to pay dividends among those who have been paying so far. However, there is no longer a consensus on the scale of the impact of both factors on the decrease in the share of payers. Fama and French (2001) showed that the decline in the propensity to pay dividends was about half due to an increase in the share of companies with characteristics unfavorable to paying dividends (small companies with low profitability and large investment opportunities), which began to enter the stock exchange in large numbers after 1978, and half due to a decrease in the current propensity to pay dividends. In turn, DeAngelo, DeAngelo, and Skinner (2004, 428) found that the decline in the shares of dividend-paying companies on the New York Stock Exchange was primarily due to the rapid growth of small companies with low or no profitability. At that time, the largest companies systematically paid dividends.

The analysis presented so far shows that the value of dividends paid is growing and at the same time the share of companies paying dividends is decreasing. Is it possible? Of course, yes. There is a concentration of payouts as a small group of the largest companies makes ever larger individual payments. Between 1978 and 2000, the number of companies on the New York Stock Exchange paying dividends with a payout in excess of USD 100 million in 1978 increased by 81%, and the total value of dividends paid by these companies increased by 74.2% in real terms. On the other hand, the number of companies paying dividends with a payout value in 1978 below USD 100 million fell by 60%, and the total value of dividends paid by these companies also fell by 60% in real terms. In the group of companies paying dividends worth less than USD 5 million, the number of payers decreased by 67.6% (DeAngelo, DeAngelo, and Skinner 2004, 433). This meant that the average dividend paid by a company increased very quickly, by 187.5%. While in 1978 the 100 largest dividend payers paid 67.4% of all dividends, in 2000 the 100 largest payers paid 81.8% of all dividends.

The research on dividend payments by companies of the "old" European Union conducted by von Eije and Megginson (2008) showed that in 1989 the share of dividends paid by the smallest payers (companies forming the 1st decile due to the value of their payments) in the total value of

dividends paid was less than 0.1%, and the value of dividends paid by the 2nd decile companies accounted for only 0.1% of all payments. On the other hand, 20% of the largest payers (the 9th and 10th decile) paid out 89.9% of the total value of payments, with 79% of the 10th decile. In 2005, the share of payments of half of the companies with the smallest payouts in the total value of dividends paid was less than 0.1%, and 20% of the largest payers made payments that accounted for 97.8% of the total value of dividends paid that year.

In each of the 6 countries surveyed by Denis and Osobov (2008), 20% of the largest dividend payers paid at least 80% of all dividends, with the USA, Great Britain, Germany, and France paying more than 90% of the total value of payments. At this point, it is worth quoting the words of John C. Bogle (2009, 57): "History shows that from 1900 to 2007, the total average annual return on shares calculated at 9.5% consisted of about 4.5% of the averaged dividend yield and 5% of the increase in the profitability of listed shares of companies."

Despite nearly a century of research, dividend decisions and their impact on stock prices and therefore the value of companies remain a mystery (Frankfurter and Wood 2002, 111). The fact that there are three mutually exclusive schools trying to explain the impact of dividend decisions on the value of the company (pro-dividend, neutral, anti-dividend) and a whole range of hypotheses and theories shows how ambiguous this issue is (Cwynar and Cwynar 2007, 178–181; Czekaj 1987, 1094; Sierpińska 1999, 131–151). Brigham (Brigham 1995, 225), summarizing the empirical research conducted in this area, stated that any theory can be correct or that all theories can be incorrect.

As part of the pro-dividend school, the most important theories trying to explain the basics of dividend policy include the following:

- "Bird in hand fallacy" theory
  This surprising and even somewhat ironic name comes from Miller and Modigliani (1961, 424), who used it in reference to the views of its creator Myron Gordon (1959). The second creator of this theory is John Lintner (1956, 1962). According to him, investors value dividends more than capital gains and the dividends determine the value of the company. These preferences stem from the fact that, due to the risk, the dividend is more reliable than capital gains — an identical amount of nominal income derived in the form of capital gain represents a smaller value for the shareholder than the same amount obtained in the form of a dividend, since income in the form of capital gain is treated as subject to higher risk (Czekaj and Dresler 2001, 93–102). According to Lintner (1956, 97), dividends and dividend policy are the basis for the company's financial decisions.
- Agency theory
  The authors of the agency theory are Michael Jensen and William Meckling (1976). It is based on the premise of a conflict of interest between shareholders and management boards of companies (agents) and creditors and management boards resulting from the separation of ownership and control functions. According to the agency theory, the increase in the value of dividends is a tool for reducing agency costs and conflicts that increase as companies grow (Easterbrook 1984; Jensen 1986). The payment of dividends means that a company implementing new investment projects requires additional funds, which it can only obtain on the capital market or through the issue of new shares or a loan. In both cases, it must undergo external monitoring by new shareholders and investment banks, both having similar interests as existing shareholders, which reduces the agency costs incurred for the supervision and monitoring of management boards (Easterbrook 1984, 654).
- Life cycle theory of dividends
  The theory of the company's life cycle was proposed in 1972 by Dennis C. Mueller (1972). It was this theory that became the starting point for the formulation of the life-cycle theory of the dividend, which says that a company begins to pay dividends when it moves from a high growth rate phase to a low-growth phase, that is, from a phase of immaturity to a maturity phase in the life cycle (Damodaran 2007, 1021–2022). The decrease in the company's growth rate, profitability and systematic risk determines the moment of transition to the maturity phase. Early-stage companies rarely pay dividends, as opposed to mature companies (Bulan and Subramanian 2009, 211).

- Catering theory of dividends
  The catering theory of dividends was developed by Malcolm Baker and Jeffrey Wurgler (2004) based on the behavioral theory of Hersh Shefrin and Meir Statman (1984). According to this theory, company boards adapt their dividend policy to changes in investors' attitudes to dividend payments (Ferris, Jayaraman, and Sabherwal 2009, 1730). As a result, companies are more likely to pay dividends if the market rewards this decision by better valuing dividend-payers and not to pay if investors prefer non-paying companies. In this way, managers behave like caterers meeting their clients' (investors') preferences.
- Signaling theory
  Greg Filbeck (2009, 163) traces the roots of the signaling theory to the work of Lintner (1956), who pointed to the frequent reactions of stock prices to changes in dividend payment rates. However, it is Sudipto Bhattacharya (1979), Steward Myers and Nicholas Majluf (1984), and Kose John and Joseph Williams (1985) that are considered to be the actual founders of the theory. The basis of the signaling theory is the information asymmetry between management boards and minority shareholders. Minority shareholders usually do not have the same information as boards of directors and majority shareholders. Full information, especially about the future of the company, is not provided by studying the company's reports, either. Therefore, a dividend can be a way to provide minority shareholders and potential investors with information about the actual situation of the company and its future profits. According to the theory of signaling, dividends reduce information asymmetry. Starting to pay dividends or increasing their value is a positive signal about the company's situation, while stopping paying dividends or reducing their value is a negative signal. In response to the signal, the market adjusts the share price: in the case of starting paying or increasing the value of dividends, stock prices should rise, while in the case of stopping or limiting payouts, stock prices should fall.
- Clientele effect
  The clientele effect is the attraction of a given type of investors with a specific dividend policy (Damodaran 2007, 1041–1042). It is based primarily on differences in the taxation of dividends and capital gains. John and Williams (1985, 1065) write that dividend-paying companies have shareholders who need systematically received cash (widows, retirees, financial institutions). Quite often, dividends received by these groups of shareholders are exempt from taxes.

The neutral school is represented by the dividend irrelevance theory, developed by Merton Miller and Franco Modigliani and published in 1961. According to this theory, the dividend policy does not introduce any changes in the value of the company (the so-called MM Proposition III). In a perfect capital market, the value of a company depends on investment decisions, while financial decisions do not affect it (the so-called MM Proposition II). For boards, it does not matter whether they make investments from retained earnings or from newly raised funds (Miller and Modigliani 1961, 412). Although the Miller-Modigliani theory should have dismissed all consideration of dividend policy as insignificant and not affecting the financial situation of the company, in fact, it inspired researchers to analyze it in more detail and formulate new hypotheses and theories. The basic line of criticism of MM theory was based on questioning the assumptions of a perfect market. The market is not perfect and it is its imperfections that make dividends affect the value of shares.

