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THE IMPACT OF BOARD GENDER DIVERSITY ON FINANCIAL PERFORMANCE AT HIGH-PERFORMING AND LOW-PERFORMING FIRMS

OLGA DZENE [1]

IRINA SENNIKOVA [2]

ABSTRACT

The impact of corporate board gender diversity on firm financial performance has been topical for at least the last five decades; however, there is still no clear answer regarding whether gender diversity has a significant effect on organizational performance. Recent academic research (2010-2022) from different countries provides contradictory results in terms of the positive or negative effect of women's representativeness on corporate boards. Our paper contributes to the understanding of this issue based on a sample of the top 500 Latvian firms, analysing financial performance during a three-year period. As an indicator, we took the two accounting-based measures most frequently used in other research – return on assets (ROA) and return on equity (ROE) – and correlated it to female presence on company boards.

The findings are based on quantile regression analysis and show a statistically significant positive impact on both ROA and ROE. Quantile regression demonstrates a stronger impact on ROA at high-performing companies. It also shows a positive impact on ROE, which grows together with higher firm performance.

The results suggest that the gender diversity effect is not homogeneous and has a significantly larger positive impact at high-performing firms relative to low-performing firms.

The paper contributes to the scientific debate on the impact of board gender diversity and provides the basis for broader research on different aspects of board gender diversity and firm performance going beyond financial indicators.

Keywords: gender diversity, female CEO, corporate boards, financial performance

JEL Classification M14, L25

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[1] Olga Dzene, RISEBA University of Applied Sciences, Latvia. E-mail: olga.dzene@gmail.com
[2] Irina Sennikova, RISEBA University of Applied Sciences, Latva. E-mail: irina.sennikova@riseba.lv

INTRODUCTION

In recent decades, gender diversity on boards has attracted considerable attention among academic researchers, politicians, practitioners and business managers. A lot of papers, statistical reports and literature devoted to exploring reasons and potential solutions for increasing gender diversity at the highest management levels have been published, but the situation has not experienced sufficient positive development yet and the issue is still open for discussion. Nowadays we are still far from gender parity in terms of women's representativeness on corporate boards. And even if in recent years the situation has improved in almost all geographic regions and countries, the changes have been far from uniform; the dynamics are not stable. "Women may not (always) be superheroes, there is little doubt that they will influence firm and societal outcomes" (Adams, 2016).

Researchers continue to discover and explore reasons (ethical, financial, social, corporate, governmental) for improving the situation with gender diversity on boards (Amorelli and Garcia-Sanchez, 2020; Byron and Post, 2016; Baselga-Pascual et al., 2018; Garcia-Sanchez et al., 2019; Lückerath-Rovers, 2013; Pucheta-Martinez et al., 2016; Safdar et al., 2018; Xie et al., 2020). Scholars have hypothesized a number of different organizational-level benefits associated with gender diversity on boards (Conyon and He, 2017). Considering the growing number of women on corporate boards, it is important to understand whether gender diversity, and women's representativeness in particular, have any impact on organizational performance. It is still an open question what women bring to the boardroom table and how gender diversity affects firm performance.

Academic research provides three main perspectives on the impact of gender diversity: the financial performance perspective (Adams and Ferreira, 2009; Arzubiaga et al., 2018; Bao et al., 2014; Chen et al., 2018; Conyon and He, 2017; Cumming et al., 2015; Lückerath-Rovers, 2013; Mahadeo et al., 2012; Martin-Ugedo and Minguez-Vera, 2014; Muller-Kahle and Lewellyn, 2011; Nadeem et al., 2019; Post and Byron, 2015), the ethical perspective (Arayssi et al., 2020; Baselga-Pascual et al., 2018; Wu et al., 2019) and the corporate governance perspective (Amorelli and Garcia-Sanchez, 2020; Azmat and Rentschler, 2017; Byron and Post, 2016; Francoeur et al., 2019; Glass et al., 2016; Jeong and Harrison, 2017). This means that gender diversity on corporate boards is a multi-dimensional phenomenon, including the aspect of human rights, equality between genders, gender psychology, group and organizational performance, corporate governance, etc.

If we look at which academic journals publish research regarding gender diversity on boards and firm financial performance, we find such journals as the Academy of Management Journal, the British Journal of Management, the European Economic Review, the Journal of Management Studies, the Economic Journal, the European Economic Review, the Journal of Management & Governance, Contemporary Accounting Research, the Journal of Business Research and others.

Regarding geographical scope, previous research mostly comes from such countries as the US, the UK, China and some highly developed European countries: Norway, Spain, France, Switzerland, Denmark, Sweden, and Italy. Recently, an increasing amount of research has been coming from developing markets, e.g., India, Singapore, and Palestine (Pandey et al., 2022; Duppati et al., 2020; Habash and Abuzarour, 2022; Saleh et al., 2022). However, there is still a lack of empirical evidence based on data and statistics from Central and Eastern European countries, especially from post-Soviet territory, that could offer additional insights into the impact of board gender diversity. With our paper, we make an attempt to close this gap by analysing a sample from a country in the Central and Eastern European region, Latvia, where the situation with gender equality is far from ideal. 63.4% of the top 500 Latvian companies are still managed by completely male boards, whereas women are represented in only 36.6% of them. Moreover, Latvia performs far worse than average in the European Union when it comes to gender equality. In 2021, it demonstrated 14.6% wage disparity, reaching as high

as 31% in such business sectors as banking, insurance, and information technologies (European Union, 2023).

