Dividends in Europe

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Abstract

In Europe, we find that larger and more profitable companies are more likely to pay dividends. The relationship between investment opportunities and the probability of paying dividends is not constant over the analysis period. However, looking at the average for the period, payers have more investment opportunities than non-payers. Those who have never paid dividends have the best investment opportunities, and former payers stand out for their low profitability and investment opportunities. The proportion of companies paying dividends fell from 78% in 1992 to 39% in 2010. It rose again to 50% in 2018, with a decrease in the period of the COVID-19 pandemic, reaching only 37% of companies paying dividends in 2020. After 2020, there was a recovery in that percentage. The increase in the percentage of companies paying dividends in the recovery period (from 2011 to 2022) was attributed to 85.11% of changes in company characteristics and the remaining 14.89% to an increase in the propensity to pay dividends. However, dividing the recovery period into two subgroups, before and after the year of the pandemic (2020), the change in the propensity to pay dividends plays a more significant role than the change in company characteristics in increasing the percentage of companies that pay dividends after 2010.

Keywords: Dividends, determinants, change characteristics, propensity to pay.

Dividendos na Europa

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Resumo

Na Europa, as empresas maiores e mais rentáveis têm maiores probabilidades de pagar dividendos durante o período de estudo. A relação entre as oportunidades de investimento e a probabilidade de pagar dividendos não é constante ao longo do período, no entanto, olhando para a média do período, as empresas que pagam dividendos têm mais oportunidades de investimento do que as que não pagam. As empresas que nunca pagaram dividendos têm as melhores oportunidades de investimento e as antigas pagadoras de dividendos destacam-se pela baixa rendibilidade e oportunidades de investimento. A proporção de empresas que pagam dividendos caiu de 78% em 1992 para 39% em 2010 e voltou a subir para 50% em 2018, havendo um decréscimo no período da pandemia de COVID-19, onde apenas 37% das empresas pagam dividendos. Após 2020 registou-se uma recuperação dessa percentagem. O aumento da percentagem de empresas que pagam dividendos no período de recuperação (considerado de 2011 a 2022) deve-se a 85.11% a mudanças nas características das empresas e os restantes 14.89% deve-se a um aumento na propensão em pagar dividendos. No entanto, dividindo o período de recuperação em dois subgrupos, antes e depois do ano da pandemia (2020), a mudança na propensão em pagar dividendos tem um papel maior do que a mudança nas características da empresa no aumento da percentagem de empresas que pagam dividendos após 2010.

Palavras-chave: Dividendos, determinantes, mudança das características, propensão em pagar.

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1. Introduction

For many years, the subject of dividend payments has caused a great deal of intrigue among investors since it is the main remuneration for investors. Consequently, each company's dividend distribution policy is a topic of great interest to investors, as it is one of the leading financial decisions companies make in deciding whether to retain profits or distribute them to shareholders. Miller and Modigliani (1961) carried out one of the best-known studies at the international level, which has prompted further research into the impact of dividends on company value and the factors that influence companies' decisions to distribute dividends. As of today, there is still no consensus on the factors which matter the most to explain the decisions to distribute factors and there may even be more factors to be discovered.

Over time, there have been constant changes in the tendency of companies to pay dividends in different countries and continents, which can be derived from various factors. Fama and French (2001) documented a sharp decrease in companies paying dividends from 66.5% in 1978 to 20.8% in 1999 in companies listed on the NYSE, AMEX, and NASDAQ. In turn, Michaely and Moin (2022) documented a decrease from 73% in 1970 to 23% in 2000 and a recovery in the percentage of companies paying dividends to 36% in 2018.

Using Refinitiv Datastream, the behavior of companies paying dividends in Europe from 1992 to 2022 was studied. The percentage of companies paying dividends fell significantly from 78% in 1992 to 39% in 2010. After 2010, there was an increase until 2018, when around 51% of companies paid dividends. From 2018 to 2020, there was a decrease, reaching in 2020 the lowest percentage of companies that pay dividends, around 37%. After 2020, there was a recovery again. With this, three questions arose: (i) what are the determinants of the dividend distribution policy and the respective differences between companies that pay and do not pay dividends? (ii) whether the increase in companies paying dividends after 2010 is due to changes in company characteristics; (iii) and whether companies with typical characteristics of companies that pay dividends were more likely to pay dividends after 2010. This study provides answers to these three questions.

Firstly, using summary statistics and then logit regressions that confirmed what was studied by summary statistics, it was studied the differences between companies that pay dividends and those that do not pay in terms of three factors: profitability, size, and investment opportunities,

the same chosen by Fama and French (2001). Both methods suggest that larger and more profitable companies are more likely to pay dividends. Regarding investment opportunities, contrary to what has been documented by Fama and French (2001), using summary statistics, dividend payers have more investment opportunities than non-payers, and using logit regressions, no concrete conclusion was reached since the two variables used to measure investment opportunities present inverse relationships. In the analysis carried out using summary statistics, a more detailed analysis was made, decomposing the group of non-payers into former payers and companies that never paid dividends. Former payers are among the least profitable groups with fewer investment opportunities. One of the most essential points to note when making this division is that companies that have never paid dividends present more significant investment opportunities than any of the other groups under study, using any of the three ratios used to measure investment opportunities. In this subgroup, investment expenses exceed earnings. Finally, dividend payers are larger than any other group in the study.

After looking at the differences between dividend payers and non-payers, it was checked whether the increase in the percentage of companies paying dividends after 2010 was due to changes in the characteristics of the companies, whether it was because companies became more likely to pay dividends or whether it was due to both factors. Two methods, logistic regression and portfolio approach were used to quantify the effects of changes in characteristics and propensity to pay on the increase in the percentage of companies that pay dividends. The variation in the expected percentage of dividend payers reflects only the change in the companies' characteristics, and the variation in the difference between the expected percentage and the actual percentage of payers reflects the propensity to pay dividends. In both procedures, the expected percentage of payers increases, and the difference between the expected percentage and the actual percentage decreases, contributing both factors to the increase in the percentage of companies that pay dividends after 2010.

The study is broken down as follows: Section 2 reviews the literature on dividend distribution policy and the behavior of companies that pay dividends. Section 3 describes the sample data used in this study. Section 4 shows the behavior of companies in relation to the decision to pay dividends over time. Section 5 documents the differences in the characteristics of companies that pay dividends and those that do not. Section 6 shows some qualitative evidence of the decrease in dividend payers from 1992 to 2010 and the increase from 2010 to 2022. Section 7 quantifies the effects of changes in characteristics and propensity to pay dividends in the period of increase in the percentage of dividend payers. Section 8 shows which of the aspects, change

in characteristics or change in propensity to pay, had a greater impact on the increase in companies paying dividends after 2010. Section 9 concludes.

2. Literature Review

For many years, the discussion about dividend policy has been of interest to financial economists all over the world since dividend distribution policy is not only an essential component for most investors but it is also one of the most important financial decisions made by companies. Miller and Modigliani (1961) published one of the first articles on this subject.

The authors presented the "Theory of the Irrelevance of Dividends", suggesting that, in a perfect capital market, dividend policy has no impact on the total value of the company, arguing that the value of the company is dictated exclusively by the investments that companies make and the cash flows they generate. They also believed that paying dividends negatively affected the financial health of companies since the money was put to better use by being reinvested in the company.

This theory was a starting point for debates among economists about the relevance of this topic, generating a lot of controversy. Theories, contrary to the one proposed by Miller and Modigliani (1961) began to emerge, one of which was the "Bird-in-the-hand theory", developed by Lintner (1956, 1962) and Gordon (1959, 1962), which says that investors prefer dividends to capital gains because of the uncertainty that capital gains bring, contradicting Modigliani-Miller's "Theory of Dividend Irrelevance", which said that investors did not care where the returns came from. Walter (1956) was one of the authors who supported the relevance of dividends, proposing a model which states that, if a company has considerable investment opportunities, it will retain the money, if not, it will pay dividends.

Like the model proposed by Walter (1956), Gordon (1959) also concluded that a company's dividend policy is relevant and affects the company's value, showing that the intrinsic value of a stock today depends on its future dividends, taking into consideration certain assumptions. Years later, DeAngelo (2006), also refuted the theory proposed by Miller and Modigliani (1961), saying that it had no real-world applicability and showing that agency costs and fees made dividend policy relevant.

Later, several authors began to include more realistic assumptions to get around certain obstacles imposed previously, starting to consider, for example, tax effects, transaction costs, asymmetric information, and agency costs that impacted shareholder returns.

Thus, many authors started to propose theories that took these limitations into account, such as Easterbrook (1984), which proposed the “Theory of Agency Costs”, demonstrating that dividends can, in fact, help to decrease the problems associated with agency costs, and Bhattacharya (1979), who introduced the “Signalling Theory", which shows that dividends can be used to signal future cash flows in an imperfect capital market, mitigating the asymmetric information between shareholders and managers. Another theory that plays an important role in dividend policy is the "Catering Theory of Dividends", proposed by Baker and Wurgler (2004), which explains that the decision for companies to pay dividends is related to the fact that investors look for companies that pay dividends.

After the publication of these first studies on dividends, authors began to study the characteristics of companies that influence the decision to pay dividends. Concerning profitability, many of the authors who have studied the relationship between the two variables (e.g., Fama and French (2001), Aivazian, Booth, and Cleary (2003), Al-Malkawi (2007), Dennis and Osobov (2008), Al-Kuwari (2009)) have found that more profitable companies are more likely to pay dividends. However, some authors have found the opposite, such as Bogna Kaźmierska-Jóźwiak (2015), who says that companies prefer to use retained earnings as the primary funding source and are therefore less likely to pay dividends. Regarding investment opportunities, some authors have concluded that investment opportunities and dividend policy are negatively related (e.g., Fama and French (2001), Mitton (2004), Guttman et al. (2010)) and that companies with high investment opportunities are less likely to pay dividends to conserve the resources needed to finance growth opportunities (Abor and Bopkin (2010), Baker et al. (2012)). However, some authors have also found that the relationship between investment opportunities and the probability of paying dividends is not homogeneous (Dennis and Osobov (2008)). Finally, regard to company size, most authors have found that the larger the companies, the more likely they are to pay dividends (Ho (2003), Aivazian, Booth, and Cleary (2003), Al-Malkawi (2007), Bogna Kaźmierska-Jóźwiak (2015)).

At the beginning of the 21st century, Fama and French (2001) started discussing what was happening to the propensity to pay dividends. The authors showed that the number of companies that pay dividends, listed on the three major stock exchanges in the United States,

fell from 66.5% in 1978 to 20.8% in 1999, mainly due to the increase in listed companies with the characteristics of companies that do not pay dividends (low profits, large investments in relation to profits, small size).

After the publication of this article, economists wanted to start studying this phenomenon. Ferris, Sen, and Yui (2006) wanted to see if this decrease in the propensity to pay dividends applied only to the US or extended to other countries. They, therefore, carried out the same study as Fama and French (2001), but for the United Kingdom, and came to two conclusions: the number of companies paying dividends has decreased, but not by as large a percentage as in the US, and the decrease in the propensity to pay dividends is also not as marked as in the US.

