Special state aid measures during COVID-19 and corporate dividend policy: Early evidence from Polish public companies[1]

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Abstract: The main aim of this paper is to verify whether companies that received special state aid as part of anti-crisis help to mitigate the negative effects of the coronavirus pandemic decided to pay dividends in 2020. The probability of paying dividend was lower for companies that were granted state aid, the variable was statistically significant and the impact was relevant. Among Polish listed companies those ones that received state aid and paid dividends were of average size and age but had the highest level of cash ratio and the lowest level of debt. If a similar crisis occurs in the future the main task for policymakers will be to provide more directed and unambiguous aid for companies in order to avoid unproductive spending as well as to provide general rules that will restrict dividend payment for beneficiaries of any state-aid.

Keywords: COVID-19, state-aid, dividends, pay-out policy.

JEL codes: G10, G35, H76.

Introduction

According to the signalling theory (Bhattacharya, 1979) the market reacts negatively to information about reducing or discontinuing dividends while reacting positively to information about paying or raising dividends. At the same time dividend policy depends on many factors which include stock market

capitalization, net income, cash and debt (Brav, Graham, Harvey, & Michaely, 2005; Fama & French, 2002), growth opportunities (Lang & Litzenberger, 1989) or the age of the company (Leary & Michaely, 2011). However, the microeconomic characteristics of companies—crucial for determining dividend policy—are inextricably linked to what is happening on the macro level. For example Hauser (2013) pointed out that dividend cuts were a common result of the global financial crisis of 2007–2009. The tightening of dividend policy in the face of the crisis does not seem surprising, especially when the crisis had its origins in the financial sphere. However, Krieger, Mauck and Pruitt (2020) have shown that also the coronavirus pandemic contributed to significant reductions or even non-payment of dividends. While such action by companies seems intuitive and logical one might wonder how the dividend policy of companies corresponds to the aid that companies received to mitigate the negative effects of the pandemic and the restrictions introduced. Have the companies that received state aid paid dividends or have they waived dividends? In April 2020, i.e. at the beginning of the pandemic, Niamh Brennan (Sullivan, 2020) indicated that paying dividends while receiving state aid is "absolutely morally questionable". It is worth noting, however, that regulations formulated by the European Commission under the "Temporary State Aid Framework" (European Commission, 2020) do not prohibit the payment of dividends to companies that have received aid unless the company has used recapitalization aid instruments in connection with COVID-19. In addition to EU regulations, individual member states enact their own law that regulates the payment of dividends.

Considering the above the main objective of the study was to verify whether companies that received special state aid as part of anti-crisis help to mitigate the negative effects of the coronavirus pandemic decided to pay dividends in 2020. In order to achieve the main aim of this study the logit regression method was used. The analysis was based on data obtained for Polish companies listed on the main market of the Warsaw Stock Exchange as well as NewConnect.

To the best of the authors' knowledge, the proposed paper is one of the relatively few that address the issue of state aid and the dividend policy of companies during the coronavirus pandemic crisis. Authors such as Krieger and others (2020), Mazur, Dang and Vo (2020), Pettenuzzo, Sabatucci and Timmermann (2021) or Zechner, Cejnek and Randl (2020) analysed the potential impact of the coronavirus pandemic on company dividend policy while ignoring the issue of state aid received by these companies. The identified research gap prompts reflection on the issue of dividend payment by those economic entities which received state aid and to verify whether such practices took place and on what scale.

The paper is organised as follows. Section 1 addresses the dividend policy of public companies. Section 2 provides an overview of the assistance offered by states in addressing the negative outcomes of the coronavirus pandemic.

Section 3 presents the data used and the research method. Section 4 is dedicated to the discussion of the results and in the last section there are conclusions, as well as indications of the limitations and areas for future research.

1. Dividend policy

Company dividend policy can be considered from different perspectives. Different researchers analysed drivers influencing company decisions to pay dividends (Baker & Powell, 2000; Denis & Osobov, 2008; Fama & French, 2001), verify a company's inclination to pay dividends from the point of view of the source of financing theory (Fama & French, 2002; Rozeff, 1982), from the life-cycle theory (DeAngelo, DeAngelo, & Stulz, 2006), focusing on the signalling effect (Bernhardt, Douglas, & Robertson, 2005; Bhattacharya, 1979; DeAngelo, DeAngelo, & Skinner, 2000), or the catering theory (Baker & Wurgler, 2004; Pieloch-Babiarz, 2021). Miller and Modigliani (1961) showed that the valuation of the company does not change as a result of the adopted dividend policy in the world without taxation, transaction costs or other market imperfections. Years of analyses by numerous authors have successfully challenged the perfect market paradigm proving at the same time that dividend policy can affect the valuation and that the design of a company's dividend policy depends on many factors.

Managers are reluctant to change dividend policy (Lintner, 1956). Once they have started paying dividends to shareholders any decisions to withhold the payment of dividends are made with caution and uncertainty. This reluctance may result from the signal given to shareholders when dividends are paid or not paid. According to the signalling theory (Bhattacharya, 1979), the market reacts negatively to information about a suspension of dividend payment or a dividend cut while reacting positively when the company decides to pay or increase its dividends. On the other hand, the payment of dividends is closely related to the financial condition of the company and the profits it generates. As indicated by Fama and French (2001) dividend companies are large, profitable enterprises. DeAngelo and others (2006) emphasized that dividend-paying companies are mature companies with a stable market position and also few investment opportunities. A different view on the issue of dividend pay-out was held by Baker and Wurgler (2004) who noted that companies assume the role of suppliers that respond to investor demand and pay out dividends when investors seek such companies and give them a high valuation. However, they do not pay out dividends when the valuation of dividend companies and demand for such entities is low.

However, one may wonder whether companies will continue their earlier dividend policy when the economy faces shocks. A crisis will certainly constitute such a shock. The crisis of 2007–2009 or the current COVID-19 crisis

modify the decisions and thinking of entrepreneurs, managers and investors. On the one hand companies are reluctant to give up dividend pay-out but on the other their financial condition deteriorates significantly during the crisis. Investors on the other hand, due to increased uncertainty in the markets are looking for so-called safe havens or investments with a relatively low risk. Therefore, dividend companies can be such a safe haven.

Previously conducted research has shown that generally a crisis has a negative impact on pay-out policy. This was confirmed by Hauser (2013) and Krieger and others (2020) who showed that a crisis (no matter what type) negatively affects dividend pay-out. At the same time Chay and Suh (2009) and Walkup (2016) noted that cash flow uncertainty has a strong and negative impact on both the size of the dividend paid and the likelihood of the pay-out. Pettenuzzo and others (2021) also proved that during the pandemic crisis there was a great number of dividend suspensions: "Dividend suspension numbers during the Great Recession are dwarfed by their counterparts during the pandemic" (Pettenuzzo et al., 2021, p. 10). During the pandemic (taking into consideration only a few months in 2020) 219 dividend suspensions were announced in the U.S. while during the global financial crisis 135 dividend suspensions were reported. Similar results were obtained by Ali (2021) who noticed that during the COVID-19 period relatively higher rates of dividend reductions and omissions could be witnessed. However, Ali (2021) also outlined that the majority of firms could either maintain or increase dividends during the pandemic. Interesting research was also conducted by Andrzejczak (2021) who tried to assess the impact of the COVID-19 pandemic on the finances of economic entities from the perspective of the structure of financing, investments and dividend policy. Unfortunately, Andrzejczak (2021) conclusions state that currently it is difficult to identify the pattern of changes to the flows in the discussed categories.

The COVID-19 crisis is different than those faced before. The source of the crisis is different and the reactions of the states are intensified. In order to mitigate the negative effects of the coronavirus pandemic many states created a catalogue of relief instruments. These instruments can provide additional financial sources and help many companies to survive.

2. State-aid during COVID-19 crisis

From a corporate finance perspective, a global recession poses liquidity and profitability risks. In the current crisis caused by the global outbreak of the SARS-CoV-2 virus companies are facing additional, specific problems—overnight many of them were deprived of the possibility of generating revenue and consequently of the need to cover fixed costs, pay public levies and comply with legal obligations (so-called compliance).

Therefore, most countries in the world implemented a number of solutions to limit the negative outcomes of the pandemic on their economies. The range of these solutions is very broad and varies by state, industry, or company size and additionally has changed over time. However, this aid can be divided into several basic groups:
– non-refundable transfers of funds paid to enterprises, e.g. grants, subsidies, co-financing of part of the costs which will not have to be repaid if certain conditions are met—e.g. maintaining business activity for a certain period of time, maintaining jobs, etc.
– state transfers that will have to be paid back but on preferential terms—e.g. credits or loans.
– instruments of a fiscal nature—e.g. exemption from paying public levies, deferral of their payment in time, accelerated tax refunds, retrospective tax loss recognition, excluding received aid from income, or other tax allowances.
– providing guarantees to enable commercial borrowing or loans, or to subsidize costs of external financing.
– deferral of deadlines to meet obligations under applicable law (European Commission, n.d.; KPMG, 2020).

Not all businesses have taken and continue to take advantage of the full catalogue of aid their state offers since governments differentiate their aid by making it conditional on a number of factors. More aid is being provided to businesses in industries that have been shut down centrally (e.g. the tourism or entertainment industries) or which are experiencing larger declines in turnover or earnings compared to the pre-pandemic period. The aid may also depend on the size of the company including mainly headcount (instruments aimed at protecting jobs). The solutions most desired by companies are non-repayable cash transfers, however, the lack of the obligation to pay public-law liabilities is not without significance either.

Most countries are free to design aid instruments with budget appropriations being the only limitation. On the other hand, countries belonging to the European Union are in a specific situation as they have to comply with the principles of the common market and healthy competition. However, to mitigate the harsh economic impact and save businesses the European Commission introduced the most flexible state aid rules ever (European Commission, 2020). They allow member states to provide direct support to businesses most affected by the pandemic and being at risk of closure if the businesses do not receive it. The funds received from the state are intended to ensure that companies stay in business or can temporarily suspend operations without adversely affecting long-term growth prospects.

However, it should be emphasized that the use of aid measures is associated with certain restrictions. These restrictions include legal regulations that relate to the payment of dividends by companies that received aid from the state. For example, in the case of Polish companies the possibility of dividend payments

depends on the size of the company and the institution granting the aid. Large companies that have benefited from aid granted by the Polish Development Fund are not allowed to pay out dividends. However, such a restriction does not apply to micro-, small- and medium-sized enterprises and companies that have benefited from other sources of financing provided that the dividend payment is not financed with funds from the aid granted under the anti-crisis help. In addition consideration should be given to public opinion which began to respond in a negative way to news that companies which received state aid were paying dividends (Sullivan, 2020).

Taking the above into account it was decided to extend the existing research on company dividend policy, or dividend policy in times of crisis with an analysis that takes into account the additional factor of state aid.

3. Data and methodology

In order to achieve the main objective of the study it was decided to use a logit model for analysis. In the following subsections the data sources and the specificity of individual variables are presented.

3.1. Data

The study includes Polish companies listed on the main trading floor and NewConnect of the Warsaw Stock Exchange according to the 2020 stock market yearbook. The modelling excludes financial and insurance companies and all companies with negative equity (if equity was negative in 2019).

After removing companies with incomplete data analysed sample had 457 observations (the total sample size before corrections was 604 companies). The main source of data was the Orbis (n.d.) database published by Bureau van Dijk. Additionally, the 2021 stock market yearbook was used to determine whether or not the company paid a dividend. Microeconomic data were taken for the years 2018–2020.

In addition to the data taken from the financial statements, a variable that indicated whether the company received state aid due to the coronavirus pandemic was also introduced into the model. Information on state aid was taken from the local database SUDOP (n.d.). SUDOP is a public aid data sharing system, an official, government website with an open access. In the study every type of aid that companies received in 2020 to counteract the negative effects of the coronavirus pandemic (taking into account both exemptions, transfers of funds and other instruments that were included in the database under the keyword: COVID) were included.

3.2. Methodology

In the study a logit model was used whose general form is as follows:

$$P_i = \frac{e^{x_i \times \beta}}{1 + e^{x_i \times \beta}} \tag{1}$$

The logit model used has the form of a binomial model. Two different models were built where the dichotomous variable Y was:

1) in the first model the payment of dividend, i.e., the variable Y takes the value of 1 when the company paid dividend in 2020, and the value of 0 when the company did not pay dividends in 2020,
2) in the second model the dividend cut, i.e., the variable Y takes the value of 1 when the company paid dividend in 2020 but it was lower than in 2019, and the value of 0 in other cases (so a lack of dividend, no change or increase in dividend payment).

A number of explanatory variables and three control variables were introduced into the model as well (Table 1). The study used the same set of vari-

Table 1. Control variables

Variable's full name	Abbreviation in model	Formula
state aid under COVID-19	state_aid_covid	binary variable 1—if the company received aid in 2020 0—if the company did not receive aid in 2020
size of enterprise	size	ln (market capitalization in EUR thous.)
cash level	cash	cash and cash equivalents/total assets
debt	debt	total debt*/total assets
return on assets	ROA	net earnings/total assets
age of the company	age	2019—date of incorporation (in years)
growth opportunities	growth**	dynamics of total assets = = total assets 2019/ total assets 2018
dividend policy	div_policy	binary variable 1—if the company paid dividends in 2019 and 2018 0—if the company did not pay dividends in 2019 or 2018

  * long term debt + loans.
** Krieger and others (2020) measured growth opportunities as the market value of total capital over the book value of total assets. Fama and French (2001) measured growth opportunities in two ways: as the ratio of the aggregate market value over the aggregate book value of assets but also as the dynamics of total assets. The same for Denis and Osobov (2008).

Source: Own compilation.

ables that was used by Krieger and others (2020). At the same time the authors based their studies on the approach of Brav and others (2005), and Fama and French (2002). Given the purpose of the study in addition to the standard set of variables it was crucial to introduce a variable into the model that would indicate whether the company received state aid in countering the negative effects of the COVID-19 pandemic. The above requirement was solved by using a binary variable.

In addition to the control variables proposed by Krieger and others (2020) one additional binary variable characterizing the company's dividend policy was introduced into the model. All non-binary explanatory variables are calculated for 2019. The adoption of 2019 in the modelling is caused by the fact that dividends are paid out of profits generated by companies in the previous year. In addition, the decision to pay dividends is made during the following financial year and not at the end of the financial year, hence it would be inappropriate to build variables based on data for the completed year 2020. Table 1 presents the explanatory and control variables.

4. Empirical results

In this part a general description of the companies and the modelling results were presented. In the appendix the correlation matrix and VIF examination can be found. The robustness tests were also provided in the appendix.

4.1. Sample characteristic

The sample included 457 companies from the Warsaw Stock Exchange of which 121 decided to pay a dividend in 2020 and 336 did not (Table 2). Of the 121 companies that paid a dividend in 2020, 81 companies also paid a dividend in 2019 or 2018. The result showed that companies with a fixed dividend policy have not changed it as a result of a crisis such as the coronavirus pandemic. This was confirmed by the observations made by Mazur and others (2020) who showed that firms did not exhibit an increased propensity to cut dividends during the pandemic. As documented by DeAngelo and DeAngelo (1990) a high dividend cut occurs only when the company's losses are permanent (i.e. for at least three periods). However, if the company's losses are transitory then no such cut in dividend payments occurs. A different conclusion was reached by Krieger and others (2020), who showed that, as a result of the coronavirus pandemic, publicly traded companies in the United States sharply reduced the level of dividends paid or completely stopped paying dividends. Also Hauser (2013) indicated that the emergence of a crisis increases the likelihood of dividend cuts.

In addressing the negative effects of the coronavirus pandemic about 44% (199 companies out of the 457 surveyed) received state aid in 2020. At the same

Table 2. Descriptive statistics

Variable	SIZE	CASH	DEBT	ROA	AGE	GROWTH
All companies (457)						
Average	9.449	0.106	0.166	0.019	28.164	1.140
Median	9.233	0.055	0.148	0.028	21.000	1.070
S.D.	2.107	0.147	0.143	0.244	26.342	0.526
Dividend companies (121)						
Average	10.449	0.107	0.162	0.086	32.471	1.150
Median	10.341	0.068	0.148	0.057	26.000	1.108
S.D.	2.018	0.127	0.122	0.119	30.842	0.289
Dividend-cut companies (42)						
Average	10.920	0.082	0.152	0.070	40.071	1.085
Median	10.832	0.059	0.147	0.056	28.500	1.073
S.D.	2.117	0.067	0.129	0.060	40.839	0.120
Non-dividend companies (336)						
Average	9.088	0.106	0.168	-0.005	26.613	1.136
Median	8.956	0.050	0.147	0.015	20.000	1.054
S.D.	2.023	0.154	0.150	0.272	24.386	0.588
All companies with state aid (199)						
Average	8.479	0.121	0.139	-0.013	23.111	1.137
Median	8.388	0.057	0.106	0.018	19.000	1.066
S.D.	1.588	0.160	0.136	0.156	20.138	0.489
Dividend companies without state aid (95)						
Average	10.729	0.100	0.171	0.088	33.874	1.140
Median	10.523	0.055	0.151	0.056	27.000	1.108
S.D.	1.862	0.131	0.125	0.131	33.834	0.186
Dividend companies with state aid (26)						
Average	9.428	0.131	0.130	0.076	27.346	1.188
Median	9.155	0.105	0.118	0.058	23.000	1.104
S.D.	2.263	0.109	0.106	0.050	15.065	0.520

Note: In brackets the authors present number of companies.

Source: Own calculations based on data obtained from Orbis (n.d.).

time among the companies that paid dividends in 2020 there were only 26 that received state aid. These companies were from a variety of sectors, of varying sizes and with widely varying returns on total assets. It is also worth noting that 17 of these companies paid dividends regularly as the div_policy indicator in their case had the value equal to 1.

In general, the statistical analysis of the sample shows that on average companies that paid dividends in 2020 have higher market capitalization than companies that did not. The fact that dividend companies are bigger than companies that do not pay dividends has also been confirmed by Fama and French (2001), DeAngelo and others (2006) and Denis and Osobov (2008). Also dividend companies had a slightly higher cash balance, lower debt and a definitely higher return on assets in general. Dividend companies were older but what is surprising is that their growth opportunities were better than non-dividend companies. The results contradict the relevant literature where the relationship between dividend payment and growth opportunities is reversed. For example Fama and French (2001) noted that firms that have never paid dividends are those that have the best growth opportunities. The obtained results in that case can be explained by the dividend policy employed by companies. In the sample almost 41% of companies were those with stable pay-out policies.

Quite definitely the oldest group of companies were those that decided to decrease the level of dividend in 2020 in comparison to 2019. Overall, there were 42 companies that decided to cut dividends. These entities were also the largest but with the lowest growth opportunities and the lowest cash ratio.

The smallest companies belonging to the groups analysed were the ones that received state aid to counter the negative effects of the COVID-19 pandemic. These companies were also the youngest and they generated negative profitability in 2019. Companies that received state aid and paid dividends were of average size and age but they had the highest level of cash ratio and the lowest level of debt.

4.2. Results of estimating the logit probability model

The results obtained (Tables 3 and 4) revealed that for the analysed group of companies in model I there were four important variables when deciding to pay dividends, company state aid, debt, return on assets and dividend policy. The main explanatory variable—state aid granted to the companies in order to mitigate negative effects of COVID-19 pandemic had a negative impact which means that if the company received state-aid it was less likely to pay dividend. This is consistent with the authors' appriori expectations. To address the negative effects of the coronavirus pandemic state aid was provided to those entities whose financial condition has significantly deteriorated. As a result, these companies were more likely to stop paying dividends. By calculating an odds ratio, the result was obtained that the mean chance of dividend payment for

companies that received state aid was 0.41. It means that the chance of paying the dividends by companies that received state aid were, on average, lower by 59% in comparison to companies that did not receive aid.

The same ρ-value was received for dividend policy. However, in that case the sign was positive. If a company had paid dividends in previous years, it was much more likely to pay dividends in future years. A similar relationship was pointed out by Hauser (2013, p. 602): "about 95 percent of the probability of paying a dividend can be attributed to the prior dividend status", as well as DeAngelo and others (2006) and Lintner (1956) who stressed that managers are reluctant to stop paying dividends once they begin. These results were also consistent with the view of Ali (2021) who emphasized, that "firms will be more reluctant to decrease or cease dividends to avoid signalling bad news about future earnings". The decision about the dividend payment depended also on

Table 3. Logit analysis of dividend payment and dividend cut: results

	Model I	Model II
	dividend payment	dividend cut
const	−2.313*** (0.750)	−4.423*** (1.409)
state_aid_covid	−0.897*** (0.299)	0.004 (0.465)
size	0.110 (0.068)	0.188* (0.104)
cash	−1.023 (1.086)	−5.286** (2.398)
debt	−2.039* (1.050)	−3.642** (1.688)
ROA	0.850* (0.484)	0.750 (0.932)
age	−0.001 (0.005)	0.004 (0.006)
growth	0.104 (0.232)	−0.865 (1.009)
div_policy	2.352*** (0.273)	3.476*** (0.569)
McFadden R^2	0.275	0.350
Number of observations	457	457

Note: *, **, *** indicate significance at the 10%, 5% and 1% level, respectively. Standard errors are shown in parentheses.

Source: Based on data obtained from Orbis (n.d.).

the debt level, the higher the debt level, the lower the possibility of dividend payment. That is not a surprising result because "the risk associated with high degrees of financial leverage may result in low dividend payments because, *ceteris paribus,* firms need to maintain their internal cash flow to pay their obligations rather than distributing the cash to shareholders" (Al-Malkawi, 2007, p. 51). Similar views were presented by Brav et al. (2005) who proved that having extra funds from the dividend cut, the dividend-paying companies would use them to pay down debt. The last statistically significant variable in model I was ROA. The companies with higher profitability were more likely to pay a dividend. It was also confirmed by Ali (2021), Hauser (2013) and Jabbouri (2016).

The robustness tests (presented in the Appendix) confirmed the main result that the state aid variable was statistically significant and the coefficient was negative. In the applied OLS model other statistically significant variables were debt, ROA and dividend policy. Further robustness checks consisting of adding and removing variables from the model do not apply here because VIF (presented in the Appendix) is close to 1 which means that removing any variable will not change the sign of the parameter next to the state aid variable.

Table 4. Quality assessment of the probability model with the use of the optimal Cramer cut-off point

Probability of successful prediction in model I and model II			
dividend	0	1	probability of successful prediction
0	283	53	84.23%
1	40	81	66.94%
dividend cut	0	1	probability of successful prediction
0	335	80	80.72%
1	5	37	88.10%

Source: Own calculations.

Within the study population 42 companies decided to reduce their dividend in 2020 compared to 2019—that is about 35% of all companies that paid a dividend in 2020. Within those 42 companies 38 entities conducted a stable payout policy as they had paid a dividend in previous years. The analyses (Table 3) confirmed the significance of four variables, i.e., size, cash, debt and dividend policy. The state-aid variable was not statistically significant but the coefficient of direction next to the state-aid variable means that if the company received such aid, it was more likely to cut dividends (however, the impact was exiguous). It is coherent with what was obtained in the first model: that generally companies that received state-aid decided to reduce or cease dividend payment.

The companies that decided to cut dividend were relatively big and the size variable was statistically significant. The larger the company the more likely it was to cut dividends. This finding contradicts with what was found by Hauser (2013) who proved that the probability of a dividend cut decreases with a larger firm size. Results obtained in this research might be an effect of the experience of companies as those in the dividend-cut group were the oldest and not afraid of a dividend reduction. The model also showed that companies with better a cash ratio were less likely to cut dividend. Similar observations were described by Walkup (2016) who noticed that firms with high internal volatility are more likely to decrease their dividend. When deciding on a dividend cut companies also considered the level of debt. Surprisingly the higher the level, the lower the probability of a dividend cut. The last statistically significant variable was dividend policy with the highest ρ *value*. The coefficient of the direction was positive here as only companies that paid dividends in the previous year were able to reduce the level of payment.

The robustness tests (presented in the Appendix) confirmed the main result that the state aid variable was not statistically significant but the coefficient was positive. In the applied OLS model other statistically significant variables were cash ratio, debt and dividend policy.

Conclusions

The results obtained proved that state aid that companies were provided to address the negative effects of the coronavirus pandemic was a significant variable in the dividend payment model. The coefficient of direction associated with the variable was negative meaning that if the company received such assistance, it was less likely to pay a dividend.

An important limitation of this study is that only listed companies from one market were surveyed. Many means of assistance were targeted at small- and medium-sized enterprises meaning that listed companies were automatically excluded from the possibility of applying for some of the state aid. On the other hand, due to access to data connected with dividend payment it is impossible to broaden the sample with companies from the private market. There is also a limited possibility of adding other markets as state-aid data are not easily available. The authors aim to continue research with European markets as the European Commission is developing the database containing relevant information about public help granted to companies from the European Union in order to mitigate the negative effects of the coronavirus pandemic. By extending the research sample, it will be also possible to include in the model macroeconomic factors such as the country risk (political, economic, financial), institutional settings, investor protection and compare their impact on dividend

pay-out decisions between economies characterised by different structures and different levels of development.

State aid was necessary to maintain the satisfactory financial conditions of enterprises and jobs in the face of a pandemic crisis. It was not easy to prepare this aid so that entrepreneurs could use it as soon as possible and at the same time, make it adequate for the real effects that companies experienced as a result of the first wave of the pandemic. The fragmentation of these instruments and the chaos associated with their introduction and the subsequent improvement in later shields should be critically assessed. In this first year, many companies benefited from the aid which did not suffer the financial negative effects of the pandemic, but the conditions for granting the aid nonetheless enabled them to receive it. Enterprises using this type of aid should not spend their own resources on dividends but rather to lead the company out of crisis.

State aid implemented in Poland in 2021 compared to the previous year was more targeted—at enterprises from selected industries and those reporting a significant decrease in turnover. This already shows that the Polish government tried to more rationally direct aid to enterprises in financial difficulty due to the pandemic. Therefore, if a similar crisis occurs in the future the main task for policymakers will be to provide more directed and unambiguous aid for companies in order to avoid unproductive spending as well as to provide general rules that will restrict dividend payment for beneficiaries of any state-aid.

Appendix

Table A1. Correlation matrix

Variables	div	div_cut	state_aid_covid	size	cash	debt	ROA	age	growth	div_policy
div	1.000	0.530	−0.267	0.285	0.001	−0.016	0.164	0.098	0.012	0.533
div_cut	0.530	1.000	−0.127	0.222	−0.052	−0.032	0.067	0.144	−0.033	0.451
state_aid_covid	−0.267	−0.127	1.000	−0.405	0.086	−0.166	−0.113	−0.169	−0.006	−0.232
size	0.285	0.222	−0.405	1.000	−0.053	0.169	0.119	0.205	0.077	0.348
cash	0.001	−0.052	0.086	−0.053	1.000	−0.343	0.082	−0.062	0.047	0.035
debt	−0.016	−0.032	−0.166	0.169	−0.343	1.000	0.019	0.057	0.024	0.039
ROA	0.164	0.067	−0.113	0.119	0.082	0.019	1.000	0.008	0.001	0.156
age	0.098	0.144	−0.169	0.205	−0.062	0.057	0.008	1.000	−0.066	0.161
growth	0.012	−0.033	−0.006	0.077	0.047	0.024	0.001	−0.066	1.000	−0.015
div_policy	0.533	0.451	−0.232	0.348	0.035	0.039	0.156	0.161	−0.015	1.000

Note: The correlation was calculated with the Pearson coefficient.

Source: Own compilation.

Table A2. Variance Inflation Factors (VIF)

	state_aid_covid	size	cash	debt	ROA	age	growth	div_policy
value	1.241	1.355	1.154	1.174	1.043	1.072	1.018	1.182

Note: The VIF values presented in the table above are identical for model I and model II.

Source: Own compilation.

Table A3. Robustness tests—linear probability models with robust standard errors for dividend payment and dividend cut

	Model I dividend payment	Model II dividend cut
const	0.088 (0.102)	−0.039 (0.071)
state_aid_covid	−0.118*** (0.039)	0.003 (0.027)
size	0.015 (0.010)	0.011 (0.007)
cash	−0.107 (0.125)	−0.178** (0.088)
debt	−0.253* (0.130)	−0.190** (0.091)
ROA	0.130* (0.072)	0.002 (0.050)
age	−0.000 (0.001)	0.001 (0.000)
growth	0.013 (0.033)	−0.012 (0.023)
div_policy	0.468*** (0.042)	0.273 (0.029)
R^2	0.320	0.224
Number of observations	457	457

Note: *, **, *** indicate significance at the 10%, 5% and 1% level, respectively. Standard errors are shown in parentheses.

Source: Own compilation.

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