Supporters of the anti-dividend school believe that the dividend is a phenomenon unfavorable to shareholders. This belief is primarily due to the unfavorable taxation of dividends on capital gains that has occurred for many decades in the USA and many other countries. The founders of this school are considered to be Robert Litzenberger and Krishna Ramaswamy (1979). According to many authors, even with equal taxation of dividends and capital gains, the dividend is not beneficial because the shareholder cannot delay the moment of its registration as tax income — the tax liability arises at the time of the payment of the dividend, while the profit from the sale of shares can be realized by shareholders when they want. Therefore, the time at which the tax liability arises is within its competence. With this flexibility, shareholders can limit their liabilities in two ways. First of all, they can realize profits in periods when other sources bring them lower income — then there is a chance that they will not reach the next tax threshold. Second, an

individual shareholder may hold shares until his death, as long as this would give a tax advantage to his heir (Damodaran 2007, 1031).

Empirical research focused primarily on specifying the factors that determine decisions on dividend payments (pay or not to pay) and in the case of payments their value. In order to study the factors determining the decisions to pay dividends, Fama and French (2001) proposed a logit model. They also proposed three groups of factors — profitability, investment opportunities and the size of the company, which, according to the authors, best describe decisions on dividend payments. Fama and French's proposal became an inspiration to look for further factors determining dividend decisions as well as more effective methods of models estimations. This research led to the development of sets of factors for both the markets of individual countries and the global capital market at different times.

Most often, various microeconomic factors describing the economic and financial situation of the analyzed companies were used to describe the decision to pay or not to pay dividends. However, behavioral factors, macroeconomic factors describing the situation of countries' economies and markets as well as the legal systems of the countries in which the analyzed companies operate were also taken into account.

To describe the economic situation of the countries, their GDP was usually used. Jacob and Jacob (2013), on the basis of data from 16,518 companies in 25 countries for the years 1990–2008, estimated logit models, which show, among others, a positive and statistically significant impact of GDP on the propensity to pay dividends — the higher the level of the economic development of the country from which the company comes, the higher the probability that it will pay dividends.

A lot of attention was also paid to the legal systems of the countries from which the analyzed companies came. In general, we can talk about two fundamentally different systems: common law, which originated in England and is based on precedents created since the Middle Ages by royal courts, and civil law, which originated in the Napoleonic period in France and is based on Roman law and the *Corpus Iuris Civilis* of the Byzantine Emperor Justinian I the Great.

Currently, the common law system is found in the United Kingdom, Ireland, the USA, Canada, Australia, New Zealand and parts of Africa and Asia that have been colonized by the United Kingdom (e.g., Sierra Leone, Gambia, Nigeria, Ghana, Liberia, Kenya, Uganda, Tanzania, South Africa, Singapore, Malaysia, Philippines, Hong Kong, and India). The civil law system dominates in most countries of continental Western Europe, Central and South America and parts of Asian countries colonized by countries other than the United Kingdom, as well as in the regions of some countries in which the common law system applies (e.g., Louisiana, Quebec, and Puerto Rico). Japan, which has never been colonized, voluntarily adopted a civil code that refers to a large extent to the German code, although it retains local differences. In most countries of the Middle East, the law of Islam has intertwined with the law of European colonists. In Eastern Europe, communism has bent the system of law for its own purposes, and the current post-communist states are trying to reverse this process (Cooter and Ulen 2009, 70–71).[7]

Legal systems determine the way companies are managed (corporate governance) in a given country, and this directly affects decisions on dividend payments. Corporate law gives external investors, including minority shareholders, the tools to protect themselves against boards and majority shareholders. In the case of minority shareholders, these tools concern the right to receive the same dividend per share as the majority shareholders, to participate in votes on decisions important for the company, including the election of management boards, and to challenge the company if it is acting to the detriment of minority shareholders. The level of the legal protection of external investors depends on the legal provisions and the effectiveness (quality) of their enforcement. Rafael La Porta, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert Vishny (1998) have shown that countries applying common law have a much better system of legal protection for minority shareholders than countries applying civil law. In the common law system, minority shareholders have more effective legal tools to force a company to pay dividends and thus to prevent majority

7. In some countries, legal systems draw on both traditions, and then it is more appropriate to speak of a mixed system.

shareholders from taking over too much of the profits (tunneling). Therefore, in countries applying the common law system, where investors are better protected than in civil law system countries, companies pay higher dividends (La Porta et al. 2000, 5). Moreover, in countries with common law systems, investors are able to accept lower dividend payments by companies with high growth potential because they are convinced that these companies will bring more profits in the future and that the existing legal system will protect them from losses. On the other hand, in countries with a civil law system, investors are more likely to use "sparrow in hand" strategies — i.e., forcing companies to pay dividends up to date, assuming that the existing legal system does not give them confidence in the possibility of obtaining additional profits in the future.

La Porta et al. (2000, 9–15) verified the hypothesis of the dependence of the level of dividend payments on the legal system on the basis of data on 4,103 companies from 33 countries, including 12 countries applying the common law system and 21 applying the civil law system. Studies have shown that median dividend yields in countries applying the civil law system are lower than in countries applying the common law system, and the difference is statistically significant. In the case of the dividend payout ratio, which is the quotient of dividend to profit, the difference is significant at the level of 0.1, and the median of dividend payout ratios in the civil law countries is by 12.3 p.p. lower than in the common law countries. In addition, the authors built linear models of dividend yields, in which the independent variable was a discrete variable taking a value of 1 if the commercial company law (or commercial code) of a given country was based on civil law and a value of 0 if the commercial company law (or commercial code) of a given country was based on common law (Civil Law variable). In all estimated models, the coefficients on this variable were negative and significant at level 0.01 (La Porta et al. 2000, 20–21).

In 2007, the studies carried out by La Porty and others led to the formation of a team consisting of Söhnke Bertram, Philips Brown, Janice How and Peter Verhoeven. The team conducted research using a set of 255.4 thousand observations made between 1984 and 2006 on companies from 43 countries (14 applying the common law system and 29 applying the civil law system). The average dividend payout ratio between 1984 and 2000 in the countries applying the common law system was 42.7% and was significantly higher than the average dividend payout ratio in the countries applying the civil law system (33.6%). Between 1984 and 2000, the average share of companies paying dividends in the common law was 74.3% and was significantly higher (at p level 0.05) than the share of the companies paying dividends in the civil law countries (62.9%). At the beginning of the 21st century, there is still a higher share of companies paying dividends in common law countries, but the predominance of these countries has been decreasing and is statistically insignificant.

The relationship between the payment policy and the legal systems of the 15 countries that were members of the European Union before May 2005 (the countries of the so-called "old" Union) was studied by (von Eije and Megginson 2009). For the analysis 5,654 industrial and transport companies were selected, of which 2,136 operated in two countries with a common law system (United Kingdom and Ireland), while 3,518 in the remaining 13 countries with a civil law system. In total, the sample included 52,387 observations (companies – years) from 1989 to 2006, of which 18,757 were related to common law countries and 33,630 to civil law countries. Throughout the analyzed period, there was a decrease in the share of companies paying dividends in the countries using both systems. Also, the value of dividends paid per company was much higher in the countries with the common law system.

The research by Brockman and Unlu (2009) not only confirmed the much greater rights of minority shareholders in the common law system countries but also showed that in countries with this legal system greater rights were enjoyed by creditors as well. The research also confirmed a higher share of companies paying dividends and a higher dividend payout ratio in countries with a common law system. Between 1990 and 2006, the average share of dividend-paying companies in civil law countries was 68.6%, while in common law countries 78.8%. In turn, the average dividend yield ratio was respectively 1.7% and 2.3% although in the case of both indicators of the dividend policy, the differences were not significant (at p level 0.05).

An unquestionable precursor of the research on the factors of the value of payments was John Lintner, who in 1956 proposed a partial adjustment model, allowing for the estimation of the target dividend payout ratio and the speed of adjustment.