Financial performance is traditionally researched using market-based (Tobin's Q) and accounting-based measures (ROA, ROE, ROS) (Haslam et al., 2010; Carter et al., 2010; Reguera-Alvarado et al., 2017; Gregory-Smith et al., 2014; Post and Byron, 2015; Green and Homroy, 2018; Yang et al., 2019; Lückerath-Rovers, 2013; Conyon and He, 2017). But research findings bring rather controversial results, as they demonstrate all possible variations of the impact of gender diversity on firm financial performance: positive, negative and neutral. There are still no answers in the literature as to why in some cases gender diversity may have a positive impact on organizational performance while in others it may be negative. A recent trend in the literature is that researchers are starting to look deeper into the issue, trying to understand the context and the reasons for different outcomes (Saleh et al., 2022; Slama et al., 2019; Habash and Abuzarour, 2022).

Moreover, we indicated the lack of knowledge of the conditions that control or modify the relationship between board gender diversity and financial performance. There is no clear answer in the literature as to what additional factors – related to the characteristics of organizations, different aspects of corporate governance, the proportion of women on boards, and others – create the framework for a positive impact. It is not clear why the research results are so contradictory. With our research, we would like to make a contribution to understanding the factors that may support gender diversity on boards to make a positive impact on organization financial performance.

The aim of this paper is to examine the relationship between gender diversity on the boards of the top 500 Latvian companies and accounting-based measures of company financial performance (ROA and ROE), checking the moderation effect of firm performance and studying the difference in gender diversity's impact for firms with higher and poorer financial performance results.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Reviewing the literature, we find two main directions of research regarding the impact on financial performance: direct impact on financial performance through different financial performance indicators like ROA, ROE, ROS, Tobin's Q and others (Habash and Abuzarour, 2022; Arvanitis et al., 2022; Saleh et al., 2022; Conyon and He, 2017; Post and Byron, 2015; Lückerath-Rovers, 2013; Carter et al., 2010; Green and Homroy, 2018; Orlitzky et al., 2003) and indirect impact through the perspective of firm risk, which is especially important in the context of long-term financial performance (Sila et al., 2016; Bao et al., 2014; Cumming et al., 2015; Adams, 2016; Farzan et al., 2020; Saeed and Sammer, 2017). Also, in previous research we identified an additional focus on information asymmetry in the market (Abad et al., 2017), cash dividend payments (Saeed and Sammer, 2017), market reaction to the appointment of a female chief executive officer (Gregory et al., 2013), long-term financial performance and short-term stock market returns (Jeong and Harrison, 2017) and other aspects.

A quite popular approach in creating a research model is to use some variables connected with accounting returns including accounting-based measures of firm performance such as ROA and ROE. ROA is usually taken as earnings before extraordinary income and preferred dividend in financial year t / (average of book values of total assets at the beginning and at the end of financial year t) and ROE as earnings before extraordinary income and preferred dividend in financial year t)/(average of book values of common equity at the beginning and at the end of financial year t) (Lückerath-Rovers,

2013; Haslam et al., 2010). It is also popular to analyse the impact of women on boards on financial performance related to market performance including market-based measures of firm performance such as Tobin's Q. According to Lückerath-Rovers (2013), this measure, developed by Tobin (1969), compares the market value of a company with the replacement value of the company's assets.

If we focus on the impact on financial performance, based on the three most popular measures in the literature, we can identify a whole range of conclusions. There is a group of authors that find a positive impact of women's leadership on organization financial performance: Mahadeo et al., 2012; Lückerath-Rovers, 2013 Carter et al., 2010; Post and Byron, 2015; Reguera-Alvarado et al., 2017; Green and Homroy, 2018. A study by Martín-Ugedo and Minguez-Vera (2014) found that the probability of women on the board increases with firm performance, defined as ROA, and family ownership, but diminishes with corporate ownership and firm risk. It also finds a positive effect of the presence of women board members on firm performance. But together with such research there are also alternative views identifying a negative impact (Bohren and Strom, 2010; Haslam et al., 2010; He and Huang, 2011; Ahern and Dittmar, 2012; Yang et al., 2019) or stating that there are no links between women on boards and organization financial performance indicators (Miller and Triana, 2009; Haslam et al., 2010; Carter et al., 2010; Gregory-Smith et al., 2014; Post and Byron, 2015). Zhang and Qu (2016) and Yang et al. (2019) conclude that there is a negative impact on organizational performance related to women's appearance on boards. Analysing a sample from China, Zhang and Qu (2016) focused on the issue that due to gender differences in executive leadership positions, a CEO succession process with gender change may amplify the disruption of the process and thus adversely affect post-succession firm financial performance. Additionally, they found that the impact of male-to-female succession on firm performance may be weakened by positive organizational attitudes toward female leadership as indicated by the presence of other female leaders on the firm's board of directors and/or top management team and the successor's origin inside the firm. Thus, we see that in the case of succession, the appearance of women on a board may negatively impact organization financial performance, which contradicts previous research. Yang et al. (2019) analyzed how the gender quota in Norway affects firm performance through the rapidly increasing proportion of females on boards and found clear evidence that firms' financial performance was negatively affected. But both studies came from very specific samples: China, where the gender diversity level on boards is quite low from a global perspective – only 10.6% women on boards – and Norway, where women's proportion on boards is the highest in the world – 41% (Deloitte, 2019).

Some authors, like Jeong and Harrison (2017), provide us with summarized views from different research. They conducted a comprehensive synthesis of the research on how women's representation in top management teams and CEO positions affects firm performance. They tested predictions using meta-analytic techniques on a sample of 146 primary studies conducted in 33 different countries and found that women in the upper echelons in general is positively and weakly related to long-term financial performance.

Research (see Fig. 1) attempting to establish links between gender diversity and financial performance is abundant but sometimes controversial and conflicting. Some authors provide data about positive links, some about negative, and some do not see any links. But when we combine the body of research, we can observe that on accounting-based measures like ROA and ROE, as opposed

to market-based measures like Tobin's Q, a positive impact of gender diversity on boards is demonstrated more frequently.