This decrease was also documented by Denis and Osobov (2006) in a study carried out in six developed countries (United States, United Kingdom, Canada, France, Germany, and Japan) and by Ali Fatemi and Recep Bildi (2012), who also found a substantial variation in the propensity to pay dividends, but at a more international level using 33 countries for the study. No one had yet studied the magnitude of this drop in the propensity to pay dividends documented by Fama and French. Hence, Salas and Chahyadi (2006) used an innovative technique to measure that, concluding that there is a decrease in the propensity to pay dividends. However, it is less significant than the ones suggested by other papers when controlling for the characteristics of company size, profitability, company age, and growth opportunities. Recently, Lai, Wang, Du, and Pi (2021) studied the propensity to pay dividends in the US banking sector. They also documented a decline in the propensity to pay dividends, and they found that non-financial firms are less likely to pay dividends than banks.

On the other hand, DeAngelo, DeAngelo, and Skinner (2004) documented that although there were fewer dividend-paying companies in 2000 than in 1978, there was an increase in aggregate real dividends and dividend concentration due to the increase in profits of the largest dividend-paying companies. The authors also say that the decrease in dividend-paying companies between 1978 and 2000 is because many companies suffered from financial difficulties and were delisted because they were acquired. In line with this, Julio and Ikenberry (2004) did find a decrease in the propensity to pay dividends from 1984 to 2000. However, they also documented a small but significant increase in the number of companies paying dividends from 2001 onwards, suggesting the reappearance of dividends. However, it is unclear whether this reappearance is temporary or permanent, given that the study period is up to 2002.

In more recent studies, Floyd, Li, and Skinner (2015) compared the payout policies between US industrials and banks. They reported a decrease in the fraction of industrials that pay dividends from 57% in 1980 to 15% in 2002, but after 2002, they documented a slight increase in the number of companies that pay dividends from 15% in 2002 to 28% in 2012. The authors also found that banks are more likely to pay dividends than industrials.

Lastly, Michaely and Moin (2022) reported a decrease in US companies paying dividends from 73% in 1978 to 23% in 2000 and then an increase to 36% in 2018, explaining that a large part of the disappearance of dividends was due to changes in company characteristics and the proclivity to pay, which the authors define as the probability of paying dividends conditioned by characteristics.

3. Data description

Although Europe has 48 countries according to Refinitiv Eikon, information from 40 countries was collected through Refinitiv Datastream using the Worldscope codes since there was no information for the five microstates of Europe (Andorra, Monaco, Liechtenstein, San Marino, Holy See), and for three countries (Belarus, Moldova, and Albania). The sample contains companies from the 40 countries in Europe between 1992 and 2022 that present information on assets, market value, net income after preferred dividends, net income before extra items, interest expense, liabilities, dividends per share, preferred stock, and if available, on research and development, deferred taxes and investment tax credit and deferred taxes. There had to be information on current and previous year assets; for the other items, it had to be available in year *t*. The chosen time interval is because, according to Dennis and Osobov (2008), Worldscope coverage before 1985 is limited, and, in addition, before 1990, there were few companies in the countries that met the requirements. Therefore, to mitigate this problem and have a considerable number of companies in the study, it was studied the behavior of dividends over the last 30 decades, from 1992 to 2022. Utilities and financial firms were excluded, as was done in previous literature because the decision to pay dividends can be a consequence of strict regulation that differs from other industries. Companies with negative book equity were also excluded, leaving 12,486 companies in the sample. As can be seen in Table 2, the companies were divided into two groups: those paying dividends in year *t* and those not paying dividends. Within the companies that do not pay dividends, two subgroups were created: companies that never paid dividends in the years they existed and former payers (which did not pay dividends in year *t* and paid in *t*-1). This division was made to analyze in more detail the behavior of the

groups over the years and to analyze more concretely the differences between the groups using summary statistics.

To see the differences between companies that pay dividends and those that do not in terms of company characteristics, several variables were considered. Profitability (E*t*/A*t*) was measured as the ratio of earnings before interest to total book assets and as the ratio of earnings available for common to book equity (Y*t*/BE*t*). Investment opportunities were measured in three ways: the ratio between the firm's market value and total book assets (Vt/At), the growth rate of total book assets (dA*t*/A*t*), and R&D expenditures to total book assets (RD*t*/A*t*). The size variable was initially measured as total book assets (A*t*). However, for the logit regressions and portfolio approach, the logarithm of total assets was used as the measure for company size since we are dealing with companies of various sizes, and using this measure makes the sample more uniform and allows for easier comparability of the size of the companies. The values extracted have all been converted into euros. Table 1 provides descriptive statistics for the variables used for the logit regressions. As the distribution of some variables was highly skewed, all variables were winsorized at the 10% level.

Table 1: Descriptive Statistics for the variables used for the logit regressions

	Size	Et/At	Vt/At	dAt/At
Count	131898	131898	131898	131898
Mean	11,791	0,029	1,451	0,052
Std Dev	2,205	0,089	0,691	0,156
Min	2,398	-0,157	0,737	-0,203
25%	10,292	-0,009	0,931	-0,051
50%	11,635	0,047	1,205	0,044
75%	13,167	0,092	1,771	0,154
Max	20,680	0,141	2,935	0,324

4. Dividend behavior over time

This section will analyze the behavior of dividends in Europe over the chosen period from 1992 to 2022. Figure 1 shows the number of non-financial and non-utility companies that pay dividends, that do not pay dividends, that have never paid dividends, and the former dividend payers, and Figure 2 shows the percentage of companies in the four different groups in the

sample. To complete this analysis, Table 2 shows the numbers and percentages of companies in the different groups.

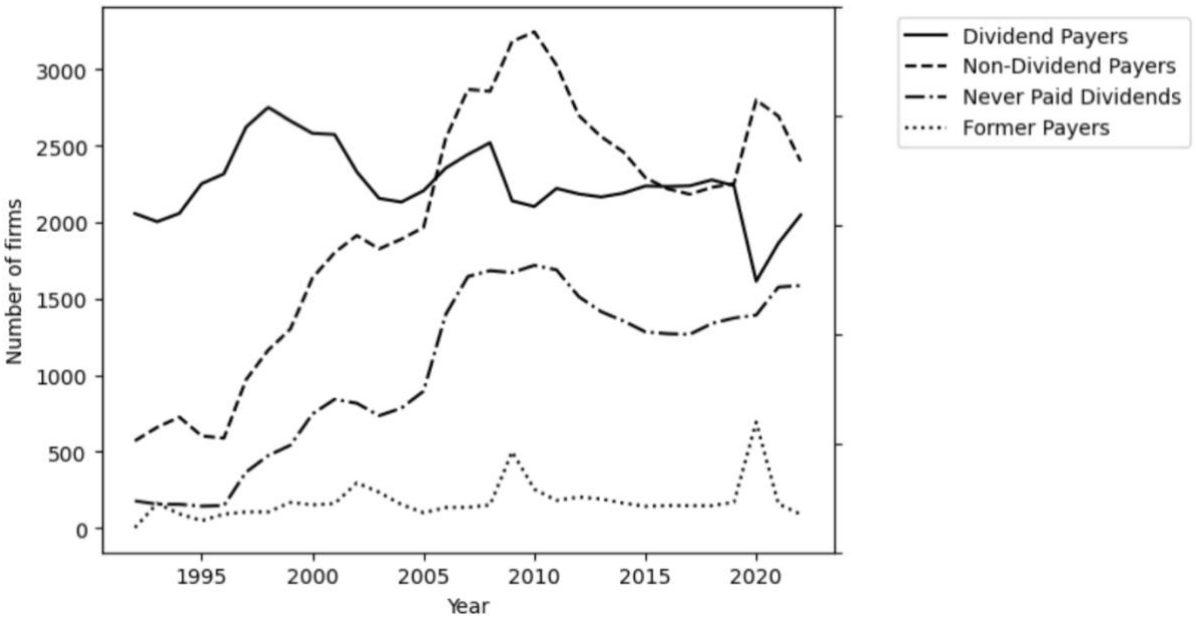

Figure 1: Number of European companies in the sample in the four groups.

Payers pay dividends in year *t*; non-payers do not. The two subgroups of non-payers are companies that never pay dividends and former payers (companies that do not pay dividends in year *t* but did in year *t*-1).

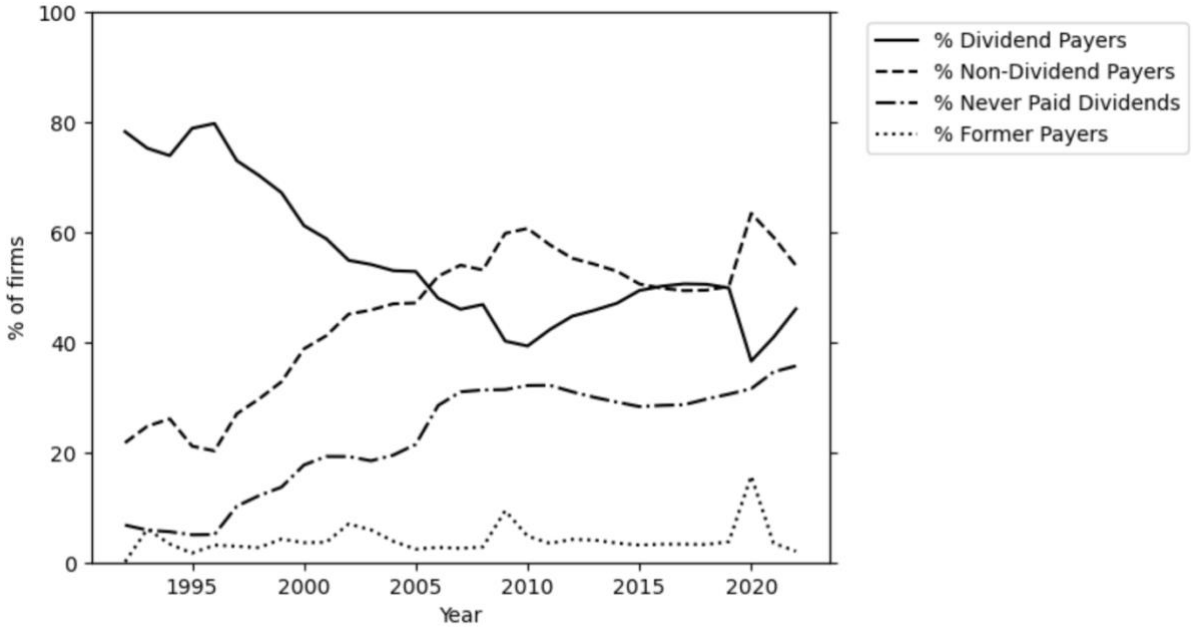

Figure 2: Percentage of European companies in the sample in the four groups.

