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DOES GENDER DIVERSITY IN MANAGEMENT MATTER? THE CASE BASED ON POLISH COMPANIES FROM RANKING PUBLISHED BY PULS BIZNESU

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Abstract: This article examines the relationship between gender diversity in statutory bodies and woman's odds of being a business leader in Poland. Under the empirical framework we assume that gender diversity in the boardroom can improve the quality of work and lead to better decision-making, and thus affect financial outcomes and increase the probability that a female director will be rewarded by an external institution. The sample consists of 82 firms from the "Business Woman" plebiscite organized by Puls Biznesu in 2012-2021. Our dataset contains information on the members of statutory bodies, i.e.: gender, age, tenure, and function, as well as financial and organizational characteristics of the companies. The variables were collected manually from the InfoVeriti database and EMIS database. We measure gender diversity on boards using Herfindahl – Hirschman Index. Drawing on critical mass theory by measuring gender diversity as levels of female representation in the boardroom, this study finds a positive and significant relationship between gender diversity and the laureate's ranking position.

Keywords: gender diversity, leadership, firm performance, logistic regression

JEL Codes: C50, D22, M14

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INTRODUCTION

In the history of the Bank of Sweden's Alfred Nobel Prize in Economic Sciences, only three times have women been winners. Elinor Ostrom received the prize for her research on the economic aspects of common property management by user associations, and Esther Duflo was recognized for conducting experimental research to increase understanding and reduce poverty [Nobel Prize, 2023][1]. The 2023 laureate was Claudia Goldin, who is conducting research about women in the labor market and the causes of the wage gap between men and women [NY Times 2023].

Gender pays inequality exists in many countries and does not only affect lower and middle level employees, but also senior management. The size of the wage gap between men and women depends on age, length of service and education profile [Goldin and Polachek 1987], maternity choices [Budig and England 2001], but also on sectoral solutions to employment flexibility and the availability of remote work [Goldin 2014]. One method of indirectly influencing the wage gap has been legislative initiatives in Norway, France and Spain regarding gender parity in statutory bodies and important management positions[2]. As Cohen and Huffman, [2007] have shown, there is a positive relationship between women's participation in decision-making and the reduction of the pay gap, but at the same time, analyses by McKinsey&Company, Boston Consulting Group and Forbes confirm that the inclusion and diversity policies of organizations contribute to their business success.

Our study examines whether a positive relationship between women's involvement in management and business financial performance also increases their chances of personal career success. Considering previous research results, we assume that there is a positive relationship between the diversity of statutory bodies and the business success of women who own or manage businesses. The study was conducted on a sample of 100 winners of the "Business Women" ranking in 2012-2021. The plebiscite is an initiative of the Polish daily newspaper Puls Biznesu, which aims to promote the growing role of women in the management of businesses in Poland and to publicize their impact on the economy. Spreading the positive impact of women's participation in economic life. Based on the estimated logit and probit models, we found that the diversity of statutory bodies is a factor that increases

[1] Both award winners conducted their research in teams. Esther Duflo received the award jointly with Abhijt Banerjeem and Michael Kremer. Elinor Ostrom conducted research with Oliver Williamson.

[2] Norway was the first country to propose and later introduce gender balance regulations for board positions (Odelstingsproposisjon 97, 2002-2003). Nevertheless, within just a few years, France (Copé-Zimmermann Law) and Spain (Equality Act 2007) followed similar paths and introduced some forms of quota regulations (see [Seierstad et al. 2017]). The European Gender Equality Strategy 2020–2025, includes the promotion of gender equality and women's empowerment in firms as one of its key areas [European Commission 2020].

women's chances of professional success, but at the same time we note the limitations of our study related to the selection of enterprises and the methodology adopted.

We have divided our study into five sections. In Section LITERATURE REVIEW, we develop hypotheses that can be tested and discuss the related literature. Section SAMPLE describes our data and explains how we estimated the main variables used in our empirical analysis. In Section EMPIRICAL FINDINGS, we present the empirical results and explore how gender diversity in the boardroom contributes to women's success in leadership positions. We conclude in Section CONCLUSION with a summary of our findings and opportunities for future research.