In Lintner's model, the dependent variable is the value of the dividend, most often scaled by assets and less often by capitalization or equity. Independent variables, scaled like the dependent variable income and lagged by one year dividend, which is most often measured by net profit, but also by cash-flow (Allen, Bernardo, and Welch 2000; Andres et al. 2009; Fama and Babiak 1968) or the profit to be distributed (Kowerski 2018, 64). This model is still used today to analyze the dividend policy of companies, while the least squares method used by Lintner has been replaced by more effective estimation methods, and the model itself has been modified (Fernau and Hirsch 2019).

2 Methodology of the study

2.1 Data

The data is sourced from research by Janus Henderson Investors (JHI) published in quarterly reports since 2009.[8] In all of its reports JHI has collected data on dividends paid (in USD) by the world's largest 1,200 companies by market capitalization, which operate in 48 countries. This makes it possible to measure the progress global firms have made in paying their investors returns (in nominal values) on their capital since 2009. Data on dividend payments are broken down by economic regions, industries and sectors proposed by JHI. A ranking of 20 companies — the largest payers of dividends in the world — is also published.

For the purposes of this study, using detailed data an additional economic regionalization as well as geographical and legal regionalization were proposed. JHI uses economic regionalization by dividing the world into subregions: Emerging markets, Europe (except United Kingdom), United Kingdom, USA and Canada, Asia and Pacific (except Japan), and Japan. In fact, the other subregions, apart from Emerging markets, belong to Developed markets. Therefore, changes in dividend payments were also analyzed in all countries of Developed markets. Geographical regionalization is a division into continents and legal regionalization is a division into Common law and Civil law subregions.

8. Janus Henderson Global Dividend Index, Editions: 1–33, available at: https://www.janushenderson.com/en-gb/adviser/jh-global-dividend-%20index/.

Table 2. Countries belonging to specified regions

			Regions			
No.	Country	NoY[a]	Geographic	Economic		Legal
1	Australia	13	Australia	Asia and Pacific ex Japan	Developed markets	Common law
2	Austria	13	Europe	Europe ex UK	Developed markets	Civil law
3	Belgium	13	Europe	Europe ex UK	Developed markets	Civil law
4	Brazil	13	South America	Emerging markets	Emerging markets	Civil law
5	Canada	13	North America	USA and Canada	Developed markets	Common law[b]
6	Chile	13	South America	Emerging markets	Emerging markets	Civil law
7	China	13	Asia	Emerging markets	Emerging markets	Civil law
8	Colombia	12	South America	Emerging markets	Emerging markets	Civil law
9	Czech Republic	13	Europe	Emerging markets	Emerging markets	Civil law
10	Denmark	13	Europe	Europe ex UK	Developed markets	Civil law
11	Egypt	3	Africa	Emerging markets	Emerging markets	Civil law
12	Finland	13	Europe	Europe ex UK	Developed markets	Civil law

Continues on next page

Table 2 continued

No.	Country	NoY[a]	Regions			
			Geographic	Economic		Legal
13	France	13	Europe	Europe ex UK	Developed markets	Civil law
14	Germany	13	Europe	Europe ex UK	Developed markets	Civil law
15	Greece	2	Europe	Europe ex UK	Developed markets	Civil law
16	Hong Kong	13	Asia	Asia and Pacific ex Japan	Developed markets	Common law
17	Hungary	2	Europe	Emerging markets	Emerging markets	Civil law
18	India	13	Asia	Emerging markets	Emerging markets	Common law[c]
19	Indonesia	13	Asia	Emerging markets	Emerging markets	Civil law
20	Ireland	13	Europe	Europe ex UK	Developed markets	Civil law
21	Israel	9	Asia	Europe ex UK	Developed markets	Common law[d]
22	Italy	13	Europe	Europe ex UK	Developed markets	Civil law
23	Japan	13	Asia	Japan	Developed markets	Civil law
24	Kuwait	1	Asia	Emerging markets	Emerging markets	Civil law
25	Luxembourg	12	Europe	Europe ex UK	Developed markets	Civil law
26	Malaysia	13	Asia	Emerging markets	Emerging markets	Civil law
27	Mexico	13	North America	Emerging markets	Emerging markets	Civil law
28	Morocco	5	Africa	Emerging markets	Emerging markets	Civil law
29	Netherlands	13	Europe	Europe ex UK	Developed markets	Civil law
30	Norway	13	Europe	Europe ex UK	Developed markets	Civil law
31	Peru	12	South America	Emerging markets	Emerging markets	Civil law
32	Philippines	13	Asia	Emerging markets	Emerging markets	Civil law
33	Poland	10	Europe	Emerging markets	Emerging markets	Civil law
34	Portugal	13	Europe	Europe ex UK	Developed markets	Civil law
35	Qatar	6	Asia	Emerging markets	Emerging markets	Civil law
36	Russia	13	Europe	Emerging markets	Emerging markets	Civil law
37	Saudi Arabia	2	Asia	Emerging markets	Emerging markets	Civil law
38	Singapore	13	Asia	Asia and Pacific ex Japan	Developed markets	Common law
39	South Africa	13	Africa	Emerging markets	Emerging markets	Common law[e]
40	South Korea	13	Asia	Asia and Pacific ex Japan	Developed markets	Civil law
41	Spain	13	Europe	Europe ex UK	Developed markets	Civil law
42	Sweden	13	Europe	Europe ex UK	Developed markets	Civil law
43	Switzerland	13	Europe	Europe ex UK	Developed markets	Civil law
44	Taiwan	13	Asia	Asia and Pacific ex Japan	Developed markets	Civil law
45	Thailand	13	Asia	Emerging markets	Emerging markets	Civil law
46	Turkey	10	Europe	Emerging markets	Emerging markets	Civil law
47	United Kingdom	13	Europe	United Kingdom	Developed markets	Common law
48	United States	13	North America	USA and Canada	Developed markets	Common law[f]

Source: Own elaboration based on reports by Janus Henderson Investors.

[a] Number of payment years

[b] Except in Quebec, where a civil law system based on French law is used.

[c] Except in Goa, Daman and Diu, and Dadra and Nagar Haveli.

[d] Also incorporates civil law and Halakha and Sharia for family law.

[e] Mixed system with company, constitution and evidence common law.

[f] Except in Louisiana, where the law is based on French and Spanish civil law.

Data on GDP in individual countries in the years 2009-2021 were obtained from the International Monetary Found database (April 2022 Edition).[9]

9. See: https://www.imf.org/en/Publications/WEO/weo-database/2022/April.

2.2 Calculation methodology

The research began with the presentation of changes in the value of dividends paid in the years 2009–2021 by the 1,200 largest companies in the world in total and in specified regions. Next, the changes in the nominal values of the dividend in year t in relation to the value of the dividend in 2009 (dividend growth rate), in the years 2010–2021 in all the analyzed cross-sections were calculated. The dividend to gross domestic product ratios (in %) for the years 2009–2021 were also calculated for individual countries, regions and subregions. The dividend growth rate in year t in relation to the value of the dividends in 2009 were used to estimate linear trend models in which the COVID-19 pandemic in 2020 was taken into account. Applied model can be represented as follows

$$Y_{it} = \alpha_{0i} + \alpha_{1i}t + \alpha_{2i}\mathrm{COV} + \varepsilon_{it} \tag{1}$$

where:

Y_{it} — dividend growth rate — change in the value of the dividend in year t in relation to the value of the dividend in 2009 in the i-th subregion (%),
t — time variable taking the values of natural numbers $t = 1, 2, ..., 12$,
COV — discrete variable taking the value 1 for 2020 and the value 0 for the remaining years,[10]
ε_{it} — random disturbance, and
$\alpha_{0i}, \alpha_{1i}, \alpha_{2i}$ — model structural coefficients.

The model was estimated for each of the specified subregions using the ordinary least squares method and tested using the White heteroscedasticity test as well as the Durbin-Watson test for autocorrelation of random disturbances. If heteroscedasticity occurred, the model was again estimated using the heteroscedasticity corrected method. If autocorrelation of random disturbances occurred, the model was again estimated using Prais-Winsten or Cochrane-Orcutt methods. When the Durbin-Watson statistic fell in the inconclusive region and there was no way to make a decision based on the D-W test, the t-Student significance test of the autocorrelation coefficient of the first order was applied (Nowak 2002, 100–101):

$$t = \frac{|r_1|\sqrt{n-3}}{\sqrt{1-r_1^2}}, \tag{2}$$

where r_1 is the first order autocorrelation coefficient. The normality error was tested with chi-square statistic and the stability of coefficients with CUSUM test. The R-squared coefficient and Adjusted R-squared coefficient were used to assess the degree of fitting the trend model. In addition, the significance of the multiple correlation coefficient (R) was verified using the F test.