Payers pay dividends in year *t*; non-payers do not. The two subgroups of non-payers are companies that never pay dividends and former payers (companies that do not pay dividends in year *t* but did in year *t*-1).

Table 2: Summary Statistics

Annual number (and percentages) of dividend payers, non-payers, never-payers, and former payers of Europe from 1992 to 2022. Payers pay dividends in year *t*; non-payers do not. The two subgroups of non-payers are firms that have never paid dividends and former payers (companies that do not pay dividends in year *t* but did in year *t*-1).

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
All firms	2628	2663	2784	2855	2904	3592	3914	3963	4217	4375	4243	3982	4022	4173	4904
Payers	2057	2004	2058	2252	2316	2622	2751	2662	2581	2573	2329	2156	2132	2206	2354
% Payers	78	75	74	79	80	73	70	67	61	59	55	54	53	53	48
Non-payers	571	659	726	603	588	970	1163	1301	1636	1802	1914	1826	1890	1967	2550
% Non-payers	22	25	26	21	20	27	30	33	39	41	45	46	47	47	52
Never payers	178	156	155	143	147	367	475	542	746	842	816	735	784	895	1398
% Never payers	7	6	6	5	5	10	12	14	18	19	19	18	19	21	29
Former Payers	2	161	93	48	91	105	105	168	151	160	296	235	154	100	134
% Former payer	0	6	3	2	3	3	3	4	4	4	7	6	4	2	3

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
All firms	5312	5375	5323	5349	5249	4883	4724	4650	4528	4452	4421	4505	4491	4415	4556	4446
Payers	2443	2519	2140	2103	2221	2185	2165	2190	2237	2234	2238	2277	2239	1615	1864	2048
% Payers	46	47	40	39	42	45	46	47	49	50	51	51	50	37	41	46
Non-payers	2869	2856	3183	3246	3028	2698	2559	2460	2291	2218	2183	2228	2252	2800	2692	2398
% Non-payers	54	53	60	61	58	55	54	53	51	50	49	49	50	63	59	54
Never payers	1646	1684	1671	1719	1689	1513	1416	1354	1282	1270	1266	1337	1373	1393	1577	1587
% Never payers	31	31	31	32	32	31	30	29	28	29	29	30	31	32	35	36
Former Payers	135	151	500	255	181	204	191	163	142	147	146	146	169	693	158	90
% Former payer	3	3	9	5	3	4	4	4	3	3	3	3	4	16	3	2

It can be seen from the results in Table 2 that the percentage of companies paying dividends fell sharply from 78% in 1992 to 46% in 2022. Between 1996 and 2010, the percentage of companies paying dividends fell steadily, but after 2010, when 39% of companies paid dividends, the percentage rose slightly to 51% in 2018. The year of COVID-19 pandemic (2020) was marked by the sharpest drop in the percentage of companies paying dividends during the period covered by the study, with a 13 percentage points drop compared to 2019 and the lowest number of companies paying dividends, around 1,615.

On the other hand, the number of companies that do not pay dividends increased from 571 (22%) in 1992 to 2398 (54%) in 2022. The number of companies that have never paid dividends reached 1,587 at the end of 2022 compared to 178 in 1992, reaching an all-time high of 1,689 in 2011. It is worth noting that the total number of companies that do not pay dividends and have never paid dividends has grown by approximately a factor of 4 and 9, respectively, compared to the initial value in 1992. On the other hand, the relatively low number and percentage of former dividend payers during the chosen period suggest that the companies that pay dividends, in general, are always the same companies that continue with their practice over time.

From a graphical point of view, it is possible to see that over time, dividend-paying companies have been decreasing while non-dividend-paying companies have been increasing. In two-time intervals, 2006-2014 and 2020-2022, the number and percentage of non-dividend-paying companies is higher than that of dividend-paying companies. However, since 2010, the scenario has been reversing, with companies that pay dividends increasing and companies that do not pay dividends decreasing.

5. Firms' Characteristics

With the increase in dividend-paying companies since 2010, some questions arise: (i) What characteristics distinguish dividend-paying companies from non-dividend-paying companies? (ii) is the increase in the percentage of dividend-paying companies due to the increase in companies with dividend-paying characteristics, or (iii) is it because companies with typical dividend-paying characteristics have become more likely to pay dividends? In this section, we will look at the differences between companies that pay dividends and those that do not, using summary statistics regarding profitability, investment opportunities, and firm size.

Table 3: Average firm size and ratios of aggregate earnings, investment, firm's market value to aggregate assets, and book equity for the different dividend groups.

A_t, BE_t, ME_t, V_t are the assets, book equity, the market value of equity, and the market value of the firm at the end of the year t. E_t, Y_t, and RD_t are earnings before interest but after tax, earnings available for common shareholders, and R&D expenditures for year t. The investment, dAt, is $A_t - A_{t-1}$. The ratios shown are ratios of the aggregate year t values of the variables for the companies in a group. Results are shown for all firms and for firms in the four different groups. For each variable, the average for 1992-2022 for each group of companies is shown at the end.

Et/At (percent)

	All firms	Payers	Non-payers	Never payers	Former payers
1992	5,97	6,36	2,34	0,97	-3,35
1993	5,62	6,01	2,48	0,85	0,86
1994	6,26	6,60	4,21	1,79	3,62
1995	6,48	6,68	4,44	0,21	4,80
1996	6,51	7,04	2,30	-0,09	-0,66
1997	6,88	7,22	3,44	0,84	1,94
1998	6,85	7,23	3,14	0,07	3,26
1999	6,48	6,82	3,27	-0,21	0,99
2000	6,92	7,56	1,46	-4,64	-3,03
2001	4,10	4,72	-0,80	-11,38	-6,43
2002	3,02	4,26	-4,51	-13,09	-2,53
2003	4,90	6,04	-0,47	-8,47	1,94
2004	6,73	7,21	4,12	-1,18	1,85
2005	7,86	8,27	4,46	2,32	2,92
2006	8,61	8,99	4,98	2,28	1,58
2007	9,62	9,97	5,74	4,46	2,90
2008	7,56	8,22	-0,72	-0,81	-1,93
2009	5,92	6,68	1,72	-0,16	1,80
2010	7,60	8,36	3,96	2,94	2,29
2011	7,70	8,25	3,07	0,93	5,06
2012	7,00	7,61	1,63	3,07	-0,01
2013	6,48	7,19	0,89	3,70	-1,61
2014	5,18	5,68	1,31	1,92	0,38
2015	4,23	4,57	1,66	2,67	-0,43
2016	4,49	4,76	2,36	3,60	2,47
2017	5,72	5,96	3,47	2,60	2,37
2018	5,73	5,95	3,14	1,39	6,47
2019	5,04	5,21	2,84	2,79	0,81
2020	2,43	3,17	-0,36	-0,11	-0,80
2021	6,41	7,19	2,65	1,93	1,47
2022	6,55	7,25	1,59	0,89	-1,50
MEAN	6,16	6,68	2,25	0,07	0,89

Yt/At (percent)

	All firms	Payers	Non-payers	Never payers	Former payers
1992	9,13	10,47	-9,36	-18,58	-171,83
1993	8,75	10,01	-4,88	-19,61	-11,27
1994	11,68	12,64	4,17	-8,41	3,41
1995	12,39	13,06	3,89	-19,48	5,49
1996	12,75	13,93	-0,32	-15,26	-9,27
1997	14,34	15,20	3,86	-9,17	1,24
1998	14,16	15,23	2,91	-7,52	1,17
1999	13,38	14,45	3,29	-8,18	-1,20
2000	13,67	15,52	-0,21	-13,56	-9,00
2001	6,06	7,95	-6,82	-31,52	-30,04
2002	3,36	7,01	-16,25	-36,35	-17,27
2003	9,12	12,67	-7,69	-25,68	-3,04
2004	13,99	15,57	5,35	-8,77	-0,15
2005	17,39	18,56	7,59	1,58	4,06
2006	19,87	20,88	9,94	0,91	6,22
2007	22,19	23,31	10,43	5,30	3,45
2008	16,78	18,70	-7,47	-7,09	-12,93
2009	12,06	14,13	0,22	-6,03	1,04
2010	16,64	18,31	6,83	2,75	4,65
2011	16,48	17,88	4,10	1,34	8,01
2012	14,30	15,71	-0,49	2,45	-5,54
2013	13,09	14,62	-3,63	3,43	-14,85
2014	12,32	13,74	-1,81	-0,18	-3,35
2015	8,70	9,72	-0,86	1,44	-5,22
2016	9,48	10,39	1,64	3,02	2,65
2017	13,50	14,30	5,32	1,22	3,48
2018	13,35	14,11	3,94	-1,30	12,02
2019	11,49	12,15	3,45	2,74	1,07
2020	4,43	6,67	-4,36	-4,19	-5,60
2021	15,73	17,70	4,94	1,49	1,54
2022	15,29	17,12	0,59	-1,10	-10,83
MEAN	12,77	14,25	0,59	-6,91	-8,13

dAt/At (percent)

	All firms	Payers	Non-payers	Never payers	Former payers
1992	4,84	5,03	3,07	5,16	13,57
1993	3,95	5,07	-4,99	8,49	-11,86
1994	5,13	5,27	4,26	3,64	5,32
1995	3,89	4,11	1,65	0,83	-1,66
1996	5,89	6,27	2,90	4,75	5,52
1997	12,09	12,62	6,76	13,57	-1,39
1998	4,31	4,43	3,20	14,30	15,84
1999	17,54	16,20	30,32	24,58	64,09
2000	23,70	23,15	28,39	39,45	6,53
2001	5,44	5,66	3,71	2,49	-16,36
2002	-6,05	-5,10	-11,86	-14,47	-13,64
2003	-4,51	-2,31	-14,88	-12,90	-18,12
2004	3,08	4,04	-2,20	1,26	-7,68
2005	12,52	12,39	13,61	19,40	4,51
2006	9,92	9,72	11,78	18,60	20,17
2007	8,45	7,98	13,70	22,84	7,59
2008	7,67	7,84	5,51	11,80	-1,52
2009	-4,62	-3,54	-10,56	-9,12	-11,39
2010	8,70	8,91	7,69	13,52	5,01
2011	6,46	6,60	5,26	8,62	10,95
2012	6,18	6,44	3,86	9,73	2,07
2013	0,87	1,28	-2,34	0,80	-4,38
2014	9,79	9,91	8,83	32,04	-7,51
2015	2,99	3,06	2,48	12,84	-3,31
2016	5,00	5,89	-1,99	5,73	-6,56
2017	3,54	3,71	1,92	3,34	-4,58
2018	6,46	6,56	5,25	9,32	4,27
2019	5,96	5,76	8,43	13,79	0,31
2020	-0,92	-1,09	-0,26	10,27	-2,06
2021	9,89	9,23	13,09	29,10	3,45
2022	7,47	7,57	6,71	7,70	7,34
MEAN	5,99	6,21	4,62	10,05	2,08