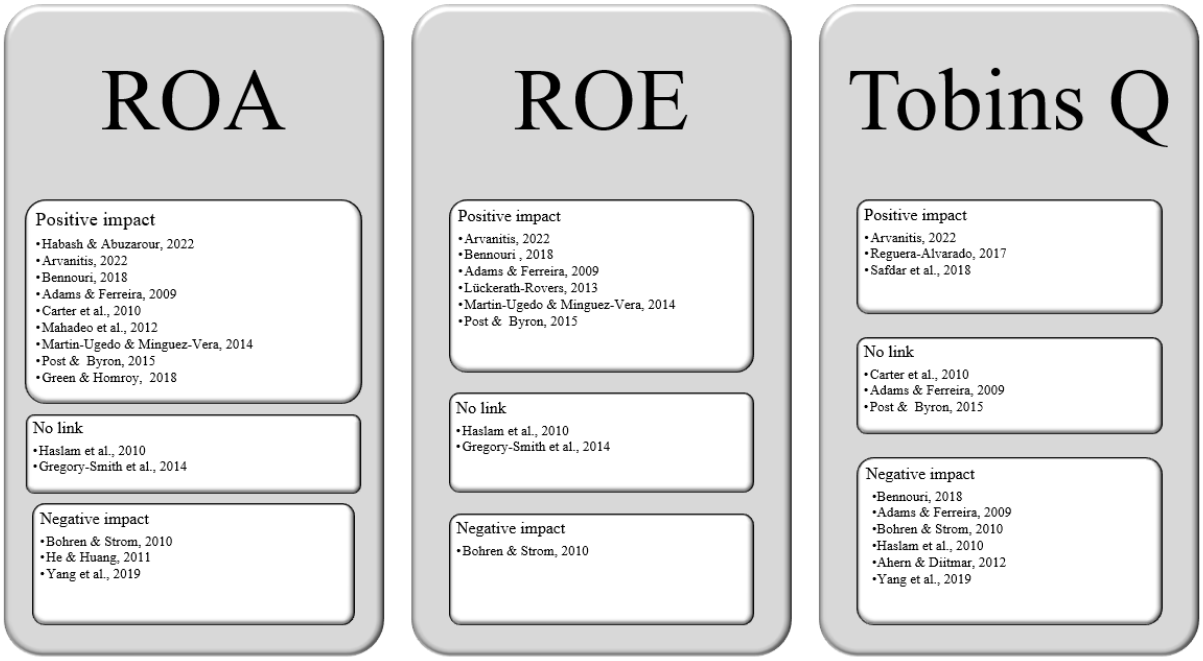

Figure 1 Summary of research regarding the impact of women's representativeness on organization financial performance

Previous research results allow us to make an assumption that in the Latvian context we will also observe a correlation between board gender diversity and company financial performance. The current study, based on our best knowledge, is the first in Latvia to analyse the effect of gender diversity on boards on company financial performance. Thus, our first research hypothesis is as follows:

H1. Measured by the accounting-based indicators ROA and ROE, gender diversity has an impact on organizations' financial performance.

It would also be important to understand why gender diversity on boards may impact the financial performance of organizations. We identified some research that focused on the topic of why women on boards bring added value to organizations. It is possible that all corporate directors share certain personality traits and that women who become corporate directors have these personality traits in common with male directors. Yet, if female directors always behave the same as male directors, we would not expect to find that diversity has any impact on board governance. Therefore, we have to find differences in behaviours between men and women. In psychology literature, women are described as being more ethically sensitive than men, particularly in ethical dilemma situations (Roxas and Stoneback, 2004). Also, according to gender socialization theory women are socialized to embody communal values more than men; thus, women should be more likely to react ethically in dilemma situations (Mason and Mudrack, 1996). The stronger ethical disposition of women translates

into stronger ethical leadership, providing a more ethical work climate that promotes transparency in financial reporting and earnings (Ho et al., 2014). Researchers also pay attention to gender diversity's impact on decision-making. Such an approach assumes that women's characteristics and values are different from men's, and gender diversity serves as a predictor for a more ethical approach in making decisions (Cumming et al., 2015). Huang and Kisgen (2013) showed that men tend to be overconfident and use a more aggressive and risky approach in corporate decision-making compared to women. However, Johnson and Powell (1994) reviewed the literature on men and women working on management-level decision-making and found no difference in risk taking. A corporate board performs as a team, and this team impacts the development and success of the entire organization. One group performance mechanism is group dynamics, and because of group diversity and different opinions, approaches and discussions, group dynamics on boards improve (Nadeem et al., 2019). The authors provide evidence that organizations with women on boards avoid excessive risk taking and manage existing risks, which ultimately improves firm performance. Women do not make risk-free investments but contribute to improved financial performance through well-grounded and widely discussed decision-making.

Researchers demonstrate continuous interest in the impact on organizational performance of women's representativeness on boards and emphasize difficulties in summarizing conclusions based on previous data, since the data, in their opinion, is not trustable and interpretable. Adams (2016) investigated the specific problem of research on women's impact on organizations' performance – a lack of objective information and different methods of result interpretation in previous research. He identified the problem of endogeneity in data analysis, stating that the "endogeneity problem arises when the variable of interest in a regression is correlated with the error term". Based on Adams's conclusions, the literature regarding women's impact on performance faces three main challenges: data limitations, selection and causal inference. Recognizing and dealing with these challenges is important for developing informed research and policy. Thus, we see that some opponents doubt previous research, identifying many limitations and asking the question of whether women on boards really give benefits to organizations.