The estimated value of the parameter α_{1i} informs by how many percentage points on average during the year the growth rate of dividend payment in the i-th subregion has changed. The estimated value of the parameter α_{2i} informs by how many percentage points the growth rate of dividend payment has changed as a result of the COVID-19 epidemic in 2020.

The collected data on the value of payments in individual countries in the years 2009–2021 allowed the author to construct an unbalanced panel of 541 observations.[11] The panel's balance rate was 86.7%. This made it possible to estimate, following the Lintner (1956) model, a dynamic panel model of partial adjustments of the value of the dividend paid in relation to the value of the gross domestic product:

$$\mathrm{DIV}_{it} = \alpha_0 + \alpha_1 \mathrm{DIV}_{it-1} + \alpha_2 \mathrm{GDP}_{it} + \varepsilon_{it} \tag{3}$$

where:

DIV_{it} — dividend value in i-th country in year t (USD billion),
GDP_{it} — Gross domestic product in i-th country in year t (USD billion), and
ε_{it} — random disturbance.

10. It is true that the epidemic lasted the whole of 2021, but the observation of the companies' behavior and their decisions regarding payments leads to the conclusion that in 2021 the epidemic no longer had a significant impact on dividends payments.

11. In 13 countries, in some years, none of the companies was among the 1,200 largest in the world.

The model was estimated with the two-step system Generalized Method of Moments (GMM) estimator, proposed by Arellano and Bover (1995) and Blundell and Bond (1998), and developed for panel data by Arellano and Bond (1991). The quality of estimation was verified by:

- assessment of the significance of coefficients,
- tests for AR(1) and AR(2) errors, and
- square of the correlation coefficient between actual and fitted values of dependent variable.

Estimated values of coefficients make it possible to calculate the target ratio of dividend to gross domestic product $\tau = \alpha_2/(1-\alpha_1)$ and speed of adjustment $\alpha = 1-\alpha_1$.

Calculations were made using the GRETL program (Cottrell and Lucchetti "Jack" 2022; Kufel 2011).[12]

3 Regionalization of the changes in dividend payments in the world. Results of estimations

3.1 Changes in dividend payments in the world

In 2021 one thousand two hundred of the world's largest companies paid dividends worth USD 1,299.6 billion. Comparing this value with the data of Damodaran (see tab. 1), who collected data from 47.6 thousand companies, it can be concluded that the analyzed companies, which account for 2.5%, paid 60.4% of global dividends. This confirms the previously discussed phenomenon of strong concentration of payouts. This phenomenon is further illustrated by the fact that the world's top 20 dividend payers paid USD 245.2 billion,[13] which is 11.4% of all world's payments. In other words, every ninth dollar paid in the world in the form of a dividend comes from one of the twenty largest payers in the world.

In 2021, the top 20 dividend payers in the world included companies from 8 countries (USA — 11, Australia — 3, United Kingdom — 2, China — 2, and South Korea, Brasilia, Taiwan, and Switzerland — one each).[14] However, in 2021, the overrepresentation of dividend payments by mining companies (metals, coal, diamonds) from Australia and the United Kingdom was reported, which was previously not observed and which was caused by the pandemic in the previous year.[15] That is why it is also worth looking at 2020, when among the first twenty largest payers there were companies from 7 countries (USA — 13, Switzerland — 3, China — 2, and United Kingdom, the Netherlands, Taiwan, and France[16] — one each).[17]

In the years 2010–2021, there was a very rapid increase in the nominal value of dividends paid by the largest companies in the world: on average by 6% annually. Between 2014 and 2021, this increase amounted to 38.7%, which was almost 10 p.p. lower than estimations for the same period based on Damodaran's data. Therefore, it can be concluded that the dynamics of payments by smaller companies was even greater than that recorded by the largest companies. The dividends to GDP rate for the largest companies grew even faster (on average by 15% annually). The rate of total dividend payments by the 1,200 largest companies in the years 2009–2021 to GDP in 2021 in the 48 countries surveyed was 14.2%.

The estimated linear trend containing COV variable of the total dividend growth rate has significant coefficients on both variables. There are no heteroscedasticity and autocorrelation phenomena in the model. The coefficients are stable and the random disturbances have a normal distribution. The model describes the variability of the dependent variable at 94.7%. The high quality of the estimation allows for a proper interpretation of changes in dividends payments by the largest com-

12. See also: http://www.kufel.torun.pl/.

13. See: "Janus Henderson Global Dividend Index. Edition 33." https://cdn.janushenderson.com/webdocs/H049590_0222+-+English+Global.pdf (accessed 2022-06-07), page 14.

14. The number of the companies is 22 due to the fact that two are registered in two countries (BHP Group and Rio Tinto plc — Australia and United Kingdom).

15. See: "Janus Henderson..., op. cit., pages 4 and 14.

16. In 2020, Total changed its registration from French to European.

17. Similarly, like in 2021, two companies are registered in two countries (Royal Dutch Shell — United Kingdom and Holland, Phillip Morris International Inc. — Switzerland and USA).

Table 3. Dividend payments of 1,200 world's largest companies in the years 2009–2021

Year	Value of dividends (USD billion)	Dividends to GDP (%)	Dividend growth rate (2009 = 0%)
2009	647.4	1.18	n/a
2010	690.4	1.11	6.6
2011	839.8	1.24	29.7
2012	909.3	1.32	40.4
2013	937.2	1.32	44.7
2014	1,035.5	1.40	59.9
2015	1,027.8	1.49	58.7
2016	1,025.0	1.46	58.3
2017	1,108.0	1.48	71.1
2018	1,217.7	1.53	88.1
2019	1,260.8	1.57	94.7
2020	1,113.6	1.44	72.0
2021	1,299.6	1.49	100.7
Coefficient of variation (%)	20.0	10.30	n/a
Average annual growth rate (%)	6.0	15.00	n/a

Source: Own calculations based on reports by Janus Henderson Investors.

Table 4. The results of the estimation of linear trend models containing the pandemic variable (COV) of the total dividend growth rate in the years 2010–2022 (2009 = 100); ordinary least squares method

	Total	
Variables and statistics	**Coefficient**	***P***
Const	10.730	0.0524
t	7.990	< 0.0001
COV	−26.605	< 0.0001
R-squared	0.9469	
Adjusted R-squared	0.9351	
$F(2,9)$	83.495	< 0.0001
Akaike criterion	83.31	
Schwarz criterion	84.76	
White's test — H_0: No heteroskedasticity LM statistic	3.405	0.3334
Durbin-Watson test — H_0: No autocorrelation d statistic	1.388	0.0765
Normality test — H_0: Error is normally distributed. Chi-square(2) statistic	0.910	0.6344
CUSUM test — H_0: No change in coefficients. Harvey-Collier $t(8)$ statistic	−2.296	0.0508

Source: Own calculations with GRETL.

panies. Between 2009 and 2021 the growth rate of dividends increased by an average of 8 p.p. per year. However, the upward trend was disrupted by the COVID-19, which in 2020 caused a reduction in growth by 26.6 p.p. Many businesses in the most affected sectors, such as tourism and hospitality, aviation, and retail, had to cut or suspend dividend payments entirely in 2020 to preserve their cash resources and the viability of their businesses. Any company that received government assistance to stay afloat found it particularly difficult to justify maintaining their dividend payments to shareholders (Bateman 2020). Banks recorded a particularly large reduction in dividend payments. Among the world's top 1200 companies, banks reduced their dividends from

USD 201.6 billion in 2019 to USD 126.6 billion in 2020 (by 37.2%). For instance, the UK's biggest banks Barclays, Royal Bank of Scotland, HSBC, Lloyds, Santander, and Standard Chartered all suspended dividend payments and share buybacks for 2019 and throughout 2020 (Bateman 2020). Royal Dutch Shell, which was the world's biggest individual dividend payer in the years 2016–2019 had to cut its dividend for the first time since WWII.

3.2 Changes in dividend payments in geographical regions

In the analyzed period, the largest payments were made by companies from North America. Dividend payments on this continent increased from USD 229.4 billion in 2009 to USD 579.1 billion in 2021 (by 152.4%). The second continent in terms of the value of payments was Europe, where, however, at that time payments increased by only 32.9% (to USD 354.5 billion), but payments in Europe were characterized by the least volatility. Dividend payments grew the fastest in Asia (by 191.2%) and the slowest in Africa (by only 5.1%).

Table 5. Dividends payments by geographical regions (continents) in the years 2009–2021 (USD billion)

Year and indicator	Africa	Asia	Australia	Europe	North America	South America
2009	7.8	92.1	30.0	266.6	229.4	21.6
2010	7.8	127.0	40.6	265.2	227.8	21.8
2011	12.5	154.1	48.6	326.4	268.4	29.8
2012	12.3	155.2	51.7	320.1	341.5	28.5
2013	10.7	162.6	55.2	333.9	351.0	23.7
2014	8.5	172.4	50.4	384.7	396.0	23.4
2015	7.8	178.3	50.1	328.1	446.1	17.4
2016	5.4	191.2	44.9	326.4	449.1	8.0
2017	6.2	218.1	53.3	338.9	480.9	10.6
2018	6.5	247.4	53.8	382.6	514.0	13.4
2019	5.4	250.9	58.8	391.3	540.9	13.5
2020	3.3	248.1	33.9	261.2	553.9	13.2
2021	8.2	268.2	63.3	354.3	579.1	26.5
Number of countries	3	15	1	22	3	4
Coefficient of variation of dividends' values (%)	38.5	39.2	34.5	30.1	41.8	43.7
Dividend growth rate in 2021 (2009 = 0%)	5.1	191.2	111.0	32.9	152.4	22.7
Average annual dividends' growth rate (%)	0.4	9.3	6.4	2.4	8.0	1.7
Dividends to GDP ratio in 2021 (%)	2.0	0.8	3.9	1.7	2.2	1.1
Change of dividends to GDP ratio in the years 2009–2021 (p.p.)	0.7	0.2	0.9	0.3	0.8	0.1
Sum of dividends in 2009–2021 to GDP in 2021 (%)	10.8	7.5	38.9	18.3	20.5	10.2

Source: Own calculations based on reports by Janus Henderson Investors.

Dividends to GDP ratios in the years 2009–2021 also grew — most in North America. On the other hand, the sum of dividends paid in the years 2009–2021 to GDP in 2021 was by far the highest in Australia, where the dividends paid at that time corresponded to as much as 38.9% of the 2021 GDP. In 2021 in North America it was 20.5% and in Europe 18.3%. In Asia, on the other hand, despite the fact that dividend payments were growing the fastest, their value in relation to GDP was the smallest and amounted to only 7.5% of 2021 GDP. This means that there is still a lot of potential for dividend growth on this continent.

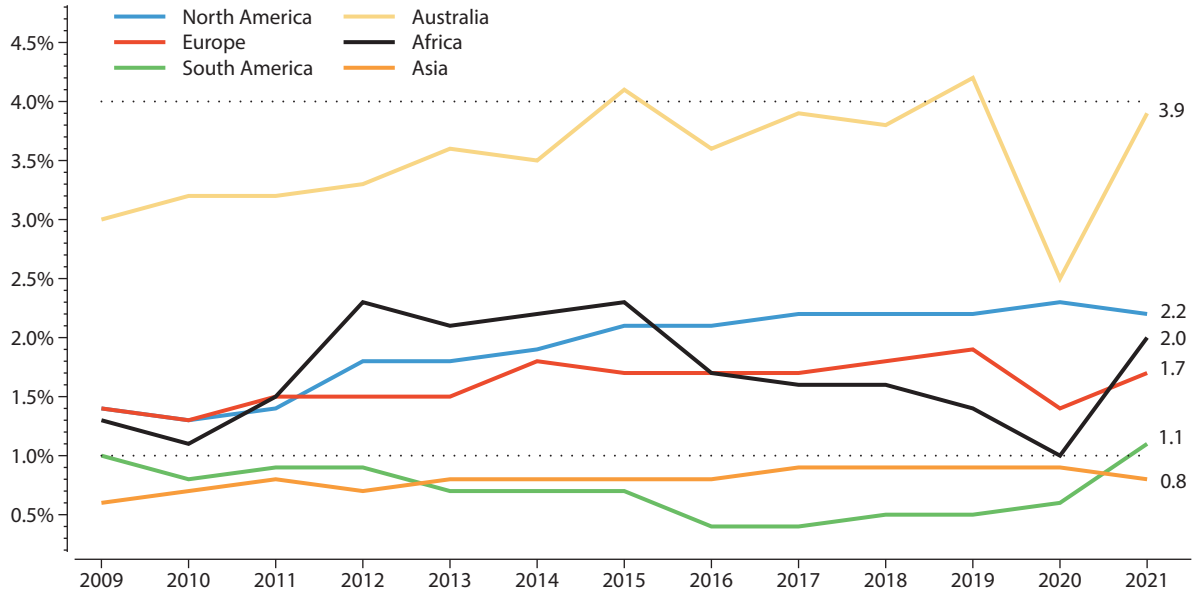

Figure 2. Changes of dividends to GDP ratio by geographical regions in the years 2009–2021

Source: Own elaboration based on reports by Janus Henderson Investors.

Linear trends containing the pandemic variable (COV) of the dividend growth rate in geographical regions were characterized by homoscedasticity of random disturbances, but with the exception of Europe and Total models, autocorrelation of random disturbances occurred. Therefore, the Prais-Winsten method was used, which significantly reduced the values of autocorrelation coefficients of the first order. In the case of Total,[18] Asia and South America, the Durbin-Watson statistic fell in the inconclusive region but the insignificance of the autocorrelation coefficients of the first order was confirmed by *t*-Student test. The variability of dependent variables is best explained by models for North America (97.8%) and Asia (96.9%). Multiple correlation coefficients in all the models are statistically significant.

In the models for Africa and South America, the coefficients turned out to be statistically insignificant, so it was not possible to explain the changes of the dividend growth rates in these regions. This was probably due to the fact that these changes were multidirectional (high values of coefficients of variation, especially in South America) with small average annual growth rates (especially in Africa). On other continents, the coefficients on the time variable were positive and statistically significant, which means significant increases in dividends paid.

In North America, between 2010 and 2021 the dividend growth rate increased by an average of 13.8 p.p. per year and in Asia by 8 p.p. In Europe it was only 2.7 p.p. In all the models, the coefficients on the COV variable were negative, which could mean a negative impact of the pandemic on the increments of dividends paid. However, it was only in the models for Australia and Europe that the coefficients proved to be statistically significant, which means that only on these two continents did the pandemic significantly reduce the dividends paid in 2020 and they were so large that they caused a significant, negative impact on dividend payments around the world (see Total model in table 4).

The calculations confirmed the part of the hypothesis that says that in the second decade of the twenty-first century, the dividend growth rate of the world's 1,200 largest companies differed depending on the geographical regions to which the analyzed companies belonged.

18. The results of the estimation of the Total payments model with the least square method are set out in section 3.1. Table 6 (on next page) shows the results of the estimation of the Total payments model with the Prais-Winsten method for comparability with geographical regions models (estimated with the Prais-Winsten method). The results of both estimations are very similar, which is due to the lack of autocorrelation of random disturbances in the model estimated with the least square method.

Table 6. The results of the estimation of linear trend models containing the pandemic variable (COV) of the dividend growth rate in geographical regions in the years 2010–2021 (2009 = 0%). Prais-Winsten method

	Total		Africa		Asia		Australia		Europe		North America		South America	
	Coeff.	***P***	**Coeff.**	***P***	**Coeff.**	***P***	**Coeff.**	***P***	**Coeff.**	***P***	**Coeff.**	***P***	**Coeff.**	***P***
Const	10.300	0.0609	29.013	0.2467	23.849	0.0363	40.622	0.0089	11.761	0.1083	−2.864	0.6877	−2.730	0.9463
t	8.020	< 0.0001	−3.762	0.2592	14.114	< 0.0001	5.312	0.0102	2.660	0.0210	13.752	< 0.0001	0.128	0.9792
COV	−26.316	0.0067	−44.989	0.0847	−11.805	0.2293	−89.166	< 0.0001	−43.069	0.0059	−4.395	0.6027	−31.728	0.1575
R-squared	0.9479		0.6160		0.9690		0.7892		0.6271		0.9777		0.5452	
Adjusted R-squared	0.9363		0.5306		0.9622		0.7424		0.5442		0.9727		0.4441	
$F(2,9)$	62.652	< 0.0001	3.061	0.0968	37.408	< 0.0001	23.747	0.0003	7.599	0.0117	84.778	< 0.0001	1.181	0.3502
Durbin-Watson test H_0: No autocorrelation. d statistic	1.510	d_L: 0.812 d_U: 1.579	1.613	d_L: 0.812 d_U: 1.579	1.561	d_L: 0.812 d_U: 1.579	1.851	d_L: 0.812 d_U: 1.579	1.666	d_L: 0.812 d_U: 1.579	1.622	d_L: 0.812 d_U: 1.579	1.218	d_L: 0.812 d_U: 1.579
t-Student test for significance of first order autocorrelation coefficient r	0.056	0.8780	0.115	0.7521	0.217	0.5474	0.038	0.9180	−0.004	0.9921	0.031	0.9319	0.373	0.2880
Normality test H_0: Error is normally distributed. Chi-square(2) statistic	0.706	0.7027	1.907	0.3854	3.522	0.1718	1.605	0.4483	0.926	0.6293	0.552	0.7587	2.057	0.3575

Source: Own calculations with GRETL.

3.3 Changes in dividend payouts in economic regions

Among the 1,200 largest companies in the world, companies from Developed markets dominate. Although in the analyzed period the value of payments of companies from Emerging markets grew faster (average annual 8.3% vs. 5.7%), in 2021 the share of Emerging markets in total payouts of large companies was only 12.1%. At this point, reference should be made to Damodaran's data given in chapter 1, which also showed faster growth in emerging markets, but the share of these markets was estimated at as much as 42%. Such a significant difference, in my opinion, arises from two issues. The first is the definitional difference. Damodaran, unlike JHI, classifies all Asian countries outside of Japan as emerging markets, while JHI defines Hong Kong, Singapore, South Korea and Taiwan as developed markets, which, in my opinion, is a more accurate solution. If these four countries were added to the emerging markets by JHI, the value of these "new" emerging markets in 2021 would amount to USD 257.4 billion and their share would be 19.8%. This is still twice less as Damodaran's.

Table 7. Difference between Damodaran's and Janus Henderson Investors' estimations in 2021

Specification	Damodaran	JHI (1200) companies	Difference	JHI in Damodaran (%)
Total	2,150.8	1,299.6	851.2	60.4
Emerging markets	903.0	257.4[a]	645.6[a]	28.5[a]
Developed markets	1,247.8	1,042.2	205.6	83.5

Source: Own calculation based on Damodaran and JHI.
[a]Including Hong Kong, Singapore, South Korea, and Taiwan.

It is here that the second issue arises. Emerging markets are dominated by small companies (especially compared to the world's largest 1,200 companies), which are not covered by JHI statistics, and which, according to estimates, paid as much as USD 645.6 billion in dividends in 2021. In turn, on Developed markets, such companies paid dividends worth USD 205.6 billion. Hence, in 2021, the share of large companies in emerging market payments was 28.5%, while the share of large companies in Developed markets payouts was 83.5%.

Despite the higher payments growth in the case of emerging markets companies which were among the world's 1,200 largest between 2010 and 2021, emerging market characteristics are still much worse. The sum of payments by companies from 22 Emerging markets countries in JHI research in the analyzed period accounted for only 4.4% of GDP in 2021. In developed markets, it was 20.7%. Between 2010 and 2021, the dividends to GDP ratio in Emerging markets increased by only 0.1 p.p., while in developed markets by 0.7 p.p.

In the analyzed period, the difference between dividends to GDP ratios of Emerging and Developed markets was significant ($p < 0.0001$), which was confirmed by two-sample t-test with unequal variance. On the other hand, it should also be noted that the developed market is not homogeneous due to the dividend policy of the largest companies. In the analyzed period, the growth rate of payments of USA and Canada, and Asia and Pacific (except Japan) was more than four times higher than in Europe.

Linear trends containing the pandemic variable (COV) of the dividend growth rate in economic regions were characterized by the homoscedasticity of random disturbances, but in the case of Emerging markets and Japan models, autocorrelation of random disturbances occurred. Therefore, for these two regions, the Prais-Winsten method (Emerging markets) and the Cochrane-Orcutt method (Japan) were additionally used, which reduced the autocorrelation coefficients of the first order. However, in both cases, Durbin-Watson statistic fell in the inconclusive region and only for Emerging markets the insignificance of the autocorrelation coefficient of the first order was confirmed by t-Student test.

The Developed markets model ($R^2 = 0.95$) turned out to be much better fitted to empirical data than the Emerging markets model ($R^2 = 0.58$). Also, among the developed markets, it was the USA and Canada ($R^2 = 0.98$) and Asia and Pacific except Japan ($R^2 = 0.91$) models that fitted better

Table 8. Dividend payments by economic regions in the years 2009–2021 (USD billion)

Year	Emerging Markets	Developed Markets	Europe ex UK	United Kingdom	USA and Canada	Asia and Pacific ex Japan	Japan
2009	60.7	586.7	186.6	74.1	227.0	62.9	36.1
2010	82.2	608.2	177.8	77.1	225.3	87.6	40.4
2011	106.9	732.9	222.6	88.4	264.8	107.6	49.5
2012	116.1	793.2	196.1	101.9	337.9	106.0	51.3
2013	129.1	808.1	204.3	103.1	342.0	112.3	46.4
2014	114.0	921.5	229.4	135.2	392.2	115.6	49.1
2015	110.9	916.9	210.9	98.4	441.2	113.8	52.6
2016	84.1	940.9	220.6	95.3	444.8	115.5	64.7
2017	100.5	1,007.5	221.8	98.4	475.7	141.6	70.0
2018	122.1	1,095.6	252.9	102.7	509.8	151.1	79.1
2019	132.4	1,128.4	247.5	108.8	535.5	151.5	85.1
2020	124.7	988.9	168.5	65.2	550.6	123.9	80.7
2021	157.4	1,142.2	229.3	94.2	573.3	163.3	82.1
Number of countries	22	26	17	1	2	5	1
Coefficient of variation (%)	22.5	20.4	12.0	18.3	29.7	23.1	28.3
Dividend growth rate in 2021 (2009 = 0%)	159.3	94.7	22.9	27.1	152.6	159.6	127.4
Average annual growth rate (%)	8.3	5.7	1.7	2.0	8.0	8.3	7.1
Dividends to GDP ratio in 2021 (%)	0.5	2.0	1.4	3.0	2.3	3.3	1.7
Change in dividends to GDP ratio in the years 2009–2021 (p.p.)	0.1	0.7	0.1	−0.1	0.9	1.0	1.0
Sum of dividends in 2009–2021 to GDP in 2021 (%)	4.4	20.7	16.3	39.0	21.3	31.1	15.9

Source: Own calculations based on reports by Janus Henderson Investors.

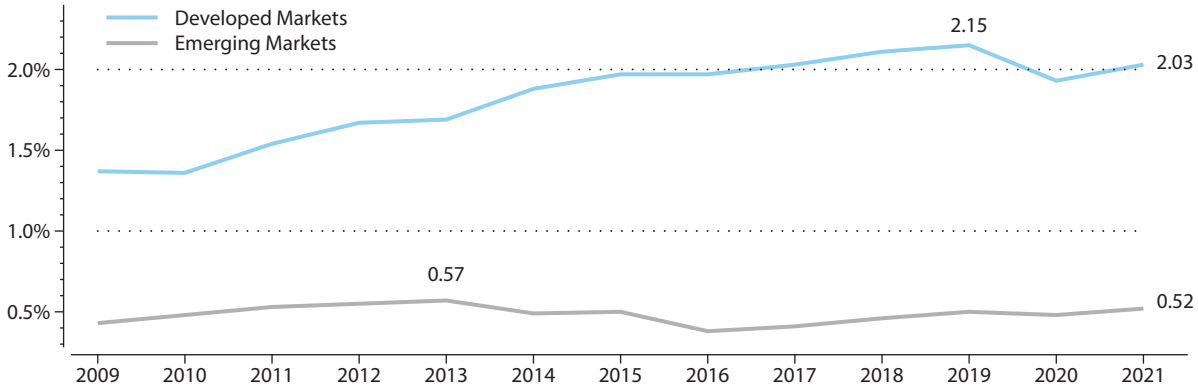

Figure 3. Changes in dividends to GDP ratio by economic regions in the years 2009–2021

Source: Own elaboration based on reports by Janus Henderson Investors.

Table 9. The results of the estimation of linear trend models containing the pandemic variable (COV) of the dividend growth rate in economic regions in the years 2010–2021 (2009 = 0%); ordinary least squares method

	Emerging Markets		Developed Markets		Europe ex UK		United Kingdom		North America		Asia-Pacific		Japan	
	Coeff.	***P***	**Coeff.**	***P***	**Coeff.**	***P***	**Coeff.**	***P***	**Coeff.**	***P***	**Coeff.**	***P***	**Coeff.**	***P***
Const	50.539	0.0114	6.612	0.1811	2.352	0.5623	27.626	0.071	−2.830	0.6705	34.381	0.0001	−3.523	0.7246
t	6.161	0.0295	8.179	< 0.0001	2.498	0.0057	1.273	0.4416	13.914	< 0.0001	10.349	< 0.0001	11.874	< 0.0001
COV	−12.870	0.4560	−28.026	< 0.0001	−39.531	< 0.0001	−53.643	< 0.0001	−7.668	0.1216	−51.236	< 0.0001	−3.542	0.7004
R-squared	0.3759		0.9525		0.7069		0.3886		0.9752		0.9073		0.8949	
Adjusted R-squared	0.2372		0.9420		0.6417		0.2527		0.9697		0.8867		0.8716	
$F(2,9)$	5.974	0.0223	95.942	< 0.0001	111.596	< 0.0001	49.917	< 0.0001	346.124	< 0.0001	114.286	< 0.0001	94.614	< 0.0001
Akaike criterion	118.20		82.43		86.91		108.32		88.50		96.48		103.25	
Schwarz criterion	119.65		83.88		88.36		109.78		89.95		97.94		104.70	
White's test H_0: No heteroskedasticity. LM statistic	1.165	0.7614	5.064	0.1672	5.149	0.1612	0.736	0.8646	3.573	0.3114	2.151	0.5417	2.263	0.5196
Durbin-Watson test H_0: No autocorrelation. d statistic	0.965	0.0065	1.485	0.1099	2.312	0.6173	1.478	0.1070	1.344	0.0638	1.499	0.1151	0.916	0.0042
Normality test H_0: Error is normally distributed. Chi-square(2) statistic	1.170	0.5571	1.008	0.6041	1.401	0.4964	8.011	0.0182	0.193	0.9079	2.094	0.3510	0.847	0.6549
CUSUM test H_0: No change in coefficients. Harvey-Collier $t(8)$ statistic	−0.321	0.7566	−2.256	0.0541	−1.214	0.2592	−2.563	0.0335	−4.512	0.0020	−0.490	0.6373	0.792	0.4511

Source: Own calculations with GRETL.

Table 10. The results of the estimation of linear trend models containing the pandemic variable (COV) of the dividend growth rate in Emerging markets and Japan in the years 2010–2021 (2009 = 0%). Prais-Winsten and Cochrane-Orccut metods

	Emerging markets Prais-Winsten, $T = 12$		Japan Cochrane-Orccut, $T = 11$	
Variables and statistics	**Coefficient**	***P***	**Coefficient**	***P***
Const	34.0413	0.2982	−2.9695	0.9175
t	9.1318	0.0456	11.5925	0.0061
COV	−32.8757	0.1542	−7.0146	0.5937
R-squared	0.5754		0.9088	
Adjusted *R*-squared	0.4811		0.8860	
F(2,8)	1.663	0.2429	6.826	0.0186
Durbin-Watson test H_0: No autocorrelation *d* statistic	1.486	d_L: 0.812 d_U: 1.579	1.182	d_L: 0.758 d_U: 1.604
t-Student test for significance of first order autocorrelation coefficient *r*	0.2456	0.0772	0.3245	0.0253

Source: Own calculations with GRETL.

than others. The United Kingdom model ($R^2 = 0.39$) turned out to be the worst fitting. Except for the United Kingdom model, in all the models the error is normally distributed and, except the United Kingdom and USA and Canada models, there is no change in coefficients (CUSUM test). The analysis of the statistics of the estimated models indicates that the lowest quality was characterized by the Japan (autocorrelation) and United Kingdom models. Inference from these models can be particularly inaccurate.

In the Emerging and Developed markets models, the parameters on the time variable turned out to be statistically significant, with a slightly higher value of the coefficient on Emerging markets (the growth rate of dividends increased by an average of 9.1 p.p. per year). In both models, the coefficients on the COV variable was negative, but it turned out to be significant only for Developed markets. Thus, the pandemic has had a significant impact on the increments of dividends paid only on developed markets. The estimated models for developed markets subregions confirmed the earlier observation that developed markets did not behave similarly during the analyzed period. COVID-19 had a significant negative impact on the increments of paid dividends, lowering them in 2020 in the United Kingdom by 53.6 p.p.,[19] and in Asia and Pacific ex Japan by 51.2 p.p. The impact of the pandemic in USA and Canada and in Japan was insignificant.[20]

The calculations confirmed the part of the hypothesis that says that in the second decade of the twenty-first century, the dividend change rate of the world's 1,200 largest companies differed depending on the economic regions to which the analyzed companies belonged.

3.4 Changes in dividend payments in legal regions

Dividend payments by companies from common law countries in 2021 were by 63.5% higher than those by civil law countries and in the years 2010–2021 they increased annually on average by 1.8 p.p. faster. In 2021 in common law countries, the dividends to GDP ratio was significantly higher than in civil law countries and grew faster between 2009 and 2021. In common law countries, the sum of dividends paid between 2009 and 2021 compared to GDP in 2021 was more than twice as high as in civil law countries. In the analyzed period, the difference between dividends to GDP ratios of civil and common law countries was significant ($p < 0.0001$), which was confirmed by two-sample *t*-test with unequal variance. The above observations confirm the estimated models of linear trends containing the pandemic variable of the dividend growth rate for both law regions.

19. With objections to the low quality of the United Kingdom model.
20. With objections to the low quality of the Japan model.

Table 11. Dividend payments by legal regions in the years 2009–2021 (USD billion)

Year and indicators	Civil law	Common law
2009	278.8	368.7
2010	298.0	392.2
2011	377.5	462.3
2012	358.2	551.1
2013	372.6	564.5
2014	387.3	648.1
2015	376.5	651.3
2016	378.0	647.0
2017	405.4	702.6
2018	471.8	745.9
2019	481.1	779.7
2020	390.2	723.4
2021	493.3	806.3
Number of countries	39	9
Coefficient of variation (%)	16.3	23.0
Dividend growth rate in 2021 (2009 = 0%)	76.9	118.7
Average annual growth rate (%)	4.9	6.7
Dividends to GDP ratio in 2021 (%)	1.0	2.4
Change in dividends to GDP ratio in the years 2009–2021 (p.p.)	0.1	0.7
Sum of dividends in 2009–2021 to GDP in 2021 (%)	9.6	23.3

Source: Own calculations based on reports by Janus Henderson Investors.

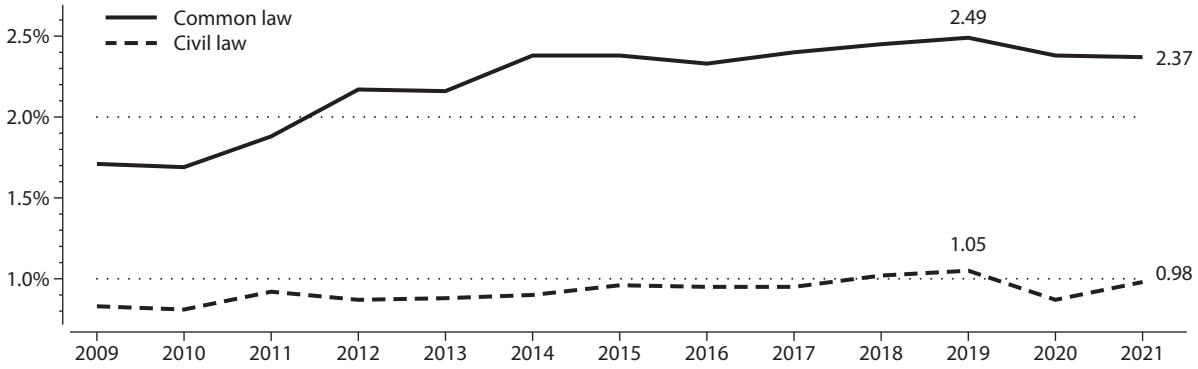

Figure 4. Changes in dividends to GDP ratio by legal regions in the years 2009–2021

Source: Own elaboration based on reports by Janus Henderson Investors.

The estimated models are characterized by the significance of coefficients on both variables. The Common law model fits empirical data more closely ($R^2 = 0.949$ vs. $R^2 = 0.835$). In both models, there is no heteroscedasticity of random disturbances. Due to the autocorrelation of random disturbances in the Civil law model estimated with the least squares method, the Civil law model was additionally estimated with the Prais-Winsten method, which removed autocorrelation and only minimally changed the coefficients values.

The results of the estimation confirmed that in the years 2010–2021 the growth rate of dividends in common law countries was higher (increased by an average of 9.8 p.p. per year) than in civil law countries (increased by an average of 5.6 p.p. per year). The increase in dividend payments was significantly disrupted by the COVID-19 pandemic in the countries of both legal systems. COVID-19 had a significant negative impact on the increments of paid dividends, lowering them in civil law countries by 30.9 p.p. and in common law countries by 20.2 p.p. in 2020.

Table 12. The results of the estimation of linear trend models containing the pandemic variable (COV) of the dividend growth rate in legal regions in the years 2010–2021 (2009 = 0%)

	Civil law		Common law OLS		Common law Prais-Winsten	
Variables and statistics	**Coeff.**	***P***	**Coeff.**	***P***	**Coeff.**	***P***
Const	9.469	0.0661	11.626	0.1469	10.347	0.1878
t	5.581	< 0.0001	9.812	< 0.0001	9.818	< 0.0001
COV	−30.903	< 0.0001	−23.352	0.0004	−20.178	0.0421
R-squared	0.8351		0.9422		0.9488	
Adjusted R-squared	0.7984		0.9293		0.9375	
$F(2,9)$	38.751	< 0.0001	67.584	< 0.0001	34.307	< 0.0001
Akaike criterion	89.61		89.66		n/a	
Schwarz criterion	91.07		91.11		n/a	
White's test H_0: No heteroskedasti-city. LM statistic	1.416	0.7018	3.850	0.2782	n/a	n/a
Durbin-Watson test H_0: No autocorrelation. d statistic	1.617	0.1668	1.124	0.0205	1.509	d_L: 0.812 d_U: 1.579
t-Student test for significance of first order autocorrelation coefficient r	0.1468	0.6857	0.2484	0.4890	0.0701	0.8473
Normality test H_0: Error is normally distributed. Chi-square(2) statistic	0.062	0.9693	1.127	0.5691	1.363	0.5058
CUSUM test H_0: No change in coefficients. Harvey-Collier $t(8)$ statistic	−0.662	0.5268	−3.907	0.0045	n/a	n/a

Source: Own calculations with GRETL.

Calculations carried out for the largest companies in the world confirmed that in the second decade of the twenty-first century, the previously observed trends in the policy of payments depending on the legal system were maintained (Bartram et al. 2012; Brockman and Unlu 2009; La Porta et al. 2000; von Eije and Megginson 2009). The common law system is more conducive to dividend payments. This confirms the formulated hypothesis.

3.5 Panel partial adjustment model of dividends vs. GDP

Using an unbalanced panel of countries in which the 1,200 largest companies in the world were registered, a dynamic model of partial adjustments was estimated. The estimated model is characterized by high quality. All parameters are significant at a level below 0.0001. The square of correlation coefficient between the actual and fitted value of DIV is 0.986. The autoregression tests give correct results (autoregression of the first order and the absence of autoregression of the second order). Such an estimated model can be a good tool for inference, making it possible to calculate

- the target dividends to GDP ratio: $\tau = 0.0024/(1 - 0.9062) = 0.0256$, and
- speed of adjustment: $\alpha = 1 - 0.9062 = 0.0938$.

Calculated on the basis of the estimated model, the target dividends to GDP ratio is 2.6%—this is the value that countries should (tend to) achieve in the future, and it is by 71.8% more than in 2021 (1.49). Nonetheless, the speed of adjustment is very low, which means that it will take a long time to reach the target ratio.

Table 13. Results of the estimation of the panel partial adjustment model of dividends vs. GDP (486 observations). 2-step system GMM

Variables and statistics	Coefficient	*P*
Const	−0.6100	< 0.0001
DIV(-1)	0.9062	< 0.0001
GDP	0.0024	< 0.0001
Square of correlation coefficient between actual and fitted value of DIV	0.9861	
Test for AR(1) z statistic	−1.9970	0.0458
Test for AR(1) z statistic	−0.4580	0.6472
Sargan over-identification test: chi-square (76)	37.9021	0.9999
Wald (joint) test: chi-square(2)	6.2×10^7	< 0.0001

Source: Own calculations with GRETL.

Discussion of the results and conclusions

The dynamic growth of the nominal and real values of dividends paid in the world observed since the last quarter of the twentieth century is determined by the companies with the largest capitalization. The share of the 1,200 largest companies in the total value of dividends paid worldwide in 2021 exceeded 60%. In the second decade of the 21st century, the average annual nominal growth rate of dividends paid by U.S. companies which were among the 1,200 largest companies in the world was recorded at 6% and was higher than the growth rate of GDP. This means that companies are allocating more and more profits to shareholders. Kahle and Stulz (2021, 1360) found that in the 21st century the increase in aggregate corporate income accounts for 37% of the increase in aggregate annual payouts, and the increase in the payout ratio accounts for 63%.

However, the increase in global dividend payments was not the same in all countries and was subject to geographical, economic and legal regionalization. It has also been disturbed by economic fluctuations (especially the 2008 crisis) and, more recently, by the COVID pandemic.

The research on changes in payments by the 1,200 largest companies in the years 2009–2021 has led the author to the following observations:

1. Dividend payments in Australia and Asia grew the fastest.
2. COVID-19 significantly reduced dividend payments in 2020 in Europe and in Australia, although Australia already in 2021 noted the highest value of payments in the analyzed period and it completely compensated for the drop in payments associated with the 2020 pandemic.
3. Dividend payments in emerging markets countries grew faster than in developed markets countries, and COVID-19 did not significantly reduce payouts on emerging markets. Yet, developed markets still provide the vast majority of dividends and have an almost fourfold higher dividends to GDP ratio than emerging markets.
4. The common law system is more favorable to dividend payments. The dividends to GDP ratio in common law countries was more than twice as high as in civil law countries.
5. The world's largest companies still have a high potential for dividend growth. The estimated target dividends to GDP ratio is by 71.8% more than in 2021. At the same time, the speed of adjustment is very low, which means that it will take a long time to reach the target ratio.

However, the present research has some limitations since it concerns the policy of the largest 1,200 companies in the world, which currently pay about 60% of global dividends. By contrast, the growth in the rate of payments by smaller companies, especially in the developing markets of Asia (including primarily China), in the second decade of the twenty-first century was higher. Therefore, research into developing markets should be intensified.

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