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Catering to investor sentiment for dividends: contestability or collusion of the largest shareholders?

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Keywords: *dividend payout; the catering effect of dividends; contestability & collusion of the largest shareholders; investor sentiment for dividends*

Abstract

Research background: Dividend payouts have been the subject of scientific research for many years. Although many studies focus on the impact of ownership on dividend payouts, there is still a lack of research on the influence of the contestability and collusion of the largest shareholders on the catering effect of dividends. This research gap motivated us to investigate this issue and determine whether the interactions between large shareholders have an impact on aligning dividends with investor sentiment.
Purpose of the article: The article assesses the impact of the relationship between the largest shareholders (i.e., contestability or collusion) on the adjustment of dividend payouts to investor sentiment. The following research hypothesis has been formulated: If there is contestability between the first and second-largest shareholders, the strength of the catering effect of the dividend is greater than in the case of collusion, both in the years of positive and negative dividend premiums.
Methods: The main research method is a panel regression model (pooled OLS and fixed effects). We use the F test, the Breusch-Pagan test, and the Hausman test. Our research is supplemented with descriptive statistics and the Pearson correlation coefficient. The research sample consists of Polish companies from the electromechanical industry sector listed on the main market of the Warsaw Stock Exchange (WSE) in the years 2009–2020.
Findings & value added: The main findings are as follows: a) if a dividend premium is positive and the second-largest shareholder holds many shares, the strong catering effect of dividends is observed; b) there are only two years of negative premium, which does not allow to conclude that both the catering effect and the impact of interactions between the largest shareholders on divi-

dend payouts do not exist when dividend premium is negative. We propose pioneering research concerning the catering effect in the context of interactions between the largest shareholders. Its long-term theoretical value added is the original and interdisciplinary research combining financial, behavioral and governance aspects. Our research results may be of particular interest to foreign investors looking for new opportunities to invest their capital abroad, also in Poland.

Introduction

The dividend policy is one of the most frequently investigated issues in the field of corporate finance. Since the 1950s, when Lintner (1956, pp. 97–113) published his research on dividends, the dividend puzzle has still not been solved. When finding an answer to the question of why companies pay out dividends, researchers focus on the determinants and implications of payout. A relatively new line of research is related to dividends in the context of behavioral finance, in particular, to the catering theory of dividends (Takmaz *et al.*, 2021, pp. 897–914; ElBannan, 2020, pp. 350–373; Gyimah & Gyapong, 2021, pp. 1–18; Byun *et al.*, 2021, pp. 1–15). This theory, proposed by Baker and Wurgler (2004, p. 1125), assumes that stock investors behave irrationally (i.e., they make investment decisions based only on dividends), while managers' behavior is rational (i.e., they analyze the market and pay out dividends if dividend payers are valued higher than non-payers). This adjustment of dividend payouts to investor sentiment for the dividend is called the catering effect. The catering theory of dividends has been developed by several authors. Li and Lie (2006, p. 293) demonstrated that dividends increase in years of high dividend premiums. Jiang *et al.* (2013, p. 36) showed that stock investors prefer share buy-backs to dividends when the repurchase premium is positive. Lin *at al*. (2018, p. 2433) proved that the effects of information asymmetry dominate over those of catering incentives for the board to decide about dividend policy. Byun *et al.* (2021, p. 1) focused on the legal systems and proved that companies from countries with strong legal protections for investors are more likely to cater to investors. The study by Gyimah and Gyapong (2021, p. 8) showed that catering effects weaken the negative impact of managerial entrenchment on dividend, and companies respond to catering incentives when they are dominated by insiders. Neves (2014, p. 35) concentrated on the contestability and collusion between large shareholders of western European companies and proved that they influence the catering to investor sentiment for dividends. To the best of the author's knowledge, there are no studies on the impact of interactions between large shareholders on the catering effect of dividend in CEE markets. Therefore, the research gap should be filled.

The observed research gap motivated us to investigate whether the contestability and collusion of large shareholders have an influence on aligning dividends with investor preferences. It is worth adding that if the activities of the first-largest shareholder are monitored by non-dominant large shareholders to prevent wealth expropriation, this interaction between them is called contestability (Jara *et al.*, 2019, p. 259). Conversely, if the largest shareholders collaborate with one another to increase the efficiency of private benefits extraction, this coalition is named collusion (Maury & Pajuste, 2004, p. 1814; López-Iturriaga *et al.*, 2015, p. 519). Therefore, the goal of this paper is to assess the impact of the relationship between the largest shareholders (i.e., contestability or collusion) on the adjustment of dividend payouts to investor sentiment. Understanding the impact of shareholders' contestability and collusion on adjusting the dividends to investor sentiment is vital both for a stock investor who wants to receive regular dividends, and for a listed company that, through an appropriately implemented dividend policy, can affect its market value. The main method of our research is a panel regression model. To choose the appropriate one, we use the F test, the Breusch-Pagan test, and the Hausman test. The research was conducted using Polish companies, but in spite of the limited research our study has been, so far, the only one in CEE countries, which allow the readers to compare the findings with that from the Eurozone countries (Neves, 2014, p. 35).

The remainder of this article is structured as follows. Part 2 presents the literature review. Part 3 describes the research methodology. Part 4 presents and discusses the research results. Part 5 highlights the conclusions. The last part contains the annex.

Literature review

Among the research on dividends, an important place is occupied by those studies that concern the ownership structure, understood both in terms of ownership concentration and shareholder type. The literature emphasizes that concentrated ownership is the domain of companies from Continental Europe (Anidjar, 2019, p. 197), developing economies (mainly in Asia, South America, and the Middle East), and countries after transformation (Moscu *et al.*, 2015, p. 194; Aluchna *et al.*, 2019, p. 230). In contrast, dispersed ownership is observed in the UK and the USA (Armour *et al.*, 2003, p. 1699; Becht & Delong, 2005, p. 613). The indicated differentiation of ownership concentration, characteristic both in terms of the economic situation and the development of the capital market, as well as the legal system

of a given country, influences the implementation of company's strategy, and consequently its market value (Jentsch, 2019, p. 203). It is argued that in civil-law countries characterized by concentrated ownership, less frequent and lower dividend payouts are observed than in common-law countries, in which ownership is dispersed (compare Ferris *et al.*, 2009, p. 496).

The research results presented in the literature mainly concern the influence of ownership concentration on dividend payouts. The strength and direction of this correlation depend on, among others, the type of the largest shareholder. In the case of managerial ownership, the results are ambiguous. Truong and Heaney (2007, p. 667) investigated companies from 37 countries and found that companies pay out higher dividends in the case of higher profitability, lower debt, limited investment opportunities, and when the largest shareholder is not a manager. Kim *et al*. (2020) found an inverse U-shaped relationship between managerial ownership and dividend payouts in eleven Asian countries. Florackis *et al*. (2015, p. 783) investigated companies listed on the NYSE, AMEX, and NASDAQ exchanges and demonstrated that if the managerial share in the ownership structure is relatively low, there is a negative relationship between managerial ownership and dividends. However, this negative correlation becomes positive at high levels of insider ownership.

Neves (2014, p. 46) studied nine European countries and argued that at lower levels of managerial ownership, the alignment of interest between insiders and outsiders is observed. In this case, dividend payouts are paid to mitigate agency conflict. However, if managerial ownership is strongly concentrated, a dividend decrease is observed. This non-monotonic relationship can result from managerial entrenchment (compare Bilel, 2020, p. 275) and benefiting from control at the expense of minority shareholders. Furthermore, if the main shareholder is the state treasury or an institutional investor, including, in particular, a foreign investor, dividend payouts increase due to their large capital needs (Baker & Jabbouri, 2017, p. 1332; Baker *et al.*, 2018, p. 324; Khalfan & Wendt, 2020, p. 13).

Ownership concentration is also associated with control concentration and its impact on dividend policy. In insider systems, ownership and control are concentrated, so dividends are lower than in outsider systems due to the large shareholders who expropriate minority shareholders. This expropriation is especially observed in Continental Europe, where the legal protection of minority shareholders is low (Renneboog & Szilagyi, 2020, p. 3). According to the entrenchment hypothesis (Aluchna *et al.*, 2019, p. 230) and expropriation hypothesis (Neves, 2014, p. 36), ownership concentration, which is characteristic of insider systems, may lead to private benefits of control being realized at the expense of minority shareholders. This rent

extraction by large shareholders is possible, *inter alia*, by control leverage (i.e., tunneling, self-dealing and pyramidal structures). As Gugler & Yurtoglu (2003, p. 731) demonstrated, deviations from the one-share-one-vote rule due to pyramidal structures result in lower dividend payouts of German companies. Similar results for Chinese companies under corporate pyramids were presented by Bradford *et al.* (2013, p. 445), who showed the negative correlation between the length of the control chain and dividends.

As indicated in the literature, non-controlling large shareholders (in particular, the second-largest shareholder) are responsible for limiting wealth expropriation and rent extraction. They also strive to achieve minority shareholder goals (Cheng *et al.*, 2020, p. 20), in particular, dividend payouts (Neves, 2014, p. 42; Aluchna *et al.*, 2019, p. 231). Therefore, one of the tasks of large shareholders is to monitor both the managers and the first-largest shareholder in order to reduce agency costs. This monitoring of managers, which is related to the principal-agent conflict that arises from differences in managers' and shareholders' priorities (see Jensen & Meckling, 1976), solves the free-riding problem. It means that agency costs decrease due to the lower investments in low-return projects. As a result, more funds can be paid out as dividends.

Furthermore, the presence of large shareholders causes a principal-principal conflict. This type of agency conflict is dual in nature. First of all, it is observed between the controlling owner and minority shareholders. It has been demonstrated that controlling owners cause agency problems due to wealth expropriation. They extract rent and private benefits at the expense of minority shareholders, and as a result, the principal–principal conflict restrains dividend payouts (Harada & Nguyen, 2011, p. 362).

However, the multiple large shareholders may monitor the largest owner (i.e., the controlling shareholder) to reduce this extraction (Maury & Pajuste, 2004, p. 1814). Their presence reduces private benefits by competing for control (Bloch & Hege, 2003). Such interactions between the largest shareholders indicate the second type of principal-principal agency conflict, which is the conflict between the largest shareholders.

The literature presents diverse research concerning the influence that the contestability and collusion of the largest shareholders have on various aspects of a company's activities and performance. Jara *et al*. (2019, p. 259) investigated non-financial companies from Latin America and confirmed that if contestability increases, the financial performance of companies is enhanced. In particular, their results support the relevance of contestability on a company's value. Moreover, they proved that contestability has a greater influence on the results of family companies since their ownership structure is strongly concentrated. Their findings are in line with

those of Maury and Pajuste (2004, p. 1814), who investigated Finnish listed companies and showed that a more equal distribution of votes among large shareholders results in an increase of the company's value. They demonstrated that observed dependence is stronger in family-controlled companies, suggesting that families are prone to extract private benefits of control. Additionally, shareholder coalitions affect productivity.

Boubaker *et al.* (2021, p. 591) investigated French listed companies and found a negative correlation between the excess control of dominant owners and firm productive efficiency. However, multiple large shareholders neutralize the effect of excess control. Ben-Nasr *et al.* (2015, p. 265) argued that controlling shareholders prefer long-maturity debt to short-maturity debt to avoid frequent monitoring by lenders. However, the existence of non-controlling large shareholders reduces that preference through the use of longer-maturity debt. Furthermore, Cao *et al.* (2019, p. 287) showed that the more shares that are held by the controlling shareholders, the poorer the quality of the CSR reporting. This is mitigated by the non-controlling large shareholders.

The contestability and collusion of shareholders are also examined in terms of dividends. Jiang *et al.* (2019, p. 17) found that Chinese companies with multiple large shareholders are more likely to pay out dividends. The propensity to pay a dividend increases if the largest shareholder cooperates with others. Ramli (2009, p. 97) demonstrated that the presence of a substantial second-largest shareholder has a positive impact on the dividend payout of Malaysian companies. López-Iturriaga *et al.* (2015, p. 519) also showed that coalitions of shareholders in Spanish companies affect payout policy negatively. Furthermore, Rossi *et al.* (2018, p. 531) proved that contestability dampens the expropriation of benefits to Italian minority shareholders.

It is worth noting that very little research has investigated the impact of shareholder interactions on the catering effect of dividends. So far, research has focused mainly on the relationship between managerial ownership and the catering effect. Gyimah and Gyapong (2021) examined US companies and found evidence that managerial entrenchment negatively impacts dividend payments, and the dividend is paid when there is external investor demand for payouts. Pieloch-Babiarz (2020, p. 467) showed that in Polish companies, the catering effect of the dividend weakens if the manager is the largest shareholder. Neves (2014, p. 35) also found that concentrated managerial ownership negatively affects the catering effect. Moreover, she demonstrated that the second-largest shareholder moderates the extent to which firms cater to investor sentiment. Finally, she showed that contesta-

bility and collusion between large shareholders influence the catering to investor sentiment for a dividend.

The study carried out by Neves has been, so far, the only investigation that recognizes the problem raised in this article. The author conduced the research using data from nine Eurozone countries and for each country an unbalanced panel of non-financial companies was used. The study covered 487 companies in years 1990–2003 (Neves, 2014, p. 44–45). Our study complements that by Neves by extending it to Polish companies and is the first study in this area in the CEE countries.

Research method

The research was conducted on companies from the electromechanical industry sector (i.e., electro machinery, industrial machinery, metals products, farm and heavy trucks, other — machinery). The following companies were included in the research sample: Apator, Aplisens, Bumech, Famur, Fasing, Feerum, Hydrotor, Introl, Lena Lighting, Mangata, Moj, Patentus, Primetech, Rafamet, Rawlplug, Redwood, Relpol, Sonel, Sunex, Ursus, VigoSys, Warwick, Wielton, Zamet Industry, ZPUE, ZUK Stąporków and Zremb Chojnice. For the research, we qualified the companies listed on the main market of the Warsaw Stock Exchange (WSE) in the years 2009–2020. The adopted research period was selected to include both the period after the Global Financial Crisis of 2007–2009 when the stock markets has been growing quite dynamically, as well as the first year of Covid-19 pandemic when the low interest rates make dividends compensate some investors for lost opportunities to profit from other kinds of investment. Our focus on the electromecanical industry sector stems from the specificity of its dividend policy (long-term and regular payouts), which allowed us to conduct a longitudinal study. Furthermore, focusing on one sector allowed us to avoid the issue of sample heterogeneity when assessing the impact of contestability and collusion between the largest shareholders on adjusting payouts to investors' sentiments for the dividend. Moreover, the decision to choose the electromecanical industry sector for the research was made on the basis of an analysis of the ownership structure of companies. Carrying out the research on this sector may be considered a limitation. However, the findings can be of great interest for international investors who, due to the deteriorating economic situation, are looking for new possibilities of investing their capital, also abroad. Emerging capital markets from the CEE countries characterized, among others, by a relatively smaller number of companies, are not as thoroughly researched as developed capital markets,

so any research results concerning them are both an important contribution to the theory of economics and the value added for international investors.

According to the EMIS database, at the end of 2020 only one of the surveyed companies (i.e. Rafamet SA) was controlled by the State Treasury. Due to such a small number of state-controlled companies in the electromechanical industry sector, we decided not to include the binary variable (being a proxy for the control of the State Treasury) in the proposed models. In addition, the first-largest shareholder in the surveyed sector was a natural person (57.7% of companies, including a manager — 22.2%), a legal person (22.2%) and an institutional investor (14.8%). The second-largest shareholder was a natural person (48.1%, including a manager — 11.1%), an institutional investor (25.9%) and a legal person (11.1%). To get the final research sample, we conducted pairwise deletion of missing data[1] and received 324 firm-year observations.

Based on the literature presented in the theoretical part of the paper, in particular, taking into account the monitoring hypothesis and expropriation hypothesis, we assumed that the strength of the catering effect depends on whether there is contestability or collusion between the first and second-largest shareholders. Therefore, the research hypothesis is:

H: *If there is contestability between the first and second-largest shareholders, the strength of the catering effect of the dividend is greater than in the case of collusion, both in the years of positive and negative dividend premiums.*

The dvidend premium is understood as the difference between the average price-to-book ratio of dividend payers and non-payers (Baker & Wurgler, 2004, pp. 1125–1165). In the research sample the premium was positive in 2009–2018 and equal to 0.79, 0.44, 0.34, 0.46, 0.31, 0.26, 0.61, 0.79, 0.28, 0.91 (respectively) and negative in 2019-2020 (i.e. -0.94 and -0.05, respectively).

The impact of contestability and collusion between the largest shareholders on the strength of the catering effect of dividends was investigated using the pool OLS (for the years of negative premium) and fixed effects model (for the years of positive premium). The decision to use the above models instead of the random effects model was made based on results of the F-test, the Breusch-Pagan test, and the Hausman test (Hsiao, 2003, p. 174).

[1] Due to missing data, we had to exculde 2 out of 29 companies, i.e. APS Energia and JWW Invest.

In order to study the interactions between the owners and to investigate the existence of the catering effect in the context of contestability and collusion between the first and second-largest shareholders in the years of positive and negative dividend premium, we propose estimating two models given in two versions (i.e., a and b). Model 1 is represented by the following equation:

$$\begin{aligned} Dividend_{i,t} &= \gamma_0 + Cater_{i,t-2}(\gamma_1 + \omega_1 Collusion1_{i,t-1}) + \\ &+ \gamma_2 Return_{i,t-1} + \gamma_3 Size_{i,t-1} + \gamma_4 Leverage_{i,t-1} + \gamma_5 Years_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where: $Dividend_{i,t}$ is the dividend payout ratio of the *i*-th company in year *t* computed as total dividend over net earnings; $Cater_{i,t-2}$ is a proxy for the catering effect which requires the dividend premium to be computed; $Collusion1_{i,t-1}$ is a proxy for collusion/contestability, computed as the number of shares held by the second-largest shareholder over the number of shares held by the first-largest shareholder, i.e., *P2/P1* (Jara *et al.*, 2019, p. 261). It is a dummy variable that takes a value of 1 if the relationship between the number of shares held by the second-largest shareholder and the number of shares held by the first-largest shareholder is at least equal to the mean, i.e. the average value of the *P2/P1* in the tested sample (model 1a) or to the third quartile of the *P2/P1* in the tested sample (model 1b), i.e., *P2/P1* > *Mean* or *P2/P1* > *Q3*, respectively (collusion), and 0 otherwise (contestability). The adoption of such assumptions results from the need to include in the study not the nominal but the relative number of shares of the largest shareholders to show the real opportunity for the second-largest shareholder to monitor the first-largest. If the difference in the number of shares held by the largest shareholders is small, making decisions requires an agreement (or collusion) between them. In this way, the coefficient of the catering variable is γ_1 for companies in which there is contestability between the largest shareholders (since *Collusion1* takes value 0), and $\gamma_1+\omega_1$ otherwise. Coefficient γ_1 is expected to be positive and statistically significant (according to the monitoring hypothesis, we assume that contestability between shareholders leads to the goals of minority shareholders being achieved and investor sentiment for dividends being catered to). Coefficient $\gamma_1+\omega_1$ is expected to be positive and statistically significant, however lower than γ_1 (in accordance with the expropriation hypothesis, we assume that collusion between the owners leads to rent extraction rather than catering to investor sentiment for dividends).

If the coefficients of the dummy variables are statistically significant, a linear restriction test is needed (null hypothesis H_0: $\gamma_1+\omega_1 = 0$); control

variables: $Return_{i,t-1}$ is the return on assets of the *i*-th company in year *t-1*; $Size_{i,t-1}$ is the size of the *i*-th company in year *t-1* computed as a natural logarithm of total assets; $Leverage_{i,t-1}$ is the debt ratio of the *i*-th company in year *t-1*; $Years_{i,t-1}$ is the age of the *i*-th company in year *t-1*. The coefficients at *Return*, *Size* and *Years* are expected to be positive, while the coefficient at *Leverage* is expected to be negative and statistically significant at adopted significance levels; $\varepsilon_{i,t}$ is a random component.

Alternatively, in order to verify the research hypothesis, model 2 is given by the following regression:

$$\begin{aligned} Dividend_{i,t} &= \gamma_0 + Cater_{i,t-2}(\gamma_1 + \theta_1 Collusion2_{i,t-1}) + \\ &+ \gamma_2 Return_{i,t-1} + \gamma_3 Size_{i,t-1} + \gamma_4 Leverage_{i,t-1} + \gamma_5 Years_{i,t-1} + \varepsilon_{i,t} \end{aligned} \tag{2}$$

where: $Collusion2_{i,t-1}$ is a proxy for collusion/contestability, computed as the difference between the number of shares held by the largest shareholders squared, i.e., $(P1–P2)^2$ (Jara *et al.*, 2019, p. 261). It is a dummy variable that takes a value of 1 if this difference is lower than the mean, i.e. the average value of the *P2/P1* in the tested sample (model 2a) or first quartile of the *P2/P1* in the tested sample (model 2b), i.e. $(P1–P2)^2 < Mean$ or $(P1–P2)^2 < Q1$, respectively (collusion), and 0 otherwise (contestability). As previously, we assume that if the difference in the number of shares held by the largest shareholders is small, making decisions requires an agreement (collusion) between them. In this way, the coefficient of the catering variable is γ_1 for companies in which there is contestability between the largest shareholders (since *Collusion2* takes a value of 0), and $\gamma_1+\theta_1$ otherwise. Coefficient γ_1 is expected to be positive and statistically significant, while $\gamma_1+\theta_1$ should be positive and statistically significant, although lower than γ_1 (we assume that collusion between the owners leads to rent extraction rather than catering to investor's sentiment for dividend). As previously, if the coefficients of the dummy variables are significant, a linear restriction test is needed; the other designations as above.

Our analysis is enriched with the research results based on descriptive statistics and the Pearson correlation coefficient.

All financial data were obtained from the Notoria Service database, market data were retrieved from Stock Market Yearbooks, the number of shares of the first and second-largest shareholders was hand-collected from the companies reports at their websites, while age was obtained from the National Court Register. The empirical research was conducted using Statistica and Gretl software.

Results and discussion

Table 1 presents the descriptive statistics of the independent, dependent, and control variables for 324 firm-year observations. The mean dividend payout ratio is at 0.30, which means that the electromechanical industrial companies pay out, on average, 30% of net earnings. Moreover, in one-fourth of the analyzed cases, the dividend payout ratio is at least 50%. The average dividend premium is positive (0.35), which means that in this sector, the average price-to-book value ratio of dividend payers is higher than that of non-payers. Furthermore, the mean of *Collusion1* is 0.45; thus, the second-largest shareholder owns an average of 45% of the shares held by the first-largest shareholder. Focusing on the control variables, it should be noted that the studied companies are profitable (average *Return* is 4%), medium-large (average *Size* is 11.9), not excessively indebted (average *Leverage* is 36%), and the average number of listing years is 11.

The analysis of descriptive statistics broken down into the years of positive (i.e. 2009–2018) and negative (i.e. 2019–2020) dividend premium provides interesting findings. One can notice that the average *Dividend* is higher for negative premium years (48%) than positive ones (27%). These results are in line with our expectations, as this ratio does not show the total dividend paid, but the share of dividend in net earnings. In the years of a negative dividend premium, the profitability of companies is lower, which is supported by the average value of *Return* (in positive premium years, it is 6%, while in negative ones, it is -3%). Therefore, the results do not mean that in years of negative premium the total dividend is higher, only that it constitutes a larger part of lower net earnings. Our findings are consistent with the literature, which indicates that according to the signaling hypothesis, companies use dividends as a tool to inform stakeholders about good financial standing (Wrońska-Bukalska & Kaźmierska-Jóźwiak, 2017, p. 247). Dividend reduction or, worse, the cessation/omission of payments may negatively affect the company's market value (Michaely *et al.*, 1995, p. 573; Kraiger & Anderson, 2019, p. 40). Therefore, companies smooth out dividends (Leary & Michaely, 2011, p. 3187) and slowly adjust them to net earnings changes. It should be added that a negative dividend premium was observed only in the last two years of analysis, including 2020, when economic indicators deteriorated. Our results confirm those by Kowerski (2010, p. 19), who showed that in the years of poor macroeconomic conditions, dividends are limited.

Regarding the interactions between the largest shareholders, one can notice that if the dividend premium is positive, the second-largest shareholder holds relatively more shares (average *Collusion1* is 48%, *Collusion2* is

1162.84) than in the case of a negative premium (36% and 1876.06, respectively). This may indicate that in the years of the higher market valuation of non-payers, the ownership concentration increases. As a result, the second-largest shareholder has less ability to control the largest shareholder in terms of achieving the goals of minority shareholders, including dividend payouts. Furthermore, in the years of negative dividend premium, we observed: a) debt reduction (debt is 33% of total assets), which — according to the literature – enables the company to transfer a greater part of net earnings in the form of a dividend (Jensen *et al.*, 1992, p. 247); b) total assets reduction (*Size* is 11.88). In addition, the higher values of *Years* in the years of negative premium results from the fact that *Cater* < 0 is observed in the last years of our research, so the analyzed companies are older. The obtained results are in line with those of Baker *et al.* (2019, p. 2), Trabelsi (2019, p. 102), ElBannan (2020, p. 350) and Agrawal (2021, p. 9).

The coefficients of pairwise correlation between the variables are given in Table 2. In the case of a positive premium, there is a significant correlation between the dependent variable and all explanatory variables. The highest and most statistically significant correlation is observed for *Dividend* and *Cater* ($r_{yx} = 0.70$), which indicates that dividend payouts are adjusted to investor sentiment. This finding is consistent with that by Takmaz *et al.* (2021, p. 897). There is a positive and statistically significant correlation between *Dividend* and the explanatory variables used to determine the catering effect in the case of interactions between the main shareholders. The Pearson correlation coefficient (which ranges from 0.39 to 0.55) indicates the positive relationship between the number of shares held by the second-largest shareholder and dividend payouts. Our result is in line with that by Jiang *et al.* (2019, p. 17). Furthermore, a positive and statistically significant correlation is observed between *Dividend* and three control variables (*Return*, *Size,* and *Years*), while a negative correlation occurs for *Leverage* ($r_{yx} = –0.32$). The obtained results are in line with those by Baker *et al.* (2019, p. 2), ElBannan (2020, p. 350) and Agrawal (2021, p. 9). In turn, in the case of a negative premium, the Pearson correlation coefficients computed for *Dividend* and the explanatory variables are not statistically significant, except for *Size* ($r_{yx} = –0.03$). It is worth to add that the explanatory variables were chosen so that the Pearson correlation coefficient does not exceed |0.7|. The strongest correlations shown in Table 2 (i.e., r_{yx} higher than |0.7|) are observed between the explanatory variables used in different models. The results presented in the correlation matrix indicate that the variables can be used in the proposed models (see Fooladi, 2012, pp. 691–692).

In Table 3, we present the estimation results of eight models used to test the strength of the catering effect depending on whether there is contestability or collusion between the first and second-largest shareholders. Focusing first on four models that relate to the periods with a positive dividend premium, it should be noted that the coefficient at *Cater* is positive and statistically significant ($\alpha = 0.05$). Our findings confirm that studied companies cater to investor sentiment for dividends, which means that managers analyze market reactions and investor preferences to pay out dividends if that payment is expected. Our results are in line with the findings of Takmaz *et al.* (2021, pp. 897–914), ElBannan (2020, pp. 350–373), Gyimah and Gyapong (2021, pp. 1–18) and Byun *et al.* (2021, pp. 1–15) but inconsistent with these of Eije and Megginson (2008, p. 347) or Tsuji (2010, p. 14). This discrepancy is due to the fact these authors conducted their research without considering the homogeneity of companies from different sectors, the studies were carried out in various research periods, and the methodology of the dividend premium was different.

Model 1a, estimated for a positive dividend premium, allows us to analyze the strength of the catering effect depending on the interactions between the main shareholders. The respective coefficient at *CaterCollusion1* (ω_1=–0.137) proved not to be statistically significant at the accepted levels of significance. Thus, if the dividend premium is positive and the relationship between the share of the second and first-largest shareholders is, at least, average, our hypothesis is not supported. However, if the second-largest shareholder holds more shares (i.e., *P2/P1* > *Q3*), the coefficient at *CaterCollusion1* is positive and significant at 10% (ω_1=0.167), and $\gamma_1+\omega_1$ is, contrary to our assumptions, positive and higher than γ_1 (i.e., $\gamma_1+\omega_1$ = 0.954). This result means that if the second-largest shareholder holds more shares, the catering effect is stronger. This may indicate that there is no collusion in the analyzed companies, and the second-largest shareholder monitors the activities of the first-largest shareholder in order to achieve the goals of minority shareholders. Furthermore, the research carried out for positive premium using model 2 (a and b) provides similar findings. If $(P1–P2)^2$ < *Mean*, the parameter at *CaterCollusion2* (θ_1=–0.126) is not statistically significant. However, if the share of the second-largest shareholder is higher (i.e., $(P1–P2)^2$ < *Q1*), this parameter is positive (θ_1=0.175) and statistically significant at 10%. Moreover, the parameter $\gamma_1+\theta_1$ is positive and higher than γ_1 (i.e., $\gamma_1+\theta_1$ = 0.958), so if the second-largest shareholder holds many shares, the strong catering effect is observed. This may mean that the largest owners do not collude, and the second-largest shareholder monitors the first-largest owner to adjust the payouts to investor sentiment for dividends. The results are in line with these of Jiang *et al.* (2019, p. 17)

who found that companies are more likely to pay out dividends if the largest shareholder is monitored by other shareholders. Our results are also in line with the findings by Neves (2014, p. 49). She demonstrated that contestability (collusion) between the largest shareholders has a positive (negative) impact on the catering effect of dividends. Furthermore, received results are consistent with the results of Gugler and Yurtoglu (2003, p. 731). They showed that larger holdings of the first-largest shareholder lead to a reduction in dividends, while larger holdings of the second-largest shareholder lead to higher dividend payouts. In turn, Safii and Asyik (2019, p. 454) showed that the concentration of shares by large shareholders has a negative influence on the dividend amount.

When estimating results in the case of a negative dividend premium, it should be noted that in each model, the value of parameter at *Cater* is negative but not significant, so the catering effect is not observed. Furthermore, the parameters at *CaterCollusion1* and *CaterCollusion2* are not significant either. Thus, the hypothesis is not supported for the years of negative premiums. It is worth emphasizing that, according to the author's knowledge, the conducted research is the first one in which the models are estimated separately for the years of positive and negative premium.

Conclusions

The paper shows the results of novel research into the catering theory of dividends concerning the impact of interactions between major shareholders on adjusting the dividend payout to investor sentiment. In order to verify the hypothesis, we conduct a study on listed companies from the electromechanical industry sector, dividing the research period into the years of positive and negative dividend premiums. There are four main conclusions.

First, in the Polish electromechanical industry sector, the dividend premium is positive in most years (i.e. 2009–2018). Second, if the dividend premium is positive, the analyzed companies cater to investor sentiment for dividends (in the years of positive dividend premium the coefficient at *Cater* is positive and statistically significant in all models), which means that managers analyze stock market reactions to decide about dividends. Furthermore, if the second-largest shareholder holds many shares, the strong catering effect of dividends is observed (model 1b and 2b). This indicates that the interactions between the largest shareholders should be seen as contestability (strong monitoring and control of the first-largest shareholder enable the objectives of minority shareholders to be achieved). Third, on the Polish stock market the second-largest shareholder holds many shares if

the value of the ratios referring to the relative number of their shares is compared to the appropriate quartiles (i.e. $P2/P1 > Q3$ or $(P1–P2)^2 < Q1$), not to the mean. In conclusion, if the dividend premium is positive and the second-largest shareholder holds many shares, the research hypothesis is not supported. Fourth, in the years of negative dividend premium, the research hypothesis is not supported. However, there are only two years of negative premium, which does not allow to conclude that both the catering effect and the impact of interactions between the largest shareholders on dividend payouts do not exist when dividend premium is negative.

The presented conclusions may be especially useful for stock investors. The low interest rates and high inflation in Poland encourage investors to seek profitable investments. Therefore, the interest in dividend investing is increasing. It has been proven that when making decisions about dividend investing stock investors should also take into account the interactions between the largest shareholders. Expecting to meet investors' needs as to the amount of dividends, stock investors should invest in the shares of those companies in which the second-largest shareholder holds many shares, i.e. they monitor the activities of the largest shareholder and guarantee the achievement of the goals of minority shareholders. Moreover, the received findings may also be valuable for managers. The implementation of stock investors' goals in the form of a dividend will probably result in an increase in the company's market value. In addition, the results may also be useful for the governance bodies that are responsible for institutional reforms of the financial markets. Knowing the impact of interactions between the largest shareholders on the catering effect, depending on the number of shares the owners hold, it is worth starting a merit discussion on the implementation of some new legal regulations and ways of controlling these interactions by governance bodies in order to strengthen the protection of minority shareholders' interests. First of all, it is about systemic solutions limiting the collusion and its negative impact on the possibility of participation of the minority shareholders in the net earnings. The discussion on whether and why it is necessary to introduce institutional reforms in this area should take place on the international arena, in order to develop the coherent system solutions in the era of market globalization and liberalization of investment capital flows.

The results cannot be generalized due to some limitations. First, our study covers only one sector on the WSE. Second, in the adopted period, there are only two years of negative premium, which does not allow us to conclusively state that the catering effect does not occur then. Third, we only considered the number of shares, without control leverage or pyramid structures. Fourth, the research was conducted at the beginning of the

Covid-19 pandemic and does not take into account the market situation during the pandemic, nor in the years after it. Due to the pandemic situation and low interest rates, market investors are looking for various ways of profit taking, including by purchasing dividend shares. When they buy such stocks, they expect regular dividend payouts. However, this situation raises several questions: 1) will a stronger catering effect be observed along with growing investors' expectations regarding dividends? 2) will contestability still be observed? 3) will monitoring conducted by the second-largest shareholder during and after the pandemic weaken? In the author's opinion, it seems that after the pandemic, the interactions between the largest shareholders may change due to the new market situation. It is, therefore, possible that the second-largest shareholder will no longer support the benefits of minority investors in the form of dividends, and together with the first-largest shareholder will try to leave the profit in the company for the development or changing the business profile. As a result, it is possible that the catering effect will diminish or disappear in the coming years.

Therefore, further research on this issue is required. As the study should be considered preliminary, we recommend: a) extending the research period and repeating the study in a few years after the Covid-19 pandemic; b) considering other sectors and capital markets; c) examining the combined effect of interactions between the owners if the first-largest shareholder is a controlling shareholder; d) taking into account different types of the second-largest shareholder (institutional shareholder, manager, etc.).

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Annex

Table 1. Descriptive statistics

Specification	Mean	Std. Dev.	Q1	Median	Q3
Panel A: All observations (N=324)					
Dividend	0.30	0.69	0.00	0.00	0.50
Cater	0.35	0.47	0.28	0.39	0.66
Collusion1	0.45	0.33	0.15	0.42	0.72
Collusion2	1298.93	1747.66	20.39	441.00	2293.71
Return	0.04	0.13	0.01	0.05	0.09
Size	11.90	1.02	11.35	11.81	12.52
Leverage	0.36	0.20	0.21	0.35	0.50
Years	11.02	4.42	8.00	11.00	14.00
Panel B: Positive dividend premium (N=270)					
Dividend	0.27	0.34	0.00	0.00	0.51
Cater	0.52	0.23	0.32	0.45	0.75
Collusion1	0.48	0.33	0.17	0.45	0.79
Collusion2	1162.84	1633.55	16.00	364.81	2275.29
Return	0.06	0.06	0.01	0.05	0.09
Size	11.91	0.98	11.34	11.80	12.52
Leverage	0.36	0.18	0.24	0.36	0.49
Years	10.02	3.97	8.00	10.00	13.00
Panel C: Negative dividend premium (N=54)					
Dividend	0.48	1.50	0.00	0.00	0.38
Cater	-0.50	0.44	-0.72	-0.50	-0.28
Collusion1	0.36	0.31	0.10	0.30	0.63
Collusion2	1876.06	2068.55	119.97	959.76	3239.15
Return	-0.03	0.29	0.01	0.05	0.07
Size	11.88	1.19	11.49	11.88	12.54
Leverage	0.33	0.27	0.07	0.32	0.54
Years	15.98	2.91	14.00	17.00	18.00

Table 2. Pearson correlation matrix — years of positive and negative premium

Spec.	*Dividend*	*Cater*	*Cater-Coll.1a*	*Cater-Coll.1b*	*Cater-Coll.2a*	*Cater-Coll.2b*	*Return*	*Size*	*Leverage*	*Years*
Dividend	1.00	-0.16	0.12	0.07	-0.11	0.07	0.12	-0.03**	0.09	0.02
Cater	0.70***	1.00	0.48***	0.36***	0.62***	0.36***	-0.03**	-0.18	-0.51***	0.16**
Cater- Coll.1a	0.42***	0.67***	1.00	0.76***	0.77***	0.76**	-0.17	-0.19	0.08	0.06
Cater- Coll.1b	0.39***	0.44***	0.67***	1.00	0.58**	0.83***	-0.14	-0.19	0.09	0.04
Cater- Coll.2a	0.55***	0.63***	0.80***	0.53***	1.00	0.58**	-0.10**	-0.07	0.03	0.08**
Cater- Coll.2b	0.40***	0.44***	0.69***	0.98***	0.54***	1.00	-0.15**	-0.18	0.13	0.06
Return	0.34***	0.37***	0.33***	0.28**	0.39***	0.28***	1.00	0.21	-0.39***	-0.14
Size	0.11*	-0.01	-0.15***	-0.23***	-0.11	-0.24***	-0.09	1.00	0.17	0.06
Leverage	-0.32***	-0.35***	-0.39***	-0.35***	-0.34***	-0.37***	-0.43***	0.15**	1.00	-0.04
Years	0.24***	0.25***	0.20***	0.08	0.18***	0.07	0.02	0.24***	0.13*	1.00

Note: *, **, *** – statistical significance at the 10%, 5%, and 1% levels

The abbreviation *CaterCall.* stands for the variable *CaterCollusion*, while *1a*, *1b*, *2a* and *2b* are the model designations. All coefficients under the main diagonal of this matrix are calculated for positive premium years, while those above it are for negative ones.

Table 3. Estimation results

Specification	Positive dividend premium				Negative dividend premium			
	Model 1a	**Model 1b**	**Model 2a**	**Model 2b**	**Model 1a**	**Model 1b**	**Model 2a**	**Model 2b**
Intercept	0.061	-0.105	0.029	-0.118	0.738	0.991	0.738	1.015
Cater	0.883**	0.787**	0.913**	0.783**	-1.089	-0.654	-1.089	-0.669
CaterCollusion1	-0.137	0.167*			1.137	0.629		
CaterCollusion2			-0.126	0.175*			1.137	0.630
Return	0.091	0.144	0.139	0.151	0.972	1.030	0.972	1.015
Size	-0.009	0.005	-0.007	0.006	-0.102	-0.130	-0.102	-0.129
Leverage	-0.229**	-0.148	-0.198*	-0.143	-0.017	0.438	-0.017	0.387
Years	0.021***	0.017***	0.020***	0.017**	0.043	0.043	0.043	0.041
F test	2.452	2.536	2.502	2.535	1.139	1.323	1.139	1.291
p-value	0.000	0.000	0.000	0.000	0.387	0.263	0.387	0.281
Breusch-Pagan; $\chi^2(1)$	14.072	16.274	15.238	16.419	0.043	0.004	0.043	0.003
p-value	0.000	0.000	0.000	0.000	0.835	0.950	0.835	0.960
Hausman; χ^2(K)	23.267	21.668	25.891	21.324	9.367	13.179	9.368	12.605
p-value	0.001	0.001	0.000	0.002	0.153	0.040	0.154	0.050
Linear restriction test	x	85.185	x	86.929	x	x	x	x
p-value	x	0.000	x	0.000	x	x	x	x

Note: *, **, *** – statistical significance at the 10%, 5%, and 1% levels