Going in-depth in the analysis and creating our second hypothesis, we identified the scope of research that uses a more detailed and complicated approach, considering not only linear connections between women on boards and financial performance, but also looking at potential moderating effects, factors and obstacles in which gender diversity may have a positive or negative impact on financial performance. Some authors continue in the direction of critical mass theory and analyse the moderating effect of women's proportion on boards (Gharbi and Othmani, 2022). Others look at the positive effect of corporate social responsibility on organizations. Saleh et al. (2022), based on 384 observations from all firms listed on the Palestine Security Exchange during the period from 2010 to 2017, discovered that under the moderating effect of CSR, the impact on firm financial results goes from positive insignificant to positive significant. Some authors, like Rubino et al. (2021), pay attention to women directors' characteristics. They identified that the link between gender diversity and financial performance may be affected by specific characteristics, such as the education of female directors on the board, their nationality, and the number of other positions they hold in other boards of directors. For example, they found that graduate women directors strengthen the positive link between women on boards and firm financial performance.

Some authors examine gender diversity's impact on financial performance in combination with the dispersion of performance and find differences in impact in high-performing and low-performing firms (Conyon and He, 2017; Pandey et al., 2022; Duppati et al., 2020; Habash and Abuzarour, 2022; Slama et al., 2019). The leading global consulting organization McKinsey regularly measures women's impact on financial performance through the lenses of profitability or EBIT margin (earnings before interest and taxes) (Hunt et al., 2015; Krivkovich et al., 2017; Huang et al., 2019). Huang et al. (2019), based on data from 1,000 organizations from 12 countries, found that companies from the top quartile regarding gender diversity on executive teams more than 20% outperformed on profitability compared with firms from the fourth quartile.

Triana et al. (2014) described the moderating effect of firm performance on the impact of gender diversity on organizational performance through the lens of strategic changes. The authors claim that in obstacles of low performance, based on threat-rigidity theory, groups may experience a decrease in information exchange and an increase in group thinking problems: groups start to discuss fewer alternatives, utilizing different communication channels and different opinions less.

Conyon and He (2017), using annual data from over 3,000 US firms from 2007 to 2014, show that the presence of women on the board has a positive effect on firm performance, and this effect varies at different parts of the performance distribution. They investigated how the effect of the presence of women directors alters the dispersion of firm performance. The results suggest that female directors have a significantly larger positive impact at high-performing firms relative to low-performing firms. An additional finding is that female directors have a stronger quantitative impact on conditionally high-performing firms compared to low-performing firms. According to Habash and Abuzarour (2022), Palestinian non-financial listed enterprises, from 2015 to 2019, demonstrated a positive effect of gender diversity on boards on the financial performance of high-performing firms. The authors also solved the endogeneity problem using additional statistical methods. Slama et al. (2019), analysing the impact of gender diversity on ROA and using a sample from France (listed firms from the period of 2008-2011), discovered the same effect – that firm performance increases for more diverse boards in high-performing firms – and additionally found that accounting performance results reach the highest level with a 40% proportion of women on boards.

Therefore, we may expect that the impact of gender diversity on business performance in not similar and equal across different levels of organization financial performance. The current study is the first in Latvia to analyse the differences in the effects of gender diversity on boards on business performance and to check the moderating effect of a firm's financial success. This leads us to the second hypothesis:

H2: Gender diversity has a different impact on financial performance depending on different performance levels and is positive in high-performing firms.

Data and sample

Unfortunately, in Latvia there are no publicly available statistics prepared by local institutions about males and females in decision-making positions in Latvian business organizations. Therefore, we requested data from Lursoft IT, an official representative of the top 500 Latvian companies. We were interested in the board gender composition and companies' financial performance. Initially, we

received data for the year 2016 and then extended it by two more years, including the years 2017 and 2018. More recent data was not available at that point. As a result, we had data for three consecutive years and 1,500 firm-year observations. With the intention to continue the study when more recent data is available, this allowed us to see the trend.

To test the relationship between the gender composition of a company and organizational performance, we constructed a panel from 2016 to 2018. The primary data set consists of 1,500 firm-year observations of the 500 largest companies in Latvia. We removed firms with missing data, and the final data set consists of 1,430 observations for the period of three years.

As we can see from Table 1, there is a stable and even negative tendency in women's representativeness on boards in Latvia – 20.6% in 2016, decreasing to 19.4% in 2018. Meanwhile, the amount of all-male boards grew from 61.4% in 2016 to 63.4% in 2018. The proportion of female CEOs was 8.96% in 2016 and grew to 10.63% in 2018. This means that the situation in Latvia is far from gender parity and gender diversity on the executive board level.

Table 1 Women on boards in Latvia in figures

Year	Total number of board members	Females on boards	Women % on boards	Female CEO %	% of all-male boards
2016	1216	250	20.6%	8.96%	61.4%
2017	1248	242	19.4%	8.76%	61.8%
2018	1204	238	19.8%	10.63%	63.4%

Measures

Several measurements of gender diversity and women's representativeness on boards were used in our research as independent variables (see Table 2). We used such measures as any women on the board (whether or not the board had any women on it (Haslam et al., 2010; Green and Homroy, 2018)), female CEO, and the percentage of female board members, which was calculated as the number of women on boards divided by the total number of board members (Haslam et al., 2010; Green and Homroy, 2018; Reguera-Alvarado et al., 2017). However, the previous variables have not always been the most effective measurement of gender diversity. Large percentages of women signal homogeneity on boards, but not diversity, which is more important for us. Any women on the board and a female CEO could mean that there is only one woman on the board, which would not show gender diversity or partnership. The Blau index measures the degree of heterogeneity among board members with respect to gender. This index is widely represented in previous research and accepted as an optimal measure of diversity to capture variations within a group of people (Harrison and Klein, 2007). It is also an ideal measure of diversity, since, according to Miller and Triana (2009), it meets the four criteria for an effective measure of diversity: it has a zero level to represent homogeneity, higher numbers indicate better diversity, the index does not use negative values, and the index is not unbounded. For board gender diversity, the Blau index can vary from 0, when there is only one gender on the executive board, to 0.50, when there is an equal proportion of men and women on the board.