Table 3 (continued)

Vt/At

	All firms	Payers	Non-payers	Never payers	Former payers
1992	1,06	1,06	1,05	1,05	1,12
1993	1,19	1,20	1,07	1,14	0,95
1994	1,18	1,20	1,09	1,25	1,00
1995	1,22	1,23	1,16	1,33	0,94
1996	1,29	1,30	1,17	1,34	1,08
1997	1,48	1,49	1,37	1,60	1,11
1998	1,40	1,42	1,27	1,52	1,26
1999	1,58	1,59	1,48	1,95	0,93
2000	1,61	1,58	1,87	2,45	1,27
2001	1,26	1,28	1,12	1,28	0,91
2002	1,18	1,21	1,00	1,02	1,03
2003	1,28	1,30	1,19	1,36	1,10
2004	1,37	1,39	1,25	1,57	1,12
2005	1,42	1,43	1,36	1,90	1,36
2006	1,48	1,47	1,57	1,93	1,29
2007	1,55	1,54	1,60	1,83	1,38
2008	1,17	1,16	1,20	1,30	1,20
2009	1,22	1,24	1,15	1,36	1,07
2010	1,25	1,26	1,18	1,60	1,08
2011	1,15	1,16	1,08	1,29	0,99
2012	1,22	1,23	1,07	1,29	0,93
2013	1,29	1,31	1,16	1,38	1,13
2014	1,29	1,29	1,30	1,88	1,08
2015	1,36	1,36	1,30	1,90	0,97
2016	1,32	1,34	1,21	1,74	1,00
2017	1,38	1,38	1,37	1,91	1,23
2018	1,34	1,33	1,47	2,05	1,10
2019	1,32	1,31	1,45	1,85	0,99
2020	1,36	1,34	1,41	2,57	1,21
2021	1,44	1,45	1,41	2,08	1,25
2022	1,29	1,30	1,19	1,45	1,09
MEAN	1,32	1,33	1,28	1,62	1,10

RDt/At

	All firms	Payers	Non-payers	Never payers	Former payers
1992	0,019	0,019	0,015	0,004	0,000
1993	0,019	0,020	0,015	0,006	0,005
1994	0,019	0,019	0,014	0,007	0,024
1995	0,019	0,020	0,012	0,007	0,015
1996	0,018	0,018	0,020	0,017	0,029
1997	0,019	0,019	0,017	0,015	0,029
1998	0,019	0,019	0,014	0,016	0,005
1999	0,018	0,018	0,010	0,011	0,004
2000	0,016	0,017	0,014	0,014	0,004
2001	0,017	0,017	0,012	0,022	0,006
2002	0,017	0,017	0,016	0,028	0,030
2003	0,017	0,017	0,016	0,027	0,016
2004	0,018	0,018	0,019	0,036	0,018
2005	0,015	0,015	0,016	0,023	0,005
2006	0,015	0,015	0,014	0,016	0,014
2007	0,014	0,014	0,012	0,013	0,005
2008	0,013	0,013	0,015	0,012	0,031
2009	0,014	0,014	0,012	0,013	0,009
2010	0,013	0,013	0,015	0,010	0,022
2011	0,013	0,013	0,011	0,010	0,005
2012	0,013	0,013	0,013	0,011	0,017
2013	0,013	0,013	0,014	0,013	0,011
2014	0,014	0,014	0,013	0,017	0,006
2015	0,015	0,015	0,012	0,013	0,001
2016	0,013	0,014	0,010	0,016	0,003
2017	0,012	0,012	0,011	0,018	0,005
2018	0,012	0,012	0,012	0,018	0,003
2019	0,013	0,013	0,013	0,019	0,007
2020	0,012	0,013	0,011	0,018	0,010
2021	0,012	0,012	0,013	0,017	0,021
2022	0,013	0,014	0,011	0,018	0,011
MEAN	0,015	0,015	0,014	0,016	0,012

At

	All firms	Payers	Non-payers	Never payers	Former payers
1992	900693	1039981	398914	249235	171627
1993	935423	1103923	423021	284400	476966
1994	968622	1124608	526447	286119	1373241
1995	993459	1143816	431927	250064	1060581
1996	1051413	1172531	574358	296102	1282797
1997	995887	1240121	335700	157229	635082
1998	946004	1221653	293975	140161	687674
1999	1217695	1640219	353160	199049	679344
2000	1473392	2155480	397310	206474	216425
2001	1520330	2293686	416087	156481	710708
2002	1443123	2257929	451647	116263	853844
2003	1450451	2210058	553566	107053	1554924
2004	1472964	2349587	484095	107299	561265
2005	1639752	2767151	375368	98300	631982
2006	1567919	2952373	289877	105079	593448
2007	1566644	3123469	240983	119235	388865
2008	1668473	3297392	231762	131524	758910
2009	1574497	3315817	403770	120385	1492660
2010	1724580	3634305	487318	138512	1573209
2011	1892252	3996962	348473	139347	457046
2012	2147935	4308320	398327	157449	1587893
2013	2207360	4267610	464320	164865	1378497
2014	2482885	4675202	531189	234289	1318129
2015	2632085	4698019	614845	273963	1719792
2016	2777471	4913317	626217	244163	1848295
2017	2905512	5200019	553195	253840	1048407
2018	3009506	5499032	465228	265243	830640
2019	3205792	5951839	475597	288700	858371
2020	3189240	6882924	1058776	295250	2868372
2021	3384414	6855485	980968	359881	2270818
2022	3545430	6744585	813208	477392	1433468
MEAN	1886813	3356046	483859	207205	1074945

5.1 Profitability

Table 3 analyzes the characteristics of the companies in the sample from 1992 to 2022 for four groups of companies. It can be seen that companies that pay dividends have higher profitability than those that do not pay dividends throughout the sample period, which is consistent with Fama and French (2001) and other literature. For the period from 1992 to 2022, it can be seen in Table 3 that the E_t/A_t ratio (ratio of aggregate earnings before interests to aggregate total assets) shows an average of 6.68% for companies that pay dividends and around 2.25% for companies that do not pay dividends. Among the companies that do not pay dividends, the companies that have never paid dividends have the lowest average profitability over the period, around 0.07%, followed by former payers (0.89%) and non-payers (2.25%).

Another ratio that measures profitability is Y_t/A_t (ratio of aggregate earnings available for common to aggregate book equity), which represents the profit that can be distributed as dividends to common shareholders. Using this ratio, it is possible to see an even more significant difference between companies that pay dividends and those that do not. Dividend-paying companies have an average of 14.25% over 1992-2022 versus 0.59% for non-dividend-paying companies. The two subgroups of companies that do not pay dividends have a negative average for the period under study, with -6.91% for those that have never paid dividends and -8.13% for former payers.

5.2 Investments Opportunities

According to Table 3, over the period from 1992 to 2022, the companies that never pay dividends are the ones with the best investment opportunities. This subgroup has the highest average for asset growth (dA_t/A_t), around 10.05%, compared to the companies that pay dividends (6.21%) and the former payers (2.08%). Regarding the V_t/A_t ratio (the ratio of the aggregate market value to the aggregate book value of assets), the companies that never pay dividends also have a higher ratio (1.62%) than companies that pay dividends (1.33%) and former payers (1.10%). In terms of the ratio of aggregate research and development to total book assets ($R\&D_t/A_t$), the values are similar because few companies present values under research and development expenditures since European companies are not obliged to make their values public. However, the companies that have never paid dividends still have the highest

average for the period, about 0.016, and, in contrast, the companies that pay dividends have 0.015 and the former payers 0.012.

It is also important to note that although the sub-group of companies that never pay dividends has higher values in all three ratios used for investment opportunities, the general group of non-payers has a lower value in all three ratios than companies that pay dividends. This can be because the broad group of non-payers includes, in addition to companies that have never paid dividends, former payers and companies that did not pay in *t* and *t*-1 but did pay in other years, and these two sets of companies are mostly mature companies with fewer investment opportunities, which end up reducing the value of the ratios used to measure investment opportunities in the general group of "non-dividend payers". It is also important to highlight that there is no consistency in values over the years, with payers having more significant investment opportunities than non-payers and years in which they do not. In fact, this inconsistency between investment opportunities and the decision to pay dividends is also noted in the study made by Dennis and Osobov (2008), who also failed to infer anything specific about the relationship between investment opportunities and the decision to pay dividends in the countries that the authors studied, since they concluded that there were countries in which dividend payers had better investment opportunities and countries in which payers had fewer investment opportunities. Also, in the study by Fama and French (2001), in some sub-periods, although not the majority, payers had greater investment opportunities than non-payers.

Reiterating, companies that have never paid dividends are highlighted as having better investment opportunities in average than any of the groups under study despite being among those with the lowest profitability.

5.3 Size

Concerning company size (A_t), it can be seen that dividend-paying companies are much larger than non-dividend-paying companies in any year of the study period, being almost seven times larger than the average assets of non-payers for the period 1992-2022 (Table 3). Among the companies that do not pay dividends, the former payers are around five times higher than those that have never paid dividends. Although the percentage of dividend-paying companies decreased from 1992 to 2010 and increased from 2010 to 2018, dividend-paying companies have become increasingly larger than non-dividend-payers.

Table 4: Percent of aggregate values accounted for by firms paying dividends.

A_t, BE_t, ME_t, V_t are the assets, book equity, the market value of equity, and the firm's market value at the end of the year t. E_t, Y_t, and RD_t are earnings before interest but after tax, earnings available for common shareholders, and R&D expenditures for year t. The investment, dA_t, is $A_t - A_{t-1}$. The table shows the percentages of the aggregate values of the variables represented in each sample year by the companies that pay dividends.