LITERATURE REVIEW

Different interpretations of the term 'diversity' can be found in the literature [Khatib et al. 2020]. Authors of foreign reports and research studies present diversity from the perspective of age, gender, education, racial and ethnic affiliation, or skin color. In recent years, interest in gender and racial diversity on company boards has intensified. According to this direction, it is not only important because it can affect the company's performance, but also because it is essential for growing and modern companies. The application of diversity in business affects the company's image internally and externally. Magnanelli and Pirolo [2021, 37-38] pointed out that making decisions that contribute to the promotion of diversity in statutory bodies shows that the company is being run responsibly and has a positive impact on the company's image in the eyes of shareholders. Companies whose statutory bodies consist of a multicultural society are better perceived by investors, shareholders, customers, and other stakeholders.

A key element that builds relationships between investors, management, stakeholders in a company is effective corporate governance. The corporate governance structure allows the organisation to achieve its objectives, take appropriate action and monitor performance [OECD 2004]. Both external factors, such as regulations and policies, and internal factors including the relationship between owners, managers and the board of directors affect corporate performance [Jeżak 2010].

The solutions presented are applicable to the domestic and international market, enabling companies to effectively manage their statutory body structure and business processes, which could contribute to success in the economic environment.

The Diversity Matters report [Hunt et al. 2015] analyses organisational diversity in relation to three aspects: gender, ethnicity, and race. Researchers from McKinsey&Company argue that corporations that focus on developing diversity are likely to attract value-adds to their teams in the form of top industry professionals and can improve the image of the organisation in the eyes of the customer. Stahl [2021] suggests that customers feel more attachment and are more likely to buy from companies with ethnically and culturally diverse employees. Companies with

diverse teams tend to perform better financially because they can take advantage of broader growth opportunities and effectively reach new markets, leading to increased profits [Stahl 2021]. Lorenzo et al. [2018] reported that companies with more diverse management teams have 19% higher revenues through innovation. In contrast, Ely and Thomas [2020] contend that diversity does not lead to financial improvement, but there are indirect links to financial performance. Diversity enhances work quality, decision-making, team satisfaction, and equality [Ely and Thomas 2020]. Companies with more diversity are 70% more likely to reach new markets and are better at decision-making by as much as 87% than homogeneous companies [Stahl 2021].

The creators of the above initiatives conclude that diversity in the workplace matters. It gives employees the chance to experience a different culture and different experiences. This can result in good relationships between employees and managers, the enrichment of new professionals in the company and better results, not only financially.

Although board diversity is a growing and significant body of literature, there is still much focus on gender diversity only [Khatib et al. 2020]. However, there are differing views on the role of female directors and on the benefits of increased gender diversity on boards for the performance of companies.

Adams and Ferreira [2009] present that companies with at least one woman director tended to be larger, have more business segments, show better ROA performance, and lower volatility. On the other side are results indicating no significant correlation between company performance and gender diversity reported by Fernandez-Temprano and Tejerina-Gaite [2020]. Singh and Dwesar [2022] reviewed the link between gender diversity on boards of directors on corporate performance, and they results are mixed. Some studies showing either positive or negative effect of women on board on firm performance and its risk, whereas others suggesting no relation between the two.

It should be noted that there is a limited number of studies evaluating the influence of boardroom gender diversity on the financial performance of polish companies. For example, Kompa et al. [2023] findings suggest that the presence of women in boardrooms has a limited impact on the financial performance of companies listed on the Warsaw Stock Exchange in Poland. Similarly, Maj [2017] reported that the gender composition of the management and supervisory boards have no influence on the firm financial performance in companies listed on the Warsaw Stock Exchange.

The above discussion on gender diversity and company's performance leads us to posit that gender-diverse boards are linked to business success. However, there is a lack of empirical evidence that gender diversity of boards, particularly the proportion of female board members, is associated with their individual success. Considering previous research results, we assume that there is a positive relationship between the diversity of statutory bodies and the business success of women who own or manage businesses:

Hypothesis: Increased gender diversity on boards is positively and significantly associated with the likelihood of individual success for female board members.

SAMPLE

To test the association between gender diversity of boards[3] and their chances of individual success, we used sample of Polish firms from the "Business Woman" plebiscite organized by Puls Biznesu[4] in 2012-2021. Our dataset includes information on 100 firms, with the top 10 firms selected for each year. Specifically, we collected data on the members of statutory bodies, including their gender, age, tenure, and function, as well as the financial and organizational characteristics of these firms. The data was collected manually using the InfoVeriti and EMIS databases. However, for some companies, we could not obtain financial and corporate governance information. As a result, the sample used in our regression analysis consists of 82 firms.

Panel A of Table 2 presents descriptive statistics for the statutory bodies. Panel B describes the characteristics of the companies, while Panel C provides details on the characteristics of the winners.

The supervisory board typically consists of 1 to 2 members on average, with a maximum of 22 members and a minimum of 0 members. With a maximum of 24 members and a minimum of 1 member, the Board of Directors usually consists of an average of 3 to 4 members. The descriptive data suggest a significant heterogeneity of the sample. The HHI index is 0.42. This means that there is a high diversity of members of statutory bodies in the sample. The average age of the winners is 56. They range from a minimum of 30 to a maximum of 79. The average length of service on a statutory body is 7.85 years, with tenures ranging from 1 year as the shortest to 20 years as the longest.

The value of assets usually determines the size of a company. The average value of a company's assets is just under 0.7 million, with a maximum of 23 billion and a minimum of 19 thousand. Meanwhile, a liquidity ratio serves as an indicator of a company's ability to pay its debts, with an average ratio of 0.53.

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[3] Board gender diversity is calculated with a Herfindahl-Hirschman Index [Rhoades 1993] using the formula $HHI = m^2 + w^2$, where m is the percentage of men on statutory bodies (management and supervisory boards) and w is the percentage of women on statutory bodies. For example, if one firm had 4 female board members ($HHI_{first} = 1.00$) and another firm had 2 female and 2 male executives ($HHI_{second} = 0.50$), using the HHI formula allowed us to credit the second firm as having a more diverse statutory body. An HHI of 1.0 indicates a team where everyone has the gender. Increases in the HHI indicate a decrease in diversity. Decreases in the index indicate an increase in diversity [Hunt et al. 2015].

[4] "Business Woman" plebiscite is a cyclical ranking promoting entrepreneurship of women in the Polish business world.

Table 1. Descriptive statistics

Variable	N	min	mean	sd	median	max
Panel A: Statutory bodies						
HHI	100	0.00	0.41	0.39	0.25	1.00
Management board members	99	1.00	2.44	1.73	2.00	11.00
Supervisory board (binary)	99	0.00	0.28	0.45	0.00	1.00
Number of women on statutory bodies	99	0.00	0.79	0.57	0.67	4.00
Panel B: Firm characteristics						
Assets (ln)	94	11.17	18.55	1.87	18.43	23.90
Assets growth (in %)	88	0.00	1.54	2.96	1.07	26.34
Liquidity ratio	99	0.00	0.73	1.94	0.19	15.24
Panel C: Laureate characteristics						
Age (in years)	95	30.00	55.99	10.03	56.00	79.00
Tenure (in years)	99	1.00	7.85	4.57	7.00	20.00

Source: own elaboration

The dependent variable of the study is the inverse of the ranking in the Puls Biznesu "Business Woman" plebiscite. Rank is therefore a qualitative statistical variable that expresses the quality of a characteristic. For this type of data, standard models can be used to explain the probability. Specifically, we estimate two models: the probit model and the logit model, each with four regressions. In both sets, the rankings were transformed according to the scheme presented in Table 5.

Table 2. Ranking transformation and dependent variable creation rules adopted

Five-level dependent categorical variable		Three-level dependent categorical variable	
Ranking in "Business Woman" plebiscite	models 1, 2, 5, 6	Ranking in "Business Woman" plebiscite	models 3, 4, 7, 8
10-9	1	10-8	1
8-7	2	7-4	2
6-5	3	3-1	3
4-3	4		
2-1	5		

Source: own elaboration

To make the dataset suitable for ordered logistic regression, we use a similar approach like Gruszczyński [2006]. The ranking was converted into a five-point and a three-point categorical variable (a discrete variable ordered from lowest to highest values). In the case of models 1 and 2 and 5 and 6, a five-level categorical variable taking values from 1 to 5 was taken as the explanatory variable (Y). Winners who were ranked in places 1 and 2 were designated as 5, winners from places 3 and 4

were assigned to category 4 and similarly for the remaining places up to category 1. For models 3 and 4 and 7 and 8, a three-stage categorical variable was used in which the laureates ranked 1-3 were labelled as category 3, the laureates ranked 4-7 as category 2 and the laureates ranked 8-10 as category 1. The transformation of ranked places into categorical variables is made possible using ordinal logit modelling and ordinal probit modelling programmed in the statistical package STATA 13 IC.

For the two tables, 8 equations need to be made. These can be first degree equations and second-degree equations. A first degree equation will look like the following:

$$P(winner) = \alpha_0 + \alpha_1 * HHI + \alpha_k * explanatory\ variables_k + \varepsilon$$

If:

P(winner) - probability of winning

$\alpha_0, \alpha_1, \dots, \alpha_k$ *- structural parameters*

ε *– random variable*

In contrast, the equation of degree two is of the form:

$$P(winner) = \alpha_0 + \alpha_1 * HHI + \alpha_2 * HHI^2 + \alpha_k * explanatory\ variables_k + \varepsilon$$

If:

P(winner) - probability of winning

$\alpha_0, \alpha_1, \dots, \alpha_k$ *- structural parameters*

ε *– random variable*

EMPIRICAL FINDINGS

Tables 3 and 4 below show what influences the placement of a particular winner in each ranking.

Table 3. Results of logit regressions of the probability of success in the "Business Woman" plebiscite

	(1)	(2)	(3)	(4)
HHI	**1.381***	-5.982	**1.721***	-3.979
	(0.814)	(4.072)	**(0.919)**	(4.783)
HHI^2		**6.093***		4.632
		(3.317)		(3.832)
Age	**-0.0532****	**-0.0523****	**-0.0515***	**-0.0494***
	(0.0247)	**(0.0248)**	**(0.0268)**	**(0.0268)**
Tenure	-0.0418	-0.0516	-0.0344	-0.0428
	(0.0586)	(0.0592)	(0.0636)	(0.0640)
Board members	0.0757	0.0462	0.0263	-0.00165
	(0.195)	(0.200)	(0.203)	(0.206)

	(1)	(2)	(3)	(4)
Supervisory Board	-0.617	-1.074	-0.397	-0.796
	(0.776)	(0.817)	(0.889)	(0.952)
Number of women on statutory bodies	-0.0879	0.363	-0.815	-0.428
	(0.602)	(0.629)	(0.776)	(0.805)
Legal form - limited liability company	0.545	0.768	0.345	0.493
	(0.953)	(0.952)	(0.990)	(0.999)
Legal form - cooperative	18.72	18.18	17.61	17.39
	(1117.6)	(1017.1)	(870.8)	(937.3)
Assets	**0.441*****	**0.450*****	**0.430*****	**0.431*****
	(0.149)	**(0.150)**	**(0.158)**	**(0.159)**
Assets growth	-0.0245	-0.0343	0.0184	0.0109
	(0.0579)	(0.0585)	(0.0629)	(0.0635)
Liquidity ratio	**0.217****	**0.201****	0.180	0.165
	(0.100)	**(0.101)**	(0.110)	(0.111)
Pseudo R^2	0.110	0.124	0.154	0.162
Chi^2	29.07	32.52	27.40	28.88
N	82	82	82	82

Standard errors in parentheses
* p < 0.10, ** p < 0.05, *** p < 0.01

Source: own elaboration

The analysis of the estimation results shows that both in the logit function, the HHI, HHI2, the age of the laureate, the natural logarithm of the balance sheet total and liquidity are significant in the model. According to these results, the most significant variables that influence the inclusion of the laureate in the respective ranking include the size of the company. The age of the laureate also influences where she is ranked. The younger the awardee is, the more likely it is to be ranked higher. Companies that had higher cash liquidity were more likely to appear higher in the ranking. The HHI indicates the diversity in the statutory bodies, from the above results if the statutory bodies in a company had greater diversity, then the company was more likely to appear in the ranking at higher positions.

Table 4. Results of probit regressions of the probability of success in the "Business Woman" plebiscite

	(5)	(6)	(7)	(8)
HHI	**0.802***	-3.938	**1.023***	-2.524
	(0.470)	(2.437)	**(0.533)**	(2.741)
HHI^2		**3.923****		2.899
		(1.979)		(2.203)

	(5)	(6)	(7)	(8)
Age	**-0.0295****	**-0.0301****	**-0.0296***	**-0.0295***
	(0.0147)	**(0.0148)**	**(0.0158)**	**(0.0159)**
Tenure	-0.0188	-0.0252	-0.0201	-0.0235
	(0.0349)	(0.0352)	(0.0372)	(0.0374)
Board members	0.0501	0.0314	0.0181	0.00547
	(0.112)	(0.113)	(0.121)	(0.121)
Supervisory Board	-0.376	-0.675	-0.249	-0.487
	(0.475)	(0.501)	(0.533)	(0.561)
Number of women on statutory bodies	-0.0761	0.200	-0.512	-0.269
	(0.346)	(0.376)	(0.459)	(0.485)
Legal form - limited liability company	0.197	0.407	0.166	0.311
	(0.555)	(0.568)	(0.602)	(0.615)
Legal form - cooperative	7.284	7.159	7.052	6.908
	(193.5)	(188.7)	(203.4)	(199.6)
Assets	**0.258*****	**0.271*****	**0.261*****	**0.267*****
	(0.0851)	**(0.0861)**	**(0.0916)**	**(0.0924)**
Assets growth	-0.0150	-0.0220	0.0111	0.00619
	(0.0382)	(0.0384)	(0.0401)	(0.0403)
Liquidity ratio	**0.122***	**0.112***	0.108	0.0996
	(0.0641)	**(0.0645)**	(0.0680)	(0.0685)
Pseudo R^2	0.109	0.124	0.156	0.166
Chi^2	28.66	32.61	27.90	29.64
N	82	82	82	82

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: own elaboration

HHI, HHI^2, firm size in terms of total assets and liquidity were found to be significant in the models according to the table above. The interpretation of the results of the probit regression will be like that of the logit regression.

CONCLUSION

Through econometric analysis, the empirical study found a significant impact of the diversity of statutory bodies on the laureates' positions in the rankings. Age plays a key role, with younger awardees more likely to achieve higher rankings. Company size also matters, with larger companies more likely to achieve higher positions in the Puls Biznesu plebiscite. Liquidity is another determinant, as candidates from companies with higher liquidity tend to achieve higher rankings.

The analysis suggests that diversity among statutory bodies can enhance the success of women in business. However, it is important to note the study's limitations, including the lack of a control group, insufficient details on the criteria for selecting female winners of the Puls Biznesu, incomplete financial data and a narrow focus on gender diversity. Future studies could examine longer time series, alternative profitability ratios and dynamics between owners and statutory bodies.

The impact of board diversity on financial performance is a complex issue that requires further research. An increasing number of organisations are beginning to recognise the benefits of diversity and are taking steps to create more diverse teams. This can lead to positive changes in the organisation and in financial performance. While the analysis provides some basis for concluding that board diversity affects financial performance, one should be cautious and aware of the limitations of the study.

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