As the first dependent variable describing organization financial performance, we use return on assets (ROA) (see Table 2), which is classified as the accounting-based measurement of financial performance (Mahadeo et al., 2012). It comprises a measurement of income produced as a return of the resources used to generate that income. A positive ROA result means that the asset owned can produce income for the organization. ROA has been used in numerous studies regarding board gender diversity (Yang et al., 2019; Green and Homroy, 2018; Gregory-Smith et al., 2014; Post and Byron, 2015; Mahadeo et al., 2012; Martin-Ugedo and Minguez-Vera, 2014). The second dependent variable we use is return on equity (ROE), another accounting-based measure (earnings before extraordinary income and preferred dividend in financial year t)/(average of book values of common equity at the beginning and at the end of financial year t) (Haslam et al., 2010).

As control variables (see Table 2), we apply size of the company, as indicated by two variables: size of the board (total number of board members) and the number of employees in the organization (Haslam et al., 2010).

Table 2 Measures with descriptions

Measure	Description
ROA	Return on assets – accounting-based measurement of financial performance of an organization
ROE	Return on equity – accounting-based measurement of financial performance of an organization
Any women on the board	Organizations where a woman is represented either as a board member or as a CEO
Women % on the board	Proportion of women on the board in total board size in percentage
Blau index	Degree of heterogeneity among board members with respect to race or gender (from 0 to 0.5)
Female CEO	Organization where the CEO position is held by a woman
Number of employees	Size of the company – total amount of employees in the current year
Board size	Total number of board members, including the CEO

Quantile regression method

Prior studies have to a large extent applied the conditional mean regression to indicate the relation between women on boards and different aspects of firm financial performance and assume that the effects of board gender diversity are stable across the performance range. We suggest looking at the gender diversity impact on firm performance through the lenses of different performance levels in organizations and using the quantile regression method.

As stated by Conyon and He (2017), quantile regression describes the relationship between a random dependent variable and a group of independent factors in great detail. In this way, compared to the usual conditional mean regression used in applied research, conditional quantile regression provides a better description of the regression function. In our case, we are interested in the impact of women on corporate boards (input) on business performance (outcome). As Xue and Zhang (2019) mentioned, the method goes far beyond simply forecasting measurements of central tendency. An entire family of quantile regressions can be estimated. The 25th percentile of the result variable, the 75th percentile of the outcome variable, or any other quantile that the researcher is interested in can

be predicted using the quantile regression approach. Furthermore, quantile regression results are unaffected by outliers in the data set. As a result, quantile estimations are less susceptible to the effect of extreme data points. However, as Xue and Zhang (2019) indicated, the most essential reason for utilizing quantile regression is that it allows for a more comprehensive quantification of the relationship between a dependent and independent variable. As Habash and Abuzarour (2022, p. 369) state, the most important rationale for using quantile regression is that a complete picture of the relation between a dependent and independent variable can be quantified.

EMPIRICAL RESULTS

Table 3 contains the basic descriptive statistics for the sample. None of the key variables reach normal distribution. Some of the variables, namely female CEO, female proportion on the board, the Blau index, number of employees, or board size, follow lines of distribution other than normal.

Table 3 Descriptive statistics of key variables

	N	Average	Std. Dev.	Median	K-S test
ROA	1430	4.41	9.17	2.28	0.21
ROE	1431	10.57	382.45	17.06	0.42
Female CEO (%)	1500	6.47	24.60	0.00	0.54
Women % on the board	1463	18.96	28.53	0.00	0.36
Any women on the board	1463	38.76	48.74	0.00	0.40
Blau index	1463	0.14	0.21	0.00	0.43
Number of employees	1498	341.64	711.98	137.50	0.32
Board size	1500	2.45	1.43	2.00	0.19

* Test distribution is normal

At this stage of the analysis, we do not see a correlation between the Blau index, which describes gender diversity, and financial performance ROA and ROE. But we observe a positive correlation between female CEO and ROA: +0.08. This observation highlights the impact of a CEO on board decisions, which goes in line with previous research (Mersland and Strom, 2009; Ullah et al., 2019; Davis et al., 2010) that concludes that a female CEO has a significant positive impact on organization financial performance.

We also see a positive correlation between the organizational performance ROA and number of employees, +0.26, and a positive correlation between the financial performance ROA and board size: +0.10. In larger organizations, with larger boards, we may expect a positive impact on financial performance. This conclusion goes together with the explanation from the literature that for successful financial performance, organizations need large boards, with more members, which may bring different group dynamics and fruitful discussions at the board level, leading to more successful financial decisions. The corporate board performs as a team, and this team impacts the organization's development and successes. One group performance mechanism is group dynamics, and because of the group's different opinions, approaches and discussions, group dynamics increase (Nadeem et al., 2019).

There are statistically significant correlations between having any women on the board and ROE (0.07), but the correlation is negative.

Both variables – number of employees and board size – have negative correlations with ROE: number of employees has a negative correlation of 0.21 and board size has a negative correlation of 0.22.

Table 4 Correlations (Spearman's rho) between key variables

	ROA	**ROE**
Female CEO	0.08**	-0.04
Women % on the board	0.02	-0.04
Any women on the board	0.03	-0.07**
Blau index	0.05	-0.05
Number of employees	0.26**	-0.21**
Board size	0.10**	-0.22**

** p < 0.01 (2-tailed)
* p < 0.05 (2-tailed)

Overall, the correlations analysis (see Table 4) gives us the clear understanding that we can expect a positive impact of women on boards on ROA in case an organization has a female CEO and a negative impact on ROE if boards have any women. In the case of a larger organization (number of employees and board size), we can expect higher results in ROA and lower results in ROE. We see a very similar picture compared to previous literature – mixed findings regarding the impact on financial performance. This means that we need a more detailed, in-depth approach for data analysis, which is why we will use an additional statistical method: quantile regression analysis.

With nonparametric data, a quantile regression was performed as a tool to assess the impact of independent variables on the set of accounting performance measures. Quantiles 10, 25, 50, 75, and 90 were selected for depicting the main effects (Tables 5-6).

There are significant correlations between each of the independent and control variables and each of the accounting performance measures. Female CEO has a significant impact on ROA in quantile 50 ($p<0.01$) and is also significant in quantile 90 ($p<0.05$). On the other hand, women's percentage on the board and having at least one woman on the board have marginally significant effects at quantile 10 ($p<0.1$). It should be noted that percentage of women on the board has a positive impact, while having at least one woman has a negative impact. This could be augment-ed with previous research, connected with critical mass aspects. Namely, one woman on the board may not have the opportunity to impact common decisions because of the strong impact of men's opinions on these decisions (Amorelli and Garcia-Sanchez, 2020). Also, the Blau index has a marginally significant impact on ROA in quantile 10, 50, and 90, but not in quantile 25 or 75, and the impact is different – positive in quantile 10 and 50 and negative in quantile 90. Our observations vary. These results support our second hypothesis that the impact of gender diversity differs depending on different organization financial performance levels.

There is some effect of control variables on ROA: number of employees has a significant and positive effect in quantile 75 ($p<0.01$), and board size has a significant and positive effect in quantile 50 and 75 ($p<0.01$).

Table 5 Quantile regressions (ROA) in the 25th, 50th, and 75th quantiles

	ROA				
Variables	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
Female CEO	0.148	0.276	1.887***	3.824	7.869**
	(0.421)	(0.324)	(0.543)	(2.716)	(3.483)
Women % on the board	3.278*	0.102	1.477	-3.642	-6.030
	(1.751)	(0.710)	(1.350)	(2.973)	(6.703)
Any women on the board	-3.100*	-0.329	-1.993	3.051	5.266
	(1.768)	(0.688)	(1.333)	(3.009)	(6.362)
Blau index	3.625*	0.717	2.775*	-4.199	-13.137*
	(1.978)	(0.911)	(1.647)	(4.065)	(7.621)
Number of employees	-0.0003	0.0001	0.0004	0.001***	0.003
	(0.001)	(0.0002)	(0.0003)	(0.0001)	(0.003)
Board size	-0.080	0.063	0.351***	0.589***	1.246
	(0.122)	(0.068)	(0.115)	(0.220)	(0.887)

*** p < 0.01 (2-tailed)
** p < 0.05 (2-tailed)
* p < 0.1 (2-tailed)

Quantile regression coefficients show a statistical significance and growing impact of female CEO starting from quantile 45, with two exceptions: quantile 70 and quantile 75 (Fig. 2). The effect mildly exceeds the 95% confidence level in most of these quantiles, and mildly trails it in the two aforementioned quantiles, still showing a generally growing impact in higher quantiles. We can explain these results with the stronger impact of a female CEO on financial decisions within the company board.

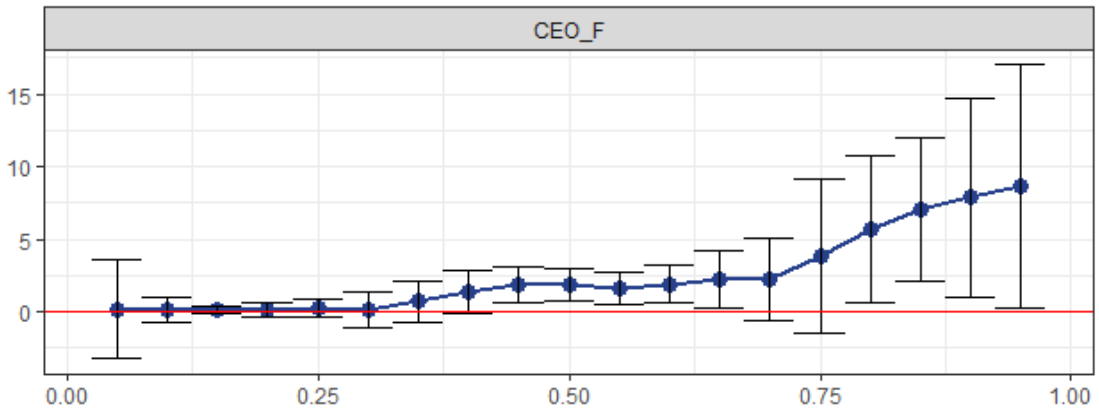

Figure 2 ROA and female CEO in quantiles

Note: Graphs of quantile regression are depicted with at least 3 significant coefficients of independent variables at a 95% confidence level.

There is no significant effect of having a female CEO or percentage of women on the board on ROE in any of the quantiles (Table 6). The effect of any women on the board is to some extent unstable, but in three of the five quantiles it is negative, reaching the highest significance in quantile 75 ($p<0.01$) and a marginally significant effect in quantile 25 and quantile 90 ($p<0.1$). Also, control variables have an effect on ROE. Interestingly, the effect is strongest and negative with board size, growing in higher quantiles and stable ($p<0.01$) in all quantiles except quantile 10. Number of employees only has a significant and negative effect in quantile 25 and quantile 50 ($p>0.01$).

Table 6 Quantile regressions (ROE) in the 25th, 50th, and 75th quantiles

	ROE				
Variables	Q(10)	Q(25)	Q(50)	Q(75)	Q(90)
Female CEO	-1.136	-1.740	-1.559	-5.788	-16.103
	(6.277)	(1.870)	(2.052)	(3.522)	(10.696)
Women % on the board	3.619	4.285	1.192	8.740	17.329
	(10.892)	(2.961)	(4.292)	(6.242)	(25.370)
Any women on the board	-1.383	-4.540*	-6.108	-18.980***	-42.471*
	(10.609)	(2.643)	(4.115)	(5.070)	(24.127)
Blau index	8.872	8.738**	11.677*	39.074***	105.030***
	(15.346)	(3.834)	(6.669)	(11.518)	(38.175)
Number of employees	-0.0003	-0.001***	-0.002***	-0.002	-0.004
	(0.001)	(0.0003)	(0.0004)	(0.002)	(0.005)
Board size	-1.235	-1.489***	-3.126***	-6.090***	-11.905***
	(1.176)	(0.356)	(0.282)	(0.627)	(2.551)

*** p < 0.01 (2-tailed)
** p < 0.05 (2-tailed)
* p < 0.1 (2-tailed)

However, the Blau index has a positive and significant effect in 4 out of the 5 quantiles analysed, exhibiting an increasing effect with increasing quantiles. The effect is most stable in the highest quantiles ($p<0.01$). The impact of the Blau index on ROE shows a significant and generally growing tendency from quantile 65 up to quantile 80, with the trend reversing in the highest quantiles (Fig. 3). The results demonstrate that the effect of board gender diversity is higher for better performing firms. We can see, on the one hand, that an organization's ability to effectively utilize women's unique capabilities, experiences and knowledge is stronger at high-performing companies, which goes in line with previous research (Conyon and He, 2017). On the other hand, we can make the conclusion, regarding the positive effect of gender diversity on higher financial performance, that it comes through the more objective and well-discussed decisions on boards when all board members have the opportunity to share their own opinions and then find the best solution for the organization (Miller and Triana, 2009; Nielsen and Huse, 2010; Post and Byron, 2015).

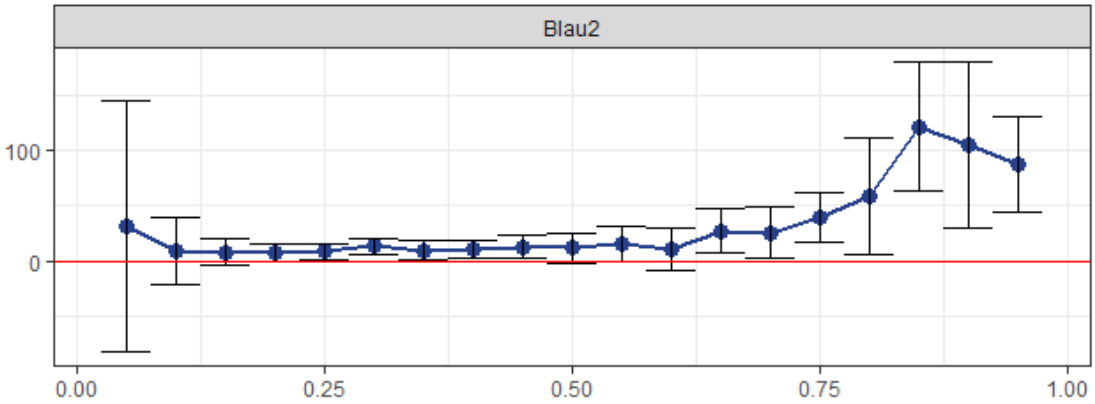

Figure 3 ROE and the Blau index

Note: Graphs of quantile regression are depicted with at least 3 significant coefficients of independent variables at a 95% confidence level.

To summarize, our empirical findings demonstrate that the impact of women on boards differs with the dispersion of firm performance. The results support Hypothesis 2, that the Blau index – the degree of heterogeneity among board members with respect to gender – is positively related to the financial performance of the firm and is higher in organizations with better financial results.

DISCUSSION

Understanding how executive board gender diversity affects organizational performance is becoming more and more topical with the increasing number of female executives in C-suites globally. Most previous research used data from the US, the UK, China, and highly developed European countries like Norway, Spain, Switzerland, Denmark, Sweden, and Italy, and a large part of these countries has implemented gender quotas on corporate boards. The present research is based on data from a region poorly represented in academic literature: Central and Eastern Europe (CEE). As the European Commission (2018) identified, more than 40% of Europeans see the role of a woman as taking care of her home and family, and these Europeans come from countries of the CEE region. It is important to bring Latvia, a country without legal quotas for women in management – and with a traditional understanding of women's role in society, the family, and professional life – to the international research agenda. The current study, to our best knowledge, is the first in Latvia to measure the impact of gender diversity on boards on the financial performance of business organizations. It is also the first that draws attention to the effect of gender diversity on boards in high-performing firms.

Previous research regarding the gender diversity impact on financial performance was mostly designed to look at the direct overall impact on accounting-based measures such as ROA and ROE, as well as market-based measures such as Tobin's Q. But when we developed our second hypothesis, we grounded our assumptions on the specific direction in scientific research where various authors have noticed that gender diversity's impact on financial performance may depend on performance dispersion and started looking at differences in this impact in high-performing and low-performing

firms. Our findings bring additional value to previous studies that discovered the positive influence of women on boards on financial performance in organizations measured by ROA and ROE (Habash and Abuzarour, 2022; Arvanitis et al., 2022; Bennouri et al., 2018; Green and Homroy, 2018; Reguera-Alvarado et al., 2017; Post and Byron, 2015; Mahadeo et al., 2012; Lückerath-Rovers, 2013 Carter et al., 2010). We provide evidence of a positive impact of gender diversity on boards measured by the Blau index on ROE, indicating that it appears starting from quantile 25 and becomes stronger in organizations with higher financial performance. We demonstrate that the effect of board gender diversity is quantitatively higher for better performing companies compared to worse performing companies. The results of the current study go in line with previous research findings that discovered a similar effect (Conyon and He, 2017; Pandey et al., 2022; Duppati et al., 2020; Habash and Abuzarour, 2022; Slama et al., 2019).

This study supports an understanding of the more complicated nature of relationships between women on boards and financial results and gives us the opportunity to conclude that the effect of gender diversity is not constant in all organizations, but differs and increases, based on an increasing level of financial performance. The results of our study support threat-rigidity theory as used by Triana et al. (2014). Threat-rigidity theory suggests that when a firm is threatened with some negative factors, it will typically restrict information exchange and centralize power in an organization in order to make decisions more easily and quickly (Staw et al., 1981). Our findings may be explained with the argument that the unique knowledge, perspectives and experiences of women are less likely to be used at low-performing companies as a result of negative changes in group dynamics that reduce women's contribution to boards' financial decisions (Conyon and He, 2017). Our study supports the idea that a company's capability to realize and utilize different genders' talents differs at low and high-performing firms, leading to a differential impact of board gender diversity on firm performance.

Additionally, we discovered the positive impact of a female CEO on organization financial performance, measured by ROA in high-performing organizations, which grows together with the firm financial performance level. A female CEO's positive impact appears in large firms with a higher number of employees and larger boards, which may be explained by a real opportunity for the female CEO to be heard and to have a real impact on the decision-making process, as well as a more developed level of corporate governance: fairer, more transparent and more structured processes in decision-making. It is important to interpret the results of our study in the broader context of the Latvian economy and the level of development of corporate governance in business organizations. In Latvia, there are no legal quotas for women's representativeness on boards, but there is a widespread bias regarding women's social role as caring for families and not being strong and rational business leaders. As a result, in 2020 women took only 10.63% of all CEO positions in the top 500 Latvian business organizations. Our findings regarding female CEOs' impact on organizations' successful performance go in line with some previous research. Mersland and Strom (2009), based on a sample from 60 countries and analysing different CEO characteristics, found that financial performance in organizations improves with the arrival of a female CEO. Similar findings were provided by Ullah et al. (2019), with the additional perspective that female CEOs not only improve an organization's financial performance, but also increase a firm's value. Davis et al. (2010) contributed to this discussion with the findings that female CEOs have significant effects on market performance (growth) and financial performance (profitability) and that female-led firms perform significantly

better due to their stronger market orientation relative to those led by males. Martin-Ugedo et al. (2018) also agree with the previous authors, maintaining that the presence of a female CEO increases ROA and ROE, and companies whose CEO is a woman have a lower debt ratio and lower degree of financial leverage. Han et al. (2019) also identified that female CEOs have promoted corporate incremental innovations and create a more open company climate and that female executives are more aligned with shareholders' financial interest (Farzan et al., 2020; Datta et al., 2021).

CONCLUSIONS

The paper was written with **the purpose** to examine the relationship between the presence of women on boards of the top 500 Latvian companies and accounting-based measures of company financial performance (ROA and ROE) and to understand the moderating effect of firm performance level in these relationships. The research gap regarding the influence of gender diversity on boards on the financial aspect of organizational performance in the Central and Eastern European region has been reduced by this study. We made an attempt **to contribute to the debate** on the role of gender diversity on corporate boards and support the opinion that it does have an impact on organizations' financial performance.

The independent variables of board diversity were used from four different perspectives: any women on the board, the proportion of women on the board, the Blau index and female CEO. We used the Blau index because proportion alone and the presence of only one woman on the board will result in homogeneity rather than heterogeneity.

In our study, we did not find acceptance of *Hypothesis 1*, regarding the impact of gender diversity on boards on average financial performance, since our findings were inconclusive: some were positive (impact of female CEO on ROA), some were negative (impact of any women on the board on ROE), and others were neutral, without statistical significance.

Further, we analysed the financial performance distribution effect. In order to understand the difference in gender diversity's impact for firms with higher and lower financial performance results, we **used quantile regression analysis**. We found confirmation of our prediction in *Hypothesis 2* that gender diversity in the boardroom positively affects financial performance (measured by ROE) in high-performing organizations. Additionally, our study demonstrated that a positive effect on financial performance (measured by ROA) in high-performing organizations exists in case the organization has a female CEO. We conclude **that there is no linear correlation between gender diversity and financial performance, however positive effect becomes evident in the companies, which demonstrate better financial performance.**

As a **limitation** of our research, we can mention that our data sample provides only a short-term perspective of three years and it would be beneficial to analyse data from a long-term perspective. Also, in this paper, we did not resolve the problem of endogeneity, and a more complicated empirical strategy, which would include this factor, would be recommended for future research.

The **practical implication** of our study lies in a clear understanding that including women on boards is not only an ethical issue. Certainly, high corporate ethical standards include promoting equal rights and partnerships between different societal groups, but women on boards also bring true financial

value to an organization when they take part in business leadership and strategic financial decision-making. The new EU regulation requiring gender parity on corporate boards was formally adopted by the European Parliament in 2022, making it relevant for Latvia as well. Companies must have 33% underrepresented genders among all directors or 40% underrepresented genders among non-executive directors by 2026. And even if quotas for women's inclusion in boards are not stipulated for unlisted companies in Latvia, organizations may wish to amend recruitment policies for their boards and actively invite external and internal female candidates to take part in the recruitment process.

Increasing the involvement of women in decision-making is crucial for enhancing societal wellbeing. Women's involvement in politics and corporate leadership leads to a greater grasp of societal issues and higher-quality discussion of matters that need to be decided.

It seems that not only financial performance characterizes an organization's effective performance, but that there are other aspects that characterise organizational success. It is impossible to attribute a company's performance solely to the existence of women on boards without analysing additional, moderating factors that create a framework for the successful utilization of women's diverse talents within organizations' boards. Therefore, **for further research**, we suggest continuing the analysis of different perspectives and values that women on boards bring to organizational performance based on Latvian data. It would be valuable to get data not only for 3, but for 5 years; that may make conclusions more objective. It would be beneficial not only to analyse the impact on financial performance with accounting-based measurements, but also to analyse the impact on financial risks (volatility and others), which is very important for organizations' long-term performance. Analysis of gender diversity's impