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CONTENTS

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CONTENTS

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CEO pay ratio versus financial performance in Polish public companies

Katarzyna Byrka-Kita[1] Karol Bulasiński[2]

Abstract

In this paper, we aim to investigate the relationship between CEO pay ratio and corporate financial performance in Polish public companies. Using a sample of 259 companies listed on the Warsaw Stock Exchange, we demonstrate that links between the pay gap and accounting measures of performance differ from market ones. Our findings indicate a negative correlation between CEO pay ratio and return on sales. This implies that companies pay executives less during periods of high profitability, possibly to avoid the negative impact of excessive pay on firm performance. We also discover that the pay gap, measured by CEO pay ratio, is positively linked with Tobin's *Q* and annual stock returns. A high CEO pay ratio signals strong incentives for top executives to perform, potentially leading to better strategic decisions and, consequently, higher Tobin's *Q* ratios and annual stock returns.

Keywords

- executive compensation
- pay disparities
- corporate governance
- financial performance

JEL codes: G32, G38, M52.

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Introduction

Over the past 40 years, the richest 1% of the world's population income share has increased from 16% to about 21%, while the middle-class share has decreased from 64% to 61% (Alvaredo et al., 2018). In terms of income, it is becoming increasingly difficult to advance to the group of extremely rich, while it is becoming easier and easier to fall below the level of wealth already gained (Mroczek-Dąbrowska & Shemesh, 2020). At the same time, corporate boards overseeing the operations of the biggest publicly quoted companies in the US are granting excessive compensation packages to their top executives, who have experienced a significantly greater growth rate compared to the stock market and the remuneration received by average workers, college graduates, and even individuals within the top 0.1% income bracket (Bivens & Kandra, 2022). The CEO-to-average-employee remuneration ratio rose from 20:1 in the early 1960s (Bivens & Kandra, 2022) to 399:1 in 2021 (D'Mello et al., 2024). Ineffective remuneration policies for chief executives in financial services institutions have been noted as one of the reasons of the recent financial crisis. They encouraged risky decisions focused on short-term results, which guaranteed high bonuses for management (Kirkpatrick, 2009). In US Dodd-Frank Wall Street Reform and Consumer Protection Act passed in the aftermath of the 2008 financial crisis states that the company should disclose information on the relationship between the executives' current remuneration and the company's financial performance as measured by changes in the company's share price including dividends. The company should additionally disclose: (a) the median annual remuneration of all employees of the company except for the CEO (or equivalent), (b) the total annual CEO remuneration (or person in equivalent position), (c) the ratio of the amount described in clause (a) to the amount described in clause (b) (Act, 2010). European measures differ primarily because of the form of the regulation. While remuneration regulations in the United States take the form of laws, in Europe they are primarily recommendations incorporated into national codes of good practice.

As far as theory is concerned, the pay gap is explained by two alternative models, tournament theory and equity fairness. These two theoretical approaches offer different explanations for the wage differential. Tournament theory assumes that wage disparities improve the company's performance because they encourage employees to be promoted (Lazear & Rosen, 1981). To promote motivation throughout the organizational structure, the reward at every stage of the tournament ought to rise, with an additional award for the general winner (i.e., the CEO) (Rosen, 1986). The other theory suggests that wage differences are detrimental to the company because they foster feelings of inequality, deprivation and reluctance among employees, which

can lead to decreased effort or cooperation (Akerlof & Yellen, 1988; Edmans, Gosling et al., 2023). Adams (1963) posits that the attitudes and behaviors of individuals are influenced by the process of comparing rewards with those of others. The prestigious CEO awards play a significant role as a benchmark that influences employees' reactions to their own remuneration when making these comparisons (Wade et al., 2006).

Though, the empirical research does not allow for a clear understanding of wage inequalities at company level. The authors dealing with this issue in their publications focused mainly on examining the impact of wage disparities on the company's financial results (Dittman et al., 2023; Fan et al., 2019; Imai, 2017; Rouen, 2020) or the staff productivity (Bao et al., 2020; Chi et al., 2018). So far, the empirical research has mainly concerned companies operating in the USA (Rouen, 2020) and China (Fan et al., 2019). There are very few papers on Germany (Dittman et al., 2023) and the UK datasets (Imai, 2017), a fact that can be explained by the lack of a European equivalent to the US Dodd-Frank Wall Street Reform and Consumer Protection Act, which explicitly requires the disclosure of remuneration and the structure of remuneration.[3] However, there are numerous studies (Andres & Aperte, 2018; Duffhues & Kabir, 2008; Khenissi et al., 2022) examining the relationship between executive pay and firm performance in Western European settings, but very few on Central and Eastern Europe (Haid & Yurtoglu, 2006; Mäkinen, 2007; Sajnóg & Rogozińska-Pawełczyk, 2022). Our paper adds to the existing research in multiple ways. First, we analyse wage discrepancies on the Polish capital market. Existing papers focus on compensation. Furthermore, we expand current evidence on the effect of profitability on the CEO pay ratio that to date has focused on the US market. Our findings demonstrate that pay equity is associated with accounting performance measures, as well as the link between executive remuneration and market valuation.

The remainder of this paper is organised as follows: Section 1 provides hypothesis development. The research methodology and data are presented in Section 2. The analysis of the empirical results is included in Section 3, while last Section concludes the paper.

[3] The European Corporate Governance Forum's statement on directors' remuneration (https://ec.europa.eu/commission/presscorner/detail/en/IP_09_459), as well as the amendments to the German Corporate Governance Code, the Government Commission (https://www.ecgi.global/sites/default/files/codes/documents/220627_german_corporate_governance_code_2022.pdf), the UK Corporate Governance Code (https://www.frc.org.uk/library/standards-codes-policy/corporate-governance/uk-corporate-governance-code/) and Best Practice for GPW Listed Companies (https://www.gpw.pl/pub/GPW/files/DPSN2021_EN.pdf), are the only recommendations on remuneration policy for managers in Germany, UK and Poland.

1. Hypothesis development

The level of compensation and wage disparities at the company level have been extensively debated in management science, human resources, and corporate finance. Studies in the first stream deal with organisational decision-making. According to Yanadori and Cui's (2013) research, wage disparities in R&D teams have a negative impact on company innovation. However, the study was restricted to high-tech companies and concentrated on horizontal rather than vertical wage disparities. Similarly, Chan et al. (2020), referring to Pay Equity Theory, find a negative link between R&D efficiency (R&D efficiency is defined as the percentage increase in revenue from a one-percent increase in R&D spending) and CEO-employee pay gaps, implying that larger pay gaps reduce employee motivation and effort.

Human Resources scholars also examine the CEO pay ratio frequently. Chi et al. (2019) argue, in reference to Tournament and Income Comparison theories, that a larger pay gap has a greater impact on employee productivity than a smaller pay gap. Moreover, they discovered that the link between pay gap size and employee productivity is nonlinear. The rate of productivity growth decreases as the pay gap widens. According to Bao et al. (2020), the degree of management entrenchment and involvement in high-tech industries determines the negative indirect impact of pay inequality on firm performance via employee satisfaction.

The third perspective on the CEO pay ratio relates to corporate finance. Drawing on classical economic theory, Lei (2017) suggests that a high CEO-to-worker pay ratio can be explained by CEO bonus-taking, which raises credit risk, or efficient labour cost management, which lowers credit risk. Overall, the findings of his study indicate that a larger gap between CEO and employee compensation correlates with a reduced cost of debt (a higher likelihood of a credit rating upgrade). This relationship is more pronounced for labour-intensive firms than for capital-intensive firms and weakens as the growth rate of average employee compensation increases; this suggests that credit investors include information regarding the efficacy of labour cost management into their risk assessment of the CEO-employee pay gap. Furthermore, when CEO compensation increases substantially, the negative correlation between the change in the cost of debt and the change in CEO-employee pay disparity is diminished (Lei, 2017). Rouen (2020), referring to Tournament theory, observes no correlation between the pay ratio and firm accounting performance as measured by the industry-adjusted return on net operating assets. Cheng et al. (2017) also refer to Tournament theory, arguing that the CEO pay ratio is positively related to firm value and firm performance (measured by ROA) one year ahead. They also note that firms with high CEO pay ratios are more likely to make value-enhancing acquisitions, arguing that high-income

CEOs make better acquisition decisions. According to these authors, an average-high CEO pay ratio is not a symptom of weak corporate governance and excessive profit-making by CEOs. They claim that their results support the notion that high CEO pay ratios are a consequence of market competition for limited director talent (Cheng et al., 2017). Similarly, Uygur (2019) finds that the pay ratio and firm performance are positively related, but only in the case of highly skilled CEOs. At the same time, the sensitivity of pay-performance diminishes when CEOs with low abilities receive excessive compensation. In their recent study referring to pay equity theory, Dittman et al. (2023) also claim that firms with high pay inequality exhibit a higher return on assets than firms with low pay inequality.

Existing literature has mainly focused on US datasets. Furthermore, due to the fact that CEO pay ratios do not have to be disclosed in Europe, the empirical analyses performed on European datasets concentrate on links between CEO compensation (not CEO pay ratio) and performance. Sajnóg and Rogozińska-Pawełczyk (2022), building on agency theory, indicate that there is a positive relationship between higher CEO compensation and the financial performance in companies listed on the Polish Stock Exchange. Duffhues and Kabir (2008), who examined whether executive pay on the Dutch market reflects company performance, concluded that there is a negative association between pay and financial performance, explaining that influential directors can influence their own compensation. Mäkinen's study (2017) finds no evidence of a relationship between changes in CEO remuneration and changes in ROA in Scandinavian countries. However, lagged measures of accounting and stock market firm performance are linked with a change in total CEO remuneration. He also argues that foreign ownership is positively and statistically significantly related to remuneration levels. The study by Raithatha and Komera (2016) suggests that Indian company performance, as measured by accounting as well as market measures, significantly influences executive remuneration; however, they also note a lack of association between remuneration and performance among smaller sample firms and firms associated with business groups.

To the best of our knowledge, links between CEO pay ratio and financial performance of Polish public companies have not been studied yet. As noted above, many studies focus on examining CEO pay ratio in the US context, but the results are not conclusive. Research conducted on datasets from Europe primarily investigates CEO compensation rather than the CEO pay ratio. This pay ratio, which focuses on the relationship between CEO and employee pay, raises the issue of salary stratification, highlighting a fundamental difference between the two. Therefore, we put forward the following hypothesis: *There is a positive relationship between the CEO pay ratio and the financial performance of Polish listed companies.* Investigating this relationship in the Polish context will help fill a gap in the literature and provide practical guidance for compensation and management policies in Polish companies.

2. Methodology and data

Existing literature has demonstrated that there is a wide range of factors that affect wage dispersion in public companies. In our study, we want to capture wage dispersion linked to various types of profitability. The general form of our estimations can be summarised as follows:

$$CEO\ pay\ ratio = a_0 + a_1\ Perf_{it} + a_2\ Size_{it} + a_3\ Leverage_{it} \quad (1)$$

The dependent variable is the CEO pay ratio. Initially, the intention was to construct this ratio by dividing the CEO's compensation by the average employee compensation within the company. However, due to the lack of reliable data regarding the number of employees in each company in our database, we needed to construct an alternative version of CEO pay ratio that could serve in place of unavailable variable. In order to solve this problem and to estimate the average annual employee compensation for each company in the sample, we used the average sectoral[4] salary in the Polish economy, a similar approach proposed by Uygur in his research (2019), which used the average hourly salary of employees for each industry as the average salary of employees. This data was obtained from Statistics Poland, which provides publicly available information on average sectoral salaries. The next step involved determining CEO compensation. The CEO was identified as the director explicitly designated as such in the company's financial statements. CEO compensation data was manually collected from published annual financial statements. Whenever possible, the components of CEO compensation included salary, bonus, restricted stock grants, option grants, and long-term incentive payments. It is important to note that due to the lack of standardized reporting practices for CEO compensation data, it was often challenging to precisely identify the specific components included in the reported compensation, as they were typically presented as a single aggregated figure under the label "compensation." Based on the data described above, we calculated the CEO pay ratio in the following way:

$$CEO\,pay\,ratio = \frac{CEO\,pay}{Average\ sectoral\ salary\ in\ the\ Polish\ economy} \quad (2)$$

The explanatory variable of primary concern is the financial performance of the firm (Perf). In our paper, like Rouen (2020), Mäkinen (2007), Raithatha and Komera (2016), Sajnóg & Rogozińska-Pawełczyk (2022), we consider both accounting-based and market-based profitability measures.

[4] PKD code classification.

The application of these two approaches is motivated by their differences. Accounting measures, derived from a company's financial records, offer insights into its historical financial position and performance (Mäkinen, 2007). Market measures convey the market's perception of a company's value, providing real-time insight into current market sentiment and expectations regarding the company's future prospects (Rouen, 2020).

The first accounting measure is industry-adjusted return on net operating assets (Adj RNOA). We chose this measure over simple return on assets (ROA) because it provides a more accurate picture of a company's profitability compared to other companies in the same industry (Rouen, 2020). The second accounting measure is return on sales (ROS), which is defined as operating profit divided by total sales (Duffhues & Kabir, 2008). Lastly, the third accounting measure is change in sales, which represents sales growth (Cheng & Zhang, 2023; Mo et al., 2018). For market measures, we first used annual stock return (RET), which is a purely market measure (Duffhues & Kabir, 2008; Gibbons & Murphy, 1990; Rouen, 2020). The second market measure is the Tobin's *Q* ratio (Duffhues & Kabir, 2017). This is a hybrid measure based on both accounting and market perspective, defined as the ratio of the market value of common equity and the book value of debt to the book value of total assets. These five variables serve as proxies for corporate financial performance and are widely used in studies focusing on corporate performance.

Additional variables controlling the company's internal situation are consistent with existing research. We account for firm size, which is defined as the natural logarithm of total assets (Size). Many studies of compensation show that executives of larger firms receive relatively higher compensation (Zhou, 2000). Next, we account for debt, which is scaled by total assets. Debt holders closely monitor management actions, which can reduce excessive executive pay (Admati et al., 2018). However, higher leverage can also increase the firm's risk, thereby necessitating higher compensation. In Table 1, we present all the financial measures used in the study.

We use data for 259 companies listed on the Warsaw Stock Exchange as of December 31, 2019. The raw data sample consists of 449 firms; however, we exclude all financial institutions and enterprises that do not report CEO compensation. Our sample period is 2015–2019, and we winsorise the financial data at the 1/99 percentile level to remove outliers. Financial information for all companies is sourced from the Orbis database. CEO compensation data for the entire period are manually collected from companies' annual reports and Internet sources. Average workers' compensation was gathered from Statistics Poland.

Average value of CEO pay ratio is 19.961, which means that CEOs earned on average almost 20 times more than their employees. In Figure 1, we present the average CEO pay ratio for the research period.

Table 1. Definition of the variables

Variable	Formula	Data	Reference
Dependent variable			
Proxy CEO pay ratio	CEO pay / Average sectoral salary in Poland	hand collected	Uygur (2019)
Independent variables			
RNOA	operating income x (1 – tax rate))/((total assets – total cash) – (total liabilities – total debt)) – median two digit SIC code RNOA	Orbis database	Rouen (2020)
Q	ratio of the sum of market value of common shares and book value of debt to book value of total assets	Orbis database	Duffhues & Kabir (2008)
ROS	operating earnings over total sales	Orbis database	Duffhues & Kabir (2008)
Sales Change	the percentage difference in sales revenue between one year and the previous year	Orbis database	Mo et al. (2018); Cheng & Zhang (2023)
RET	annual stock return	Orbis database	Rouen (2020); Duffhnues & Kabir (2008); Raithatha & Komera (2016); Gibbons & Murphy (1990)
Control variables			
Leverage	total debt to total assets	Orbis database	Martinez-Ferrero et al. (2024)
Size	natural logarithm of total assets	Orbis database	Firth et al. (2006), Farooq et al. (2023)

Source: own compilation.

The highest CEO pay ratio was 21.600 in 2016, and the lowest was 18.583 in 2019. Overall, the ratio declined slightly over the five-year period. Due to the specific design of the CEO pay ratio in our analysis, the reasons for the observed decline in the CEO pay ratio index in Poland can be attributed to slower growth in average wages in the economy, among other things. Moreover, an increase in public awareness and social pressure regarding inequality and fairness in compensation may have prompted company boards to adopt more moderate compensation for executive directors.

As we have used sectoral data, in Table 2 we present the CEO pay ratios calculated using the average salaries relevant to the specific sectors included in the Polish Classification of Activities.

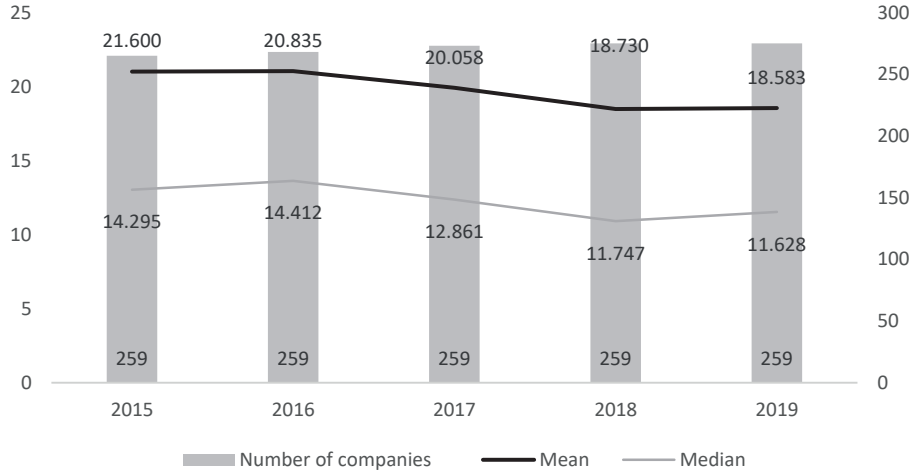

Figure 1. Summary statistics of CEO pay ratio for the sample of Polish listed firms

Source: own compilation.

Table 2. All financial measures used in the study

PKD symbol	Polish Classification of Activities	CEO pay ratio
B	Mining and quarrying	18.704
C	Manufacturing	21.559
D	Electricity, gas, steam, hot water and air conditioning supply	23.210
E	Water supply; Sewerage, waste management and remediation activities	24.817
F	Construction	27.018
G	Wholesale and retail trade; Repair of motor vehicles, including motorbikes	15.338
H	Transport and storage	18.903
I	Accommodation and food service activities	26.632
J	Information and communication	18.186
L	Real estate activities	33.355
M	Professional, scientific and technical activities	11.797
N	Administrative and support service activities	21.708
Q	Health care and social work activities	14.402
R	Arts, entertainment and recreation activities	13.117
S	Other service activities	16.379

Source: own compilation.

We can conclude that the highest wage disproportion occurred in the real estate activities and construction sectors. The lowest recorded wage disproportion was in the professional, scientific and technical activities and arts entertainment and recreation activities sectors.

In addition, in Figure 2 we demonstrate how the CEO pay ratio developed for companies listed on the WIG20 (above) and mWIG40 (below).

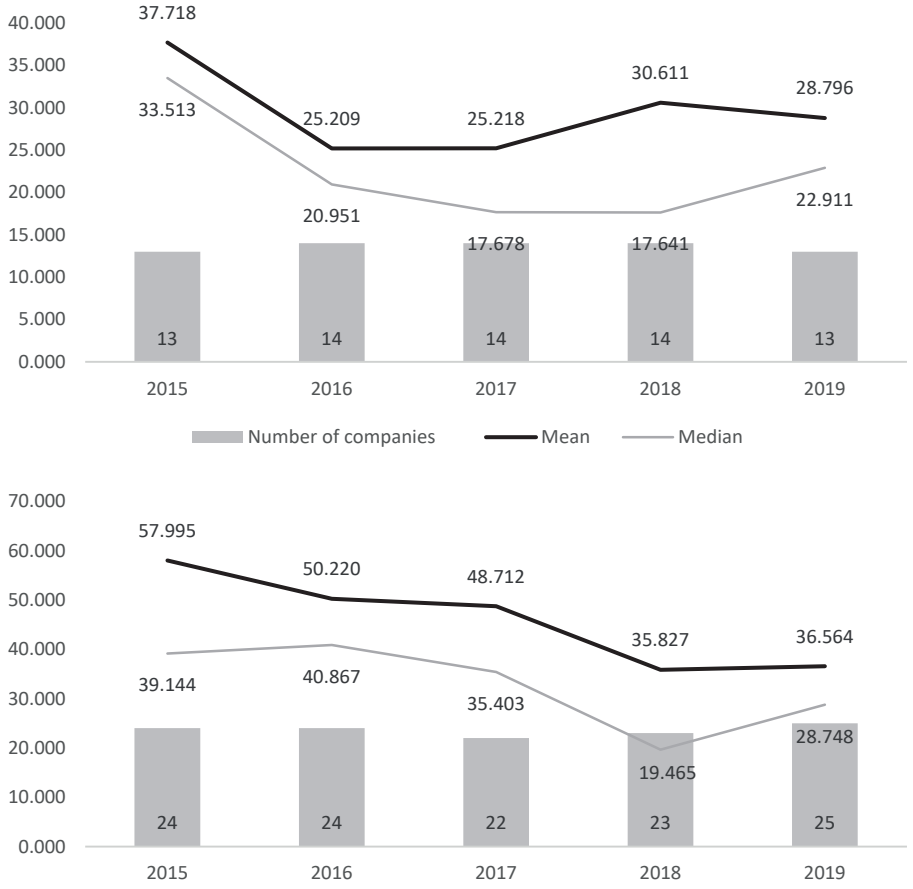

Figure 2. Yearly summary statistics of CEO pay ratio for the sample of Polish listed firms by WIG20 (above) and mWIG40 (below)

Source: own compilation.

In the case of companies included in the WIG20 and mWIG40 indices, the average CEO pay ratio stood at 29.400 for the WIG20 index, and 45.822 for the mWIG40 index. Such a significant difference between the indicated indices and the entire research sample results mainly from the concentration of the largest Polish companies in the mentioned indices, where CEOs

manage much larger assets, which most likely entails higher remuneration. Descriptive statistics of the main variables are presented in Table 3. Notably, we had anticipated that companies in the WIG20 would have a higher CEO pay ratio than those in the mWIG40. However, our research sample does not include companies from the financial sector, which, on average, repre-

Table 3. Summary statistics

Stats	***N***	**Mean**	**SD**	**Median**	**Min**	**Max**
CEO pay ratio	1295	19.961	21.790	12.859	0.348	131.446
RNOA	1295	0.046	0.177	0.051	–1.027	0.722
Q	1293	0.375	1.556	0.004	–0.985	11.415
ROS	1295	0.035	0.212	0.038	–1.201	0.636
S.CHANGE	1294	0.076	0.256	0.046	–0.610	1.234
RET	1276	0.056	0.393	0.013	–0.705	1.396
Size	1295	11.435	1.706	11.258	8.143	16.262
Leverage	1295	0.492	0.198	0.491	0.069	1.054
Stats WIG20	***N***	**Mean**	**SD**	**Median**	**Min**	**Max**
CEO pay ratio	68	29.400	20.737	20.774	5.064	113.735
RNOA	68	0.061	0.068	0.056	–0.094	0.326
Q	68	0.747	2.813	0.010	–0.476	18.921
ROS	68	0.047	0.092	0.063	–0.250	0.336
S.CHANGE	68	0.112	0.299	0.052	–0.217	2.276
RET	68	0.032	0.327	–0.013	–0.661	0.946
Size	68	15.296	1.045	15.512	12.475	16.717
Leverage	68	0.493	0.141	0.481	0.110	0.847
Stats mWIG40	***N***	**Mean**	**SD**	**Median**	**Min**	**Max**
CEO pay ratio	118	45.822	39.366	35.201	4.027	192.365
RNOA	118	–0.084	1.487	0.070	–15.378	2.504
Q	118	0.797	2.001	0.219	–0.561	12.284
ROS	118	0.079	0.204	0.049	–1.287	0.877
S.CHANGE	118	0.114	0.334	0.067	–0.314	3.288
RET	118	0.157	0.623	0.081	–0.631	5.024
Size	118	13.375	1.106	13.457	9.566	15.857
Leverage	118	0.491	0.177	0.501	0.100	0.878

Source: own compilation.

sent 30% of the entire WIG20 index. Furthermore, there were companies in the mWIG40 where the CEO pay ratio exceeded 100.[5] We divided them into presentations of total data for the entire research sample and then distinguished the same data for companies included in the WIG20 and companies included in the mWIG40.

The variables based on book values, namely RNOA, ROS, and S.CHANGE, indicated positive values, which signify the relatively stable financial situation of the companies included in the research sample. However, it should be noted that the standard deviation for this group of variables ranges from 0.177 to 0.256, indicating significant dispersion in these results. The separation of the aforementioned variables for the WIG20 and mWIG40 indexes did not bring significant changes—the ratios, except for RNOA, were only slightly higher in the case of mWIG40 than in the case of the entire research sample.

A Tobin's *Q* ratio value of 0.375 indicates that the market value of the companies' assets is significantly lower than their book value. Such a situation may suggest that investors did not see much growth potential for the companies or that the assets were undervalued in the market. It should be noted that when we divide the research sample into subsamples including companies belonging to the WIG20 and mWIG40, the results undergo a significant change. In the case of WIG20, the Tobin's *Q* ratio is 0.747, while for mWIG40 it is as high as 0.797. A value of the ratio close to 1 means that the market value of the company is equal to its net book value of assets. This may suggest that investors have more confidence in the companies in these indices, recognizing that assets are appropriately valued relative to their book value.

The annual stock return (RET) is 0.056 with a standard deviation of 0.393. The results over that period indicate a general upward trend, while the value of the standard deviation demonstrates a high variability in the data, which is due to the varied research sample. Contrary to the *Q* index, the value of the annual stock return decreases for the WIG20 and mWIG40 subsamples.

Turning to firm characteristics, we use a logarithm of total assets as an indicator of company size. For the entire research sample, the average is 11.435 (billion PLN) and increases markedly for WIG20-only companies to 15.296 (billion PLN). Finally, the average leverage ratio for the companies included in the sample is 0.492, with a standard deviation of 0.198 and a median of 0.491. The results suggest that firms may adopt varied policies regarding the selection of financing sources. Furthermore, the factors that influence the debt and its structure could vary based on the industry of the company under consideration.

[5] Above 100 in 2015, the CEO pay ratio was for: Forte (111), Wawel (169), Comarch (192), in 2016: Forte (128), Comarch (137), Wawel (150), in 2017: Comarch (152), Wawel (146), in 2018: Comarch (128), Wawel (131), in 2019: Develia (101), Comarch (148).

3. Results

In specifications 1 to 5, we present sets of regressions that are similar except for the use of different measures of firm performance. Specification 1 uses the RNOA as the performance measure, specification 2 uses the Tobin's *Q*, specification 3 uses the return on sales (ROS), specification 4 uses the sales change (SCHANGE) and the last specification 5 is based on the annual stock return (RET). In each of these specifications, the dependent variable is CEO pay ratio and we additionally include control variables such as company size and leverage. Table 5 shows the results of the regression analysis for each specification. To test for multicollinearity among the independent variables, we create a correlation matrix, which indicates that multicollinearity among these variables is not an issue. The results are shown in Table 4.

Table 4. Correlation matrix

	RNOA	*Q*	ROS	SCHANGE	RET	SIZE	Leverage
RNOA	1.0000	–	–	–	–	–	–
Q	0.0433	1.0000	–	–	–	–	–
ROS	0.3605	0.2440	1.0000	–	–	–	–
SCHANGE	0.1741	0.0732	0.1922	1.0000	–	–	–
RET	0.1677	0.1976	0.2235	0.1541	1.0000	–	–
SIZE	0.0139	–0.2215	0.0979	0.0322	–0.0082	1.0000	–
Leverage	–0.1262	–0.3873	–0.2478	0.0287	–0.0879	0.1864	1.0000

Source: own compilation.

We use random effects for specifications 1, 2, and 5, fixed effects for specification 3 and pooled OLS model in specification 4. The decision was made using *F*-test statistics, the Breusch-Pagan test, and Hausman test. The *F*-test was employed to test the fixed effect, and the Breusch-Pagan test to check the random effect.

The regression results show that CEO pay ratio is significantly negatively related to ROS. High return on sales (ROS) may indicate operational efficiency and a company's ability to generate profits at relatively low costs. If this is the case, the disparity between executive and employee remuneration may be lower, as the achievement of high profitability may be the result of the effective actions of the company as a whole, and not just the result of individual executive actions. The negative relationship between return on sales and CEO remuneration was found by Duffhues and Kabir (2008), although they do

Table 5. Analysis of the relationship between CEO pay ratio and financial performance

	RE-GLS	RE-GLS	FE-OLS	P-OLS	RE-GLS
RNOA	–2.375				
	(1.923)				
Q		0.892**			
		(0.400)			
ROS			–4.287**		
			(1.796)		
SCHANGE				–1.842	
				(2.158)	
RET					2.346***
					(0.737)
Leverage	–13.407***	–10.627***	–16.952	–5.803***	–12.774***
	(3.183)	(3.257)	(3.775)	(2.839)	(3.155)
Size	4.787***	4.923***	2.572***	5.378***	4.850***
	(0.589)	(0.589)	(1.200)	(0.330)	(0.589)
Observations	1,295	1,293	1,295	1,294	1,276
R-within	0.01	0.01	0.02	–	0.02
R-overall	0.16	0.18	0.11	–	0.17
R-between	0.19	0.21	0.13	–	0.20
R^2	–	–	–	0.17	–
F-Test	18.73	18.24	18.76	18.69	18.70
p-value	0.0000	0.0000	0.0000	0.0000	0.0000
Breusch-Pagan Test	9.27	94.77	14.94	0.05	31.27
p-value	0.0023	0.0000	0.0001	0.8310	0.0000
Hausman Test	1.56	0.00	9.02	0.60	3.69
p-value	0.2122	0.9830	0.0027	0.4394	0.0546

Note: P-OLS – Pooled OLS, without fixed effects or random effects; RE-GLS–model with random effects, FE-OLS – fixed effects model. The superscripts *, **, and *** denote statistical significance (based on standard errors clustered by firm level) at 10%, 5%, and 1%, respectively.

Source: own compilation.

not focus on CEO pay ratio *per se*. They concentrate on directors' remuneration itself and not the pay gap expressed by the CEO pay ratio.

Next, we observed a positive significant relationship between CEO pay ratio and the RET and Tobin's *Q* ratio. The effect of positive annual stock return (RET) on executive compensation may be due to the capital markets' appreciation of the company outcomes. If executives effectively manage the company and contribute to the increase in stock value, they may receive higher compensation in the form of bonuses or profit sharing, compared to the salary of an average employee in the company. Similar results are found in the study by Ozkan (2007), which finds a positive and significant relationship between CEO pay ratio and annual stock return, while Gibbons and Murphy (1990) demonstrate the opposite results. However, it should be noted that both studies looked at the value of the pay itself and not the CEO pay ratio.

The Tobin's *Q* ratio combines both accounting and capital market aspects. If the market value of shares exceeds the book value of assets, it means that investors expect future growth in the company's value. Executives responsible for achieving a high Tobin's *Q* ratio can be rewarded with higher salaries. We can also observe a positive relationship between CEO pay ratio and Tobin's *Q* ratio in the Uygur (2019) study (but only if the CEO's level of skills is high). The opposite relationship was found in the study by Sajnóg and Rogozińska-Pawełczyk (2022), who found that the association between CEO remuneration and the Tobin's *Q* ratio is negative, but significant.

For the control variables, the logarithm of the company's assets (an indicator of the company's size) has proved to be a positive and statistically significant determinant of salary. This positive relationship is consistent with the results reported by Firth et al. (2006). Debt has a significant negative impact on executive compensation, a point in line with the common agency explanation, which argues that a large amount of debt is associated with greater managerial control by debt providers, and thus lowers executive compensation.

Conclusions

In this paper, we examine whether wage disparities are linked to the financial performance of companies listed on the Warsaw Stock Exchange for the period 2015–2019. We find that there is no clear evidence of a positive relationship between CEO pay ratio and various company performance measures in Poland. A positive significant relationship has been observed for the Tobin's *Q* ratio and annual stock returns (RET). This suggests that executive compensation may be linked to market valuation and expectations of future growth. On the other hand, return on sales (ROS) is negatively related to the

CEO pay ratio, indicating that companies may reward executives less when high profitability is achieved through collective efforts rather than individual managerial actions. Overall, the results of this study suggest that Polish companies are trying to comply with the codes of best practice and maintain corporate governance standards by aligning executive compensation with company performance.

As a result, our hypothesis was only partially supported, since market ratios like Tobin's *Q* and RET show a significant positive relationship, whereas accounting measures like ROS indicate a significant negative relationship or no relationship at all (in the case of SCHANGE and RNOA). These results appear to be consistent with the agency theory approach, which assumes that managers will seek to enhance shareholder value to minimize conflicts of interest (Castellanos & George, 2020). Polish companies appear to be seeking to align executive remuneration policies in a way that incorporates shareholder value and reflects their financial performance and market valuation.

Studying this ratio will contribute to a better understanding of the growth of pay inequality across industries and companies. It will also identify potential factors affecting these differences, such as company size, sector of activity or concentration of power. The analysis of the CEO pay ratio will provide scientific evidence on the existence of a link between pay inequality and company financial performance. These results will inform policy decisions on wage regulations and income equality. Appropriate legislation can be developed based on sound data and analysis showing the impact of pay inequality on the financial performance and stability of companies.

The analysis of the CEO pay ratio is particularly important in the context of regulation, as it can provide a basis for introducing appropriate regulations on equal pay in companies. This is particularly relevant in Poland, where there are currently no binding regulations on CEO pay. Possible legislation could require the disclosure of information on the ratio of CEO pay to that of employees at lower levels of the organizational hierarchy, which would increase transparency and openness within companies.

It is important to recognize the limitations of this study. Future research could expand the analysis by covering a longer period, potentially including years affected by events such as the COVID-19 pandemic, where an unexpected shock could change the relationship between CEO pay ratio and performance (Ye et al., 2023). In the future, if more detailed data become available as a result of the Corporate Sustainability Reporting Directive (CSRD), particularly its component, the European Sustainability Reporting Standards (ESRS), the definition of the CEO pay ratio employed in this study should be revised. Further research should also extend the scope of the study throughout Europe in order to compare different economies. Studying CEO pay ratios in many countries would help us understand how economic, cultural, and political systems influence wage stratification. This analysis would be particu-

larly relevant in light of increased interventionism. Finally, it would be also interesting to investigate how different types of corporate ownership affect CEO pay ratio. Does the presence of foreign investors result in a greater pay gap? This could help us better understand the impact of ownership structures on remuneration in various economic settings. This is important because foreign owners may implement compensation patterns from their countries of origin, potentially aligning CEO pay with the norms of the investor's country rather than the country in which the company operates, thus affecting local pay structures and economic dynamics.

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