	Et	At	Yt	dAt	Vt	R&Dt	BEt	MEt
1992	96,23	90,38	106,97	93,89	90,48	92,05	93,20	93,07
1993	95,05	88,81	104,74	114,15	89,86	91,37	91,51	92,92
1994	90,47	85,83	95,96	88,22	86,96	89,19	88,67	90,21
1995	93,71	90,82	97,70	96,11	91,28	94,38	92,67	92,93
1996	96,09	88,94	100,21	94,56	89,92	88,03	91,73	92,44
1997	95,45	90,90	97,96	94,91	91,58	91,48	92,44	92,75
1998	95,76	90,77	98,21	93,16	91,64	93,07	91,32	92,64
1999	95,20	90,48	97,63	83,55	91,09	94,40	90,39	91,47
2000	97,80	89,54	100,18	87,46	87,85	91,39	88,25	86,32
2001	102,21	88,73	114,43	92,31	90,06	91,90	87,18	90,42
2002	121,11	85,88	175,68	72,34	88,03	86,48	84,33	89,41
2003	101,66	82,50	114,70	42,28	83,73	83,79	82,56	84,93
2004	90,56	84,56	94,10	111,04	85,89	83,63	84,58	87,00
2005	93,87	89,21	95,34	88,28	89,71	88,61	89,31	90,13
2006	94,44	90,39	95,36	88,58	89,82	90,52	90,73	89,58
2007	95,04	91,69	95,91	86,53	91,40	92,77	91,30	91,05
2008	100,70	92,62	103,26	94,69	92,39	91,46	92,67	92,16
2009	95,54	84,67	99,72	64,92	85,56	86,89	85,07	86,72
2010	91,06	82,85	94,02	84,84	83,80	79,98	85,43	86,26
2011	95,76	89,38	97,46	91,35	90,05	91,24	89,81	91,07
2012	97,61	89,75	100,30	93,59	90,96	89,84	91,27	93,09
2013	98,43	88,61	102,34	130,63	89,76	87,66	91,58	92,47
2014	97,15	88,68	101,33	89,79	88,62	89,48	90,90	89,82
2015	95,36	88,18	100,95	90,18	88,67	90,56	90,39	90,22
2016	94,10	88,77	98,19	104,47	89,74	91,25	89,56	91,05
2017	94,31	90,60	96,49	94,90	90,71	91,56	91,09	91,05
2018	95,81	92,35	97,82	93,79	91,61	92,68	92,60	91,10
2019	95,80	92,56	97,71	89,48	91,84	92,22	92,36	91,08
2020	103,08	78,95	119,96	94,10	78,14	81,85	79,70	77,77
2021	92,93	82,87	95,15	77,34	83,25	82,02	84,56	84,30
2022	96,99	87,63	99,57	88,89	88,50	90,17	88,93	90,06

Table 4 gives a different perspective on the size of companies between dividend-paying and non-dividend-paying companies, showing the percentage of the aggregate values of each measure represented by dividend-paying companies. For example, in 2021 and 2022, when less than half of companies paid dividends (41% and 46%, respectively), dividend-paying companies accounted for around 82.87%-87.63% and 84.30%-90.06% of the aggregate book value of assets and market value of common equity. Companies that pay dividends are more

profitable than companies that do not pay dividends. Therefore, as Table 4 shows, they represent a large percentage of companies in aggregate earnings. In the most recent years, 2021 and 2022, companies that pay dividends account for around 92.93%-96.99% and 95.15%-99.57% of the aggregate value of earnings. In some years, the percentage of companies in the aggregate earnings is greater than 100% because there are companies in the sample that show negative earnings in some years (mostly companies that do not pay dividends), which means that the numerator (aggregate values of the used measure of dividend-paying companies) is greater than the denominator (aggregate values of the measure used from all the companies in the sample) in each year.

5.4 Synopsis

In summary, it has been concluded that the three factors - profitability, investment opportunities, and firm size - are essential in a company's decision to pay dividends. Companies that pay dividends are the most profitable and the largest. Companies that never pay dividends, although they are the least profitable and the smallest, are the ones with the best investment opportunities (highest dA_t/A_t, V_t/A_t, and $R\&D_t/A_t$), and their investment spending, on average over the period 1992-2022, is much higher than their earnings. Companies that are part of the former payers group are the ones that are less profitable and have the fewest investment opportunities since they are mainly mature companies that have already paid dividends. In the year they do not pay dividends, they may have suffered difficulties that affected their profitability and, consequently, their decision not to pay dividends that year. They also have poor investment opportunities because they are mainly mature and have already passed the growth phase.

5.5 Logit regressions

Table 5 presents the logit regression for the period and the logit regressions for each year, more adequately documenting the effects of the three chosen factors (company size, investment opportunities, and profitability) on the probability of companies paying dividends.

Company size (A_t) was measured as the logarithm of total book assets, investment opportunities were calculated as the ratio between the company's market value and total book assets (V_t/A_t) and as the asset growth rate (dA_t/A_t) and, finally, profitability (E_t/A_t) was measured as the ratio between earnings before interest and total book assets. In line with what was done by Fama and

French (2001) and Fama and Macbeth (1973), for the period 1992-2022, the time-series standard deviations of the annual coefficients were used to make inferences about the average of the yearly coefficients.

Table 5: Logit regressions to explain which firms pay dividends.

A logit regression was estimated for each year of the sample, and one was also calculated for the entire period from 1992 to 2022. The dependent variable takes the value of 1 in year t if a firm pays dividends and 0 otherwise. The independent variables are profitability (E_t/A_t), size (logarithm of total book assets), the market-to-book ratio (V_t/A_t), and the growth rate of assets (dA_t/A_t). The table shows the regression intercepts (const) and slopes for the coefficients and shows the t-statistics, defined by the coefficients divided by their standard error. For the 1992-2022 regression, the intercepts (const) and slopes of the annual regressions were averaged, and the t-statistics were defined as the average of the yearly coefficients divided by its standard error (the standard deviation of the period divided by the square root of the number of years in the period).

	Coefficients					t-statistics				
	const	Et/At	size	Vt/At	dAt/At	const	Et/At	size	Vt/At	dAt/At
1992-2022	-5,059	11,675	0,400	0,169	-1,113	-20,046	42,721	29,631	3,244	-5,575
1992	-3,100	12,526	0,303	0,250	-0,694	-7,479	14,448	9,493	2,016	-1,912
1993	-2,790	11,777	0,255	0,262	1,705	-7,158	14,187	8,626	2,433	4,586
1994	-2,703	9,215	0,240	0,265	0,696	-7,294	11,509	8,665	2,869	1,920
1995	-2,344	8,987	0,247	0,163	0,799	-6,024	11,420	8,238	1,769	2,030
1996	-1,867	10,483	0,230	-0,045	0,508	-4,746	13,343	7,547	-0,528	1,324
1997	-3,076	11,045	0,345	-0,390	0,681	-9,262	15,496	13,019	-5,927	2,245
1998	-3,815	10,876	0,410	-0,334	-1,193	-11,743	17,890	15,683	-5,269	-4,470
1999	-4,236	13,324	0,428	-0,300	-1,198	-13,074	20,472	16,477	-5,188	-4,154
2000	-4,124	12,901	0,423	-0,338	-1,896	-13,241	23,049	17,032	-6,451	-6,987
2001	-5,230	13,584	0,468	-0,019	-1,971	-17,010	25,372	19,397	-0,281	-7,668
2002	-4,856	12,955	0,397	0,239	-1,169	-16,210	23,791	17,496	2,883	-4,109
2003	-4,867	13,318	0,407	0,012	-0,315	-16,156	22,779	17,648	0,162	-1,097
2004	-4,955	12,992	0,423	-0,192	-0,521	-16,821	20,639	18,538	-2,873	-1,830
2005	-5,297	14,269	0,461	-0,212	-1,993	-18,013	21,778	20,200	-3,380	-7,344
2006	-5,714	11,816	0,460	-0,036	-1,460	-22,395	21,616	23,038	-0,655	-5,957
2007	-5,971	12,528	0,470	-0,015	-2,336	-23,743	22,352	23,988	-0,291	-9,975
2008	-6,649	11,738	0,529	0,133	-3,303	-25,653	23,667	26,504	2,039	-13,833
2009	-5,609	8,276	0,391	0,354	-0,751	-24,937	19,099	23,241	6,047	-3,182
2010	-5,559	9,612	0,375	0,388	-1,622	-25,017	19,483	22,397	6,815	-6,326
2011	-6,384	10,692	0,441	0,491	-1,337	-26,408	20,954	24,515	7,657	-4,988
2012	-6,318	10,464	0,447	0,497	-1,749	-25,663	20,370	24,096	8,069	-6,211
2013	-6,304	10,551	0,431	0,588	-1,296	-25,385	20,612	23,089	9,952	-4,508
2014	-6,269	11,390	0,434	0,536	-1,046	-24,933	21,867	23,239	8,951	-3,826
2015	-6,097	10,937	0,432	0,446	-0,001	-24,209	21,656	22,848	7,782	-0,004
2016	-6,306	11,195	0,442	0,503	-1,682	-24,449	21,226	23,032	8,990	-6,009
2017	-6,150	11,231	0,428	0,481	-1,717	-23,463	20,844	21,902	9,035	-5,878
2018	-6,231	12,883	0,456	0,329	-2,273	-23,241	22,805	22,732	5,980	-7,584
2019	-6,548	12,887	0,485	0,330	-1,883	-23,776	22,534	23,749	5,677	-6,283
2020	-5,573	10,564	0,360	0,256	-1,447	-22,719	20,366	20,514	4,856	-5,310
2021	-5,954	13,962	0,380	0,356	-2,280	-22,728	23,564	20,574	6,856	-7,717
2022	-5,919	12,949	0,417	0,236	-1,757	-21,935	23,042	21,456	4,059	-5,960

The regression carried out for the entire period 1992-2022 confirms what has previously been studied in other literature regarding the role of company size and profitability in the decision to pay dividends. As can be seen from Table 5, larger companies are more likely to pay dividends (the slope for the size variable is 29.63 standard errors from zero) and more profitable

companies are also more likely to pay dividends (the slope for the E_t/A_t variable is 42.72 standard errors from zero). The company size variable always showed solid and positive slopes in all sample years (more than eight standard errors from zero), as was the case with the profitability variable (more than ten standard errors from zero). On the other hand, in accordance with the analysis previously carried out using summary statistics, the relationship between investment opportunities and the probability of paying dividends is not homogeneous, with the two variables showing inverse relationships. The V_t/A_t ratio shows a positive relationship with the dependent variable, while the dA_t/A_t ratio shows a negative relationship. To check the robustness of these results, like Dennis and Osobov (2008), the t-statistics of the average of the coefficients of the annual regressions were calculated using the method of Newey and West (1987) (Table A2), which is robust to autocorrelation up to four lags and to adjust the traditional standard errors to take account of the presence of autocorrelation in the residuals. The conclusion is the same: the variables continue to be significant using this method.

6. Dividend-paying trend: qualitative evidence

This section presents some preliminary results on whether the decline and later increase in companies paying dividends is due exclusively to changes in company characteristics. As it is possible to see in Figure 3, the decrease in the period 1992-2010 and 2018-2020 and the increase in the period 2010-2019 and 2020-2022 in the companies that pay dividends is not solely due to changes in company characteristics, because if it were, companies with specific characteristics would be just as likely to pay dividends now as in the past.

Figure 3 shows the percentage of companies that pay dividends that have positive ($Y_t > 0$) and negative ($Y_t < 0$) common stock earnings and the percentage of companies that pay dividends with earnings before interest that exceed investment outlays ($E_t > dA_t$) and earnings before interest do not exceed investment outlays ($E_t < dA_t$). In 1992, 86.81% of companies with positive common stock earnings paid dividends, a decrease compared to 2010, when 52.85% of profitable companies paid dividends. However, this percentage increased from 52.85% to 67.50% in 2019. In the year of the COVID-19 pandemic (2020), the lowest percentage of profitable companies paying dividends was recorded (around 51.91% of companies), with this percentage growing again after this year to 62.92% in 2022. The percentage of $E_t > dA_t$ companies paying dividends also fell from 79.72% in 1992 to 45.47% in 2010 and then increased to 58.79% in 2019. In the year of the pandemic, it went down and then went up again until 54.76% in 2022.

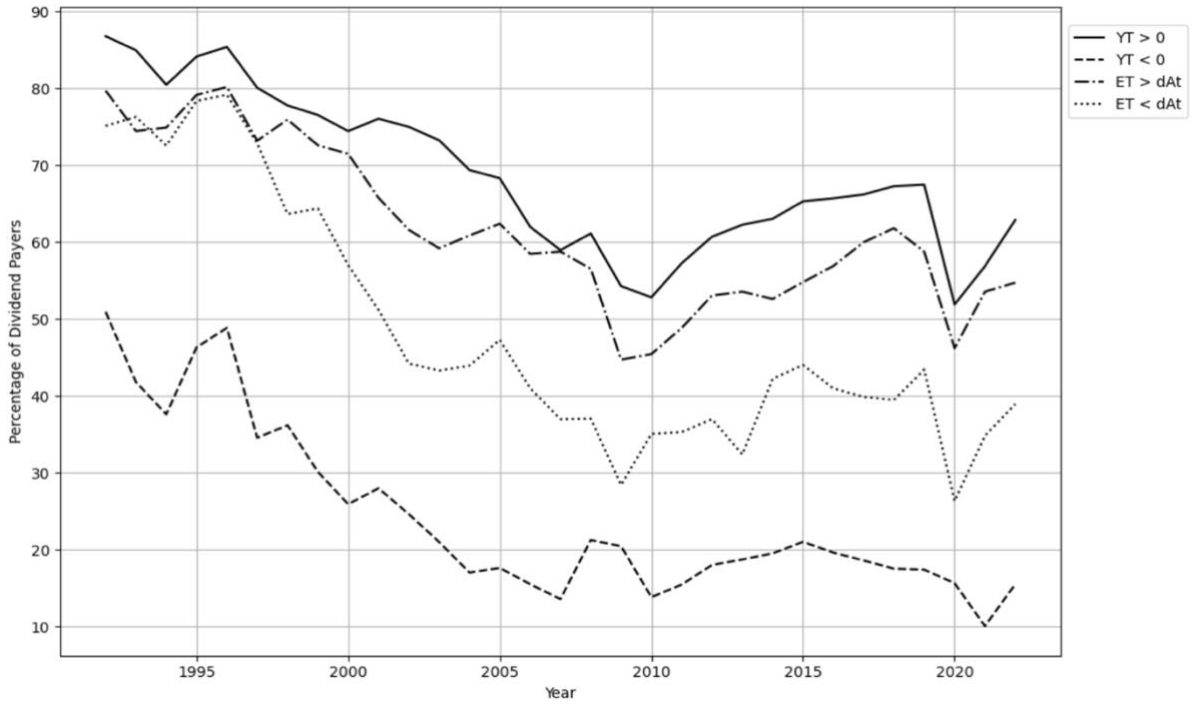

Figure 3: Percent of payers among firms with positive ($Y_t > 0$) and negative ($Y_t < 0$) earnings on common stock, and earnings before interest greater ($E_t > dA_t$) than and less ($E_t < dA_t$) than investment. Y_t is earnings available for common in year *t*; E_t is earnings before interest in year *t*; and dA_t, investment, is the change in the book value of assets from *t*-1 to *t*.

These results show that companies with the characteristics of dividend-paying companies (positive common stock earnings and earnings that exceed investment outlays) have become less likely to pay dividends until 2010. After that year, they became more likely to pay dividends. Although dividends are not as common in unprofitable companies, the same can be observed for companies with negative common stock earnings and those with earnings lower than investment outlays. The proportion of companies paying dividends with negative earnings has fallen sharply, from 50.96% in 1992 to 13.87% in 2010, increasing slightly to 15.55% in 2022, and the percentage of companies with earnings lower than investment has also fallen, from 75.15% in 1992 to 35.08% in 2010. In 2020, it reached the lowest percentage of 26.35% and then increased to 38.97% in 2022. In short, it can be concluded that, regardless of their characteristics, companies have become less likely to pay dividends since 1992. However, from 2010 onwards, the scenario began to reverse, with companies becoming more likely to pay dividends.

7. Dividend-paying trend: quantitative evidence

In this section, two methods were used, logit regressions and the portfolio approach, to quantify the effects of changing characteristics and the propensity to pay on the percentage of dividend payers. In both methods, the base period chosen was from 1992 to 2010 to study these effects on the increase in the percentage of companies paying dividends after 2010. In addition, inferring over a shorter period limits the ability to fully address changes in the propensity to pay dividends over time and allows for a more precise analysis since the longer the period to be analyzed and the shorter the base period, the greater will be the changes in the propensity to pay dividends[1] over time. Thus, unlike Fama and French (2001), who used a base period of 15 years to infer 21 years, this study used a base period of 19 years to infer 13 years to mitigate this problem.

7.1 Regression estimates

7.1.1 Methodology

In this method, the procedure used was as follows: the average of the coefficients of the annual logit regressions for the base period from 1992 to 2010 were estimated, and after that, these values were used to calculate the linear combination for the companies in the sample in all subsequent years given the characteristics of the companies in each year, in order to calculate then the probability of the companies paying dividends from 2011 to 2022. The sum of the probabilities for each year divided by the total number of companies that existed in that year will be the expected percentage of companies paying dividends in that year. The equation for the logit regressions is given by:

$$p\,(y = 1) = \frac{1}{1 + e^{-z}}$$

$$z = b_1 + b_2 x_2 + \cdots + b_n x_x$$

[1]This has been tested using a base period of half the initial period (1992 to 2006) and using the base period of 1992 to 2002, and the values of expected percent and the difference between the expected percent and actual percent of payers are also higher; however, the conclusions are the same. The expected percentage increases from the beginning of the year under analysis until the last year, and the gap gets smaller over time.

Where p represents the probability of a company paying dividends and z represents the real number given by the linear combination of the independent variables. In this case:

$$z(Div_{it}) = b_0 + b_1 Profitability_{it} + b_2 Investments\ Opportunities_{it} + b_3 Size_{it} + \varepsilon_{it}$$

Finally, the difference between the expected percentage and the actual percentage of companies paying dividends represents the change in the propensity to pay dividends. A decline in the propensity to pay dividends implies a positive difference between the expected and the actual percentage that increases over time. Since the coefficients from the base period were used to calculate the probabilities for the years following the base period, variations in the expected percent of payers after 2010 are due to changes in the companies' characteristics.

7.1.2 Results

Table 6 shows the expected percentages of dividend payers obtained by applying the average annual coefficients of the logit regressions from the base period of 1922-2010 to the samples of company characteristics from subsequent years. To explain the probability of paying dividends, in this regression, the variables used were size (logarithm of total assets), profitability (E_t/A_t), and the two measures used to measure investment opportunities (V_t/A_t and dA_t/A_t).

Through the results obtained, it is possible to verify that the expected percent of dividend payers increased from 56.36% in 2011 to 59.56% in 2022; this difference of 3.2 percentage points suggests that the characteristics of the companies contribute, although only slightly, to the increase in the percentage of dividend payers. It is also possible to conclude that companies have had a greater propensity to pay dividends since the difference between the expected and the actual percentage was 14.05 percentage points in 2011 and has been decreasing until 2019, reaching a difference of only 8.66 percentage points in 2019, meaning that this model for predicting the propensity to pay dividends is very similar to reality, which has been an increase, although not yet very significant, in companies that pay dividends. However, as expected, in the year of the pandemic, the gap was at its widest, at around 20.25 percentage points, but after that year, the gap narrowed again until 2022, reaching a gap of 13 percentage points. It is important to note that it is normal for this evolution of the expected percentage of companies paying dividends and the difference between the expected percentage of dividend payers and

the actual percentage of dividend payers not to be so significant and impactful since the percentage of companies paying dividends has increased by small amounts since 2011 to 2019, with an increase of only 11 percentage points from 2011 to 2019. Furthermore, the COVID-19 pandemic in 2020 contributed to a large decrease in companies paying dividends, around 13 percentage points compared to 2019 (more than the increase that occurred from 2011 to 2019), recording, however, a recovery of this percentage from 2020 to 2022.

Table 6: Estimates of the logit regressions of the effect of the change in characteristics and the increase in the propensity to pay on the percentage of companies that pay dividends.

All companies for each year of the 1992-2010 base period were used to estimate logit regressions that explain whether a company pays dividends. The explanatory variables are profitability (E_t/A_t), the growth rate of assets (dA_t/A_t), the market-to-book ratio (V_t/A_t), and the logarithm of total book assets (size). Firms is the number of companies in the sample for each year. Payers are the number of dividend payers. Actual percent is the percentage of payers (the ratio between the number of payers and the total number of companies, times 100). The Expected percent of payers for a year *t* is estimated by applying the average of the annual coefficients of the logit regression for the base period to the values of the explanatory variables for each company for year *t*, summing the value of the companies' probabilities, dividing by the number of companies, and then multiplying by 100. The evolution of the Expected percent measures the effects of the change in characteristics on the percentage of dividend payers. Expected percent - Actual percent measures the effect of the propensity to pay.

	Firms	Payers	Actual percent	Expected percent	**Expected - Actual**
1992-2010	55219	35053	63,48		
2011	5249	2221	42,31	56,36	14,05
2012	4883	2185	44,75	56,33	11,58
2013	4724	2165	45,83	56,94	11,11
2014	4650	2190	47,10	57,34	10,24
2015	4528	2237	49,40	58,33	8,92
2016	4452	2234	50,18	59,78	9,60
2017	4421	2238	50,62	60,29	9,66
2018	4505	2277	50,54	59,57	9,02
2019	4491	2239	49,86	58,51	8,66
2020	4415	1615	36,58	56,83	20,25
2021	4556	1864	40,91	59,42	18,50
2022	4446	2048	46,06	59,56	13,49

7.2 Estimates of base period probabilities from portfolios (robustness of results)

7.2.1 Methodology

Another method was used to test the robustness of the results found using logistic regressions and also to deal with any problems of misspecification that may exist when using logistic regressions to infer about the characteristics and probability of a company paying dividends. First, 27 portfolios were created for each year from 1992 to 2010 by classifying the companies into three equal groups in terms of size (logarithm of total assets), profitability (E_t/A_t), and investment opportunities (dA_t/At or V_t/A_t). As Fama and French (2001) did, in this study, either V_t/A_t or dA_t/A_t was used to have a manageable number of portfolios to measure investment opportunities. We estimated the probabilities of companies paying dividends in each portfolio in the base period as the sum of the number of companies paying dividends in the portfolio over the 19 years from 1992 to 2010 divided by the total number of companies in the portfolio.

The results in Table 7 indicate what was seen earlier: larger companies are more likely to pay dividends; after controlling for profitability (E_t/A_t) and investment opportunities (V_t/A_t or dA_t/A_t), the 1992-2010 probability of companies paying dividends increases with the size of the companies. More profitable companies are also more likely to pay dividends; after controlling for size and investment opportunities, 1992-2010 portfolios with high profitability have higher proportions of dividend payers than those with lower profitability. Finally, as we have seen above, the relationship between companies paying dividends and their investment opportunities is inconsistent. In this analysis, the companies in the medium investment opportunity class generally have the highest percentage of dividend payers, although this is not always the case. This is most noticeable when the variable dAt/At is used to measure investment opportunities.

To form the portfolios after 2010, breakpoints designed to have the same economic significance as those from the 1992-2010 base period were used. The breakpoints for each variable in the base period are the 33.33% percentile and the 66.66% percentile, to divide each variable into three groups. It was assumed that the values of size, E_t/A_t, V_t/A_t, and dA_t/A_t have a constant meaning. The breakpoints of the variables used to measure profitability, size, and investment opportunities after 2010 are the averages across the years of the 1992-2010 base period breakpoints. Keeping the breakpoints constant, in the years after 2010, the distribution of companies between size, E_t/A_t, V_t/A_t, and dA_t/A_t groups varies with changes in the distribution

of these characteristics between companies. The expected percentage of dividend payers for a given year t after 2010 is given by:

$$Ep_t = \frac{\sum_{i=1}^{27} n_{it} p_i}{N_t} \times 100$$

Where n_{it} is the number of companies in portfolio *i* in year *t*, N_t is the total number of companies in year t and p_i is the expected proportion of dividend payers in portfolio i, estimated as the actual percent of dividend payers for 1992-2010. Since the expected proportion of payers in a portfolio is fixed at the 1992-2010 base period, the aggregate expected percentage of payers varies over time because changes in firm characteristics alter the distribution of firms across the 27 portfolios and, therefore, the evolution of the expected percentage of payers after 2010 is due to changes in the characteristics of companies. Once again, the difference between the expected and the actual percentage of companies that pay dividends measures the effect of changes in the propensity to pay dividends.

7.2.2 Results

When we use the V_t/A_t variable to measure investment opportunities, using this method, the expected percentage of dividend payers is 51.86% (Table 8), increasing to 54.14% in 2022. This means that, according to the portfolio method, the change in company characteristics contributed to the increase in dividend-paying companies from 2011 to 2022 by around 2.28 percentage points. From 2020 to 2022, the expected percentage of payers increased by about 3.29 percentage points. The expected percentage of payers in 2011 is very similar to the actual percentage of payers, and the difference between these two categories is getting smaller and smaller over time, reaching a difference of just 3.76 percentage points in 2019. The decrease in this differential and the fact that it is tiny indicates an increase in the propensity of companies to pay dividends, and this increase in the propensity to pay dividends contributed to an increase in companies paying dividends of around 5.79 percentage points from 2011 to 2019. As expected, the differential increased in the year of the pandemic to about 14.27 percentage points, but then decreased to 8.07 percentage points in 2022. When dA_t/A_t is used to measure investment opportunities, the conclusions are the same, as there is little change in the values of the expected percentage of dividend payers. In short, like the logit regressions, changes in company characteristics and the increased propensity to pay dividends have contributed to the increase in the percentage of companies that pay dividends from 2010 to 2022.

Table 7: Percentages of dividend payers in 27 portfolios formed on size, profitability, and investment opportunities.

Each year, we form two sets of 27 portfolios of European companies, using classifications of profitability (E_t/A_t), market/book ratio (V_t/A_t), asset growth (dA_t/A_t), and size (logarithm of total assets). In each of the 19 base years, 1992-2010, companies were classified into three groups equal in size: E_t/A_t, V_t/A_t, and dA_t/A_t. In the years after 2010, we use the average breakpoints for 1992-2010 to assign firms to the three groups of E_t/A_t, V_t/A_t, and dA_t/A_t. The 27 portfolios are the intersections of the size, E_t/A_t, and V_t/A_t or dA_t/A_t groups. The table shows annual values and averages of annual values of the percent of the firms in the portfolios that pay dividends.

	Investment variable is Vt/At								
	High Et/At			Medium Et/At			Low Et/At		
	High	Vt/At	Low	High	Vt/At	Low	High	Vt/At	Low
					Small firms				
1992-2010	60,32%	65,63%	52,66%	39,48%	49,42%	44,42%	6,21%	16,69%	15,43%
2011	50,00%	50,96%	30,08%	30,00%	28,30%	27,16%	4,32%	8,05%	8,76%
2012	54,81%	51,47%	30,28%	34,72%	34,94%	23,65%	6,13%	10,53%	11,52%
2013	64,34%	42,19%	23,75%	35,90%	33,33%	28,57%	6,00%	12,32%	10,82%
2014	57,14%	55,17%	24,72%	43,96%	34,18%	27,38%	6,50%	9,30%	9,92%
2015	66,24%	51,06%	28,21%	45,95%	37,31%	25,79%	6,23%	11,67%	9,37%
2016	65,22%	33,33%	29,87%	38,46%	39,66%	33,33%	4,61%	11,56%	8,54%
2017	56,55%	52,78%	26,79%	34,67%	43,48%	26,56%	4,88%	10,00%	11,16%
2018	67,38%	51,22%	25,71%	40,30%	35,71%	31,67%	4,71%	11,36%	9,17%
2019	51,41%	53,33%	37,04%	34,48%	40,00%	32,79%	4,69%	8,56%	10,07%
2020	49,19%	25,71%	19,67%	17,86%	30,77%	25,45%	4,21%	6,82%	12,02%
2021	54,11%	42,50%	20,90%	30,95%	34,00%	26,58%	3,45%	5,69%	8,51%
2022	61,40%	35,19%	36,07%	24,24%	34,55%	17,57%	5,07%	8,75%	11,36%
					Medium-sized firms				
1992-2010	81,49%	79,03%	69,00%	61,35%	68,87%	65,29%	23,16%	33,06%	33,10%
2011	77,24%	70,45%	40,24%	68,52%	59,44%	49,19%	16,67%	29,22%	20,41%
2012	76,73%	65,63%	42,03%	65,31%	73,11%	49,61%	19,48%	28,21%	25,36%
2013	83,33%	73,75%	38,46%	67,11%	62,20%	48,11%	27,71%	33,53%	22,67%
2014	83,70%	65,06%	45,45%	80,25%	69,33%	45,55%	21,93%	38,71%	22,78%
2015	79,31%	65,33%	47,87%	73,86%	69,17%	50,78%	22,22%	32,17%	22,80%
2016	80,91%	70,59%	44,57%	71,84%	69,77%	49,16%	15,83%	33,80%	26,43%
2017	82,38%	61,54%	46,05%	70,90%	67,27%	48,23%	21,79%	34,21%	25,13%
2018	78,24%	69,74%	50,77%	58,88%	61,60%	50,00%	16,31%	34,87%	26,02%
2019	78,98%	68,35%	33,78%	64,13%	71,32%	52,54%	21,74%	29,25%	22,62%
2020	64,85%	41,79%	33,77%	51,04%	48,39%	41,41%	12,04%	19,75%	20,23%
2021	65,25%	41,89%	39,44%	47,92%	58,25%	38,78%	10,12%	20,80%	16,78%
2022	72,61%	61,46%	52,34%	52,33%	63,20%	49,66%	10,90%	22,67%	23,14%
					Big firms				
1992-2010	87,23%	87,86%	80,17%	80,22%	83,37%	78,78%	51,60%	56,54%	50,96%
2011	89,92%	73,30%	67,20%	86,15%	79,74%	66,87%	46,15%	57,52%	41,93%
2012	90,32%	81,48%	63,29%	83,95%	84,75%	66,31%	52,94%	67,10%	43,19%
2013	87,21%	82,19%	62,18%	85,94%	82,61%	64,29%	73,97%	60,33%	41,08%
2014	87,88%	75,18%	70,00%	84,14%	82,78%	65,05%	62,65%	64,65%	36,91%
2015	88,36%	82,44%	64,55%	85,48%	79,93%	64,44%	67,39%	64,82%	46,91%
2016	87,57%	77,44%	59,13%	87,37%	82,40%	67,35%	71,15%	67,78%	43,46%
2017	90,10%	77,03%	53,21%	84,02%	85,41%	61,82%	58,78%	55,41%	42,41%
2018	90,84%	77,06%	58,88%	85,51%	85,86%	65,77%	58,10%	59,12%	50,00%
2019	91,80%	79,19%	76,36%	86,32%	84,62%	69,50%	50,57%	68,78%	48,45%
2020	81,08%	68,57%	54,12%	65,52%	62,43%	54,90%	38,46%	42,59%	36,52%
2021	85,90%	74,53%	52,89%	69,06%	71,13%	63,16%	26,88%	32,06%	34,83%
2022	88,35%	85,56%	70,59%	78,52%	67,82%	72,52%	38,37%	39,64%	50,00%

Table 7 (continued)

	Investment variable is dAt/At								
	High Et/At			Medium Et/At			Low Et/At		
	High	Vt/At	Low	High	Vt/At	Low	High	Vt/At	Low
					Small firms				
1992-2010	54,68%	71,04%	58,82%	37,68%	52,13%	45,62%	6,01%	17,61%	13,07%
2011	37,09%	51,03%	42,47%	13,73%	39,08%	24,65%	4,68%	10,04%	7,12%
2012	36,76%	57,94%	43,48%	22,43%	33,99%	26,53%	5,60%	11,58%	10,03%
2013	31,71%	61,26%	46,81%	24,19%	35,71%	29,93%	4,31%	11,34%	10,37%
2014	38,06%	63,44%	41,79%	31,11%	39,19%	27,00%	3,24%	11,21%	10,06%
2015	50,93%	56,31%	52,11%	31,25%	36,92%	30,00%	5,03%	11,71%	8,54%
2016	35,56%	61,22%	54,35%	20,00%	41,74%	36,07%	2,09%	10,56%	8,42%
2017	40,18%	59,80%	50,00%	32,79%	35,04%	29,73%	1,36%	9,84%	10,29%
2018	40,00%	64,84%	57,38%	27,42%	34,82%	40,96%	3,36%	9,88%	8,28%
2019	41,67%	59,78%	41,51%	27,27%	30,69%	45,57%	5,36%	12,02%	5,91%
2020	28,87%	50,79%	36,67%	15,09%	34,44%	20,00%	2,15%	12,85%	7,54%
2021	41,35%	53,33%	33,33%	25,61%	30,95%	36,17%	2,39%	8,60%	5,70%
2022	42,11%	56,99%	43,33%	14,63%	30,61%	21,43%	6,93%	8,72%	7,59%
					Medium-sized firms				
1992-2010	74,90%	84,30%	75,06%	62,64%	71,59%	63,00%	22,68%	39,17%	31,42%
2011	50,31%	71,22%	58,44%	43,38%	60,00%	54,17%	20,34%	22,10%	22,88%
2012	53,01%	72,02%	57,63%	59,81%	60,59%	51,72%	18,87%	34,87%	21,15%
2013	54,65%	77,06%	64,71%	53,45%	59,41%	52,26%	13,04%	37,82%	24,29%
2014	61,72%	75,84%	71,79%	62,50%	64,52%	51,38%	19,86%	42,86%	19,66%
2015	66,67%	79,25%	51,72%	61,62%	67,15%	50,93%	19,05%	37,18%	20,54%
2016	69,57%	76,13%	62,73%	47,31%	64,85%	66,38%	13,16%	32,68%	25,77%
2017	68,57%	78,57%	57,53%	54,55%	65,99%	59,55%	16,81%	36,26%	24,64%
2018	64,34%	76,88%	70,91%	55,86%	60,68%	45,63%	15,20%	30,07%	29,38%
2019	64,54%	71,62%	52,50%	54,07%	68,11%	57,69%	20,00%	33,55%	20,60%
2020	48,31%	60,50%	44,44%	42,86%	51,01%	43,52%	10,84%	25,83%	17,06%
2021	53,42%	65,49%	41,18%	42,51%	52,10%	46,67%	8,41%	18,29%	19,01%
2022	51,88%	75,56%	67,69%	50,00%	57,23%	58,67%	11,94%	24,84%	20,00%
					Big firms				
1992-2010	83,27%	89,98%	84,39%	80,80%	84,32%	76,58%	48,63%	60,16%	51,66%
2011	74,06%	83,02%	69,57%	75,93%	76,47%	63,08%	39,24%	56,98%	39,52%
2012	74,25%	87,54%	73,75%	69,06%	80,67%	70,34%	23,44%	64,25%	49,39%
2013	68,48%	86,74%	77,89%	69,44%	80,14%	74,50%	51,22%	60,90%	50,00%
2014	78,54%	83,98%	78,16%	76,74%	83,23%	62,10%	51,46%	61,57%	41,71%
2015	84,13%	85,94%	73,91%	83,63%	78,05%	66,91%	48,00%	67,51%	52,32%
2016	71,64%	83,60%	79,19%	78,51%	81,09%	76,50%	53,16%	68,23%	51,10%
2017	72,19%	85,51%	80,00%	70,21%	83,78%	76,88%	35,21%	61,04%	50,68%
2018	70,45%	87,22%	83,33%	73,53%	82,28%	79,10%	43,02%	65,58%	48,48%
2019	79,26%	88,75%	87,69%	75,00%	84,56%	73,12%	47,83%	66,52%	48,84%
2020	52,94%	80,37%	73,79%	54,89%	63,31%	61,62%	30,28%	45,91%	37,70%
2021	75,35%	80,38%	74,07%	61,13%	75,94%	53,85%	22,84%	36,48%	32,89%
2022	78,01%	88,49%	77,78%	68,87%	76,28%	60,64%	38,26%	47,92%	44,44%

Table 8: Effects of changing characteristics and propensity to pay on the percent of firms paying dividends, estimated from 27 portfolios formed on size, profitability (E_t/A_t), and investment opportunities (V_t/A_t or dA_t/A_t).

Firms is the number of firms in the sample for a year. Actual Percent is the percent of payers (the ratio of payers to firms, times 100). The Expected Percent of payers for a year is the number of firms in each of the 27 size - E_t/A_t - V_t/A_t portfolios (or the 27 size – E_t/A_t – dA_t/A_t portfolios) for the year times the proportion of dividend payers in the portfolio during the base period, summed over the 27 portfolios, divided by the total of firms in the 27 portfolios for the year, and then multiplied by 100. The Expected percent change over time due to changes in the characteristics of sample firms. Expected percent – Actual percent measures the effect of changing propensity to pay.

				Vt/At		dAt/At	
	Firms	Payers	Actual percent	Expected percent	**Expected - Actual**	Expected percent	**Expected - Actual**
1992-2010	55219	35053	63,48				
2011	5249	2221	42,31	51,86	9,55	52,96	10,65
2012	4883	2185	44,75	51,43	6,68	52,53	7,78
2013	4724	2165	45,83	51,54	5,71	52,51	6,68
2014	4650	2190	47,10	52,18	5,09	53,09	6,00
2015	4528	2237	49,40	53,43	4,03	54,54	5,14
2016	4452	2234	50,18	54,13	3,95	55,41	5,23
2017	4421	2238	50,62	55,00	4,38	56,33	5,70
2018	4505	2277	50,54	54,68	4,13	56,02	5,47
2019	4491	2239	49,86	53,61	3,76	54,86	5,00
2020	4415	1615	36,58	50,85	14,27	51,74	15,16
2021	4556	1864	40,91	54,27	13,36	55,25	14,34
2022	4446	2048	46,06	54,14	8,07	55,65	9,59

8. Summary of total change

To summarize the results obtained, the period from 2011 to 2022 was divided into two subperiods: before the pandemic (2020) and after the pandemic. To see the percentage that each factor (change in the characteristics of companies and propensity to pay) contributed to the increase in the percentage of companies paying dividends after 2010, the following formulas were used:

Total change = change from firm characteristics + change propensity to pay

$$\frac{\text{Change from the propensity to pay}}{\text{total change}} = 1 - \frac{\text{Change from firm characterisitics}}{\text{Total change}}$$

Where the change from firm characteristics represents the evolution of the expected percent and the change in propensity represents the evolution of the difference between the expected percent and the actual percent of dividend payers. Using the logit regressions, before 2020, the expected percentage of dividend payers evolved from 56.36% to 58.51% in 2019, a difference

of 2.15 percentage points. About the propensity to pay dividends, the difference between the expected percentage and the actual percentage decreases from 14.05% to 8.66%, a difference of 5.39 percentage points. Thus, the change in company characteristics contributed approximately 28.51% to the increase in the percentage of paying companies, and the increase in the companies' propensity to pay dividends contributed the remainder, 71.49%. From 2020 to 2022, the expected percentage of payers increased by 2.73 percentage points, contributing around 28.76% to the increase in paying companies, and although from 2019 to 2020, the difference between the expected percent and the actual percent raised, it fell again from 2020 to 2022 by around 6.76 percentage points, contributing 71.24% to the increase in dividend payers. From a more general point of view, from 2011 to 2022, the change in company characteristics and the increase in companies' propensity to pay dividends contributed 85.11% and 14.89%, respectively, to the increase in dividend-paying companies.

By the portfolio approach, using the market-to-book ratio as a measure of investment opportunities, before 2020, 23.21% of the phenomenon of the reappearance of dividends from 2010 to 2019 is explained by the change in the characteristics of the companies and the change in the propensity to pay corresponds to the remaining 76.79%. From 2020 to 2022, the change in characteristics contributed 34.67%, and the change in propensity contributed 65.33%. Looking at the whole period from 2011 to 2022, the change in total dividend payers is due to 60.64% changes in characteristics and 39.36% changes in propensity to pay. Using the growth rate of assets as a measure of investment opportunity, before 2020, around 25.17% of the growth pattern was due to changes in characteristics, and the remaining 74.83% was due to changes in propensity. After 2020, 41.24% is attributed to changes in characteristics and 58.76% to changes in propensity. Overall, from 2011 to 2022, 71.73% of the change in company characteristics counts towards the total change in dividend payers and 28.27% corresponds to changes in propensity.

In conclusion, when divided into two subgroups, the change in the propensity to pay dividends represents a more significant part of this change in the percentage of dividend payers. Looking at the entire period under analysis, the change in company characteristics significantly contributes to increasing the percentage of dividend payers.

9. Conclusion

This dissertation aims to study the impact of specific determinants previously studied in other literature on the probability of companies paying dividends and to analyze the evolution of companies in Europe that pay dividends from 1992 to 2022 and, above all, to analyze the period of reappearance of dividends after 2010 and the factors that contributed to this reappearance.

Concerning the determinants studied, larger and more profitable companies are more likely to pay dividends in any year of the study. However, the effect of investment opportunities on the likelihood of paying dividends is mixed since, in some years, paying companies present more investment opportunities than non-payers, and in others, they do not. However, on average, companies that pay dividends present more investment opportunities over the period. Looking at the two groups formed that belong to the non-payers group, companies that have never paid dividends stand out for having the best investment opportunities compared to any of the other groups, on average over the period and in practically every year, and for having more investment expenses than earnings. On the other hand, former payers have low profitability and few investment opportunities.

Regarding the evolution of companies that pay dividends, it was possible to verify two different patterns as in previous literature. However, unlike what was observed in the US, the disappearance of dividends lasted until 2010. After 2010, companies that pay dividends increased again, with a decrease at the time of the COVID-19 pandemic and an increase after the pandemic. A low propensity of companies to pay dividends is general from 1992 to 2010 since it was observed that during this period, companies with characteristics typical of companies that pay dividends (with positive common stock earnings and earnings that exceed investment outlays) decreased and increased again after 2010, showing that after 2010 the increase in the percentage of companies that pay dividends is due not only to a change in the characteristics of companies but also to a greater propensity to pay dividends.

In both methods used to quantify the effects of these changes on the probability of paying dividends, looking at the overall period from 2011 to 2022, the change in characteristics plays a more significant role in the increase in the percentage of companies paying dividends after 2010. However, the situation was reversed by dividing it into two subgroups before and after the pandemic. For example, using logistic regression that contains the two measures of investment opportunities, changes in company characteristics and the propensity to pay

dividends contributed to an increase in the percentage of dividends of 85.11% and 14.89%, respectively. When divided into two subgroups, the period before the pandemic (2020) and the period after the pandemic, in both subgroups, the change in the propensity to pay dividends has a greater contribution, 71.49% in the period before 2020 and 71.24% in the period after 2020.

In addition to the fact that this dissertation complements other literature on dividend policy since it covers a specific continent, future studies could be complemented by using more determinants of dividend policy and using different proxies for variables to obtain more robust results. In addition, it can be studied the behavior of companies that pay dividends in each sector rather than just companies in a specific region and add macroeconomic variables and events that may have affected the global economy and, consequently, the decision of companies to pay dividends in each sector. Finally, to make the results even more robust, the data could be divided into smaller sub-periods.

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11. Appendix

Table 9: Derived Variables

Derived Variables	*Proxies*	*Estimation*
Book Equity	BEt	Assets - Liabilities - Preferred Stock + Deferred Taxes and Investment Tax Credit if available
Market Value of Equity	MEt	Stock Price times Shares Outstanding
Market Value of Firm	Vt	Assets - Book Equity + Market Equity
Earnings before Interests	Et	Earnings Before Extraordinary Items + Interest Expense + Deferred Taxes if available
Earnings Available for Common	Yt	Net income after preferred dividends + Deferred Taxes if available

Table 10: Estimates of the t-statistics for the mean of the regression coefficients using the procedure of Newey and West (1987)

	Average Coefficients	Newey-West Standard Error	T-Statistic
const	-5,059	0,281	-18,003
Et/At	11,675	0,549	21,252
size	0,400	0,020	19,611
dAt/At	-1,113	0,303	-3,673
Vt/At	0,169	0,055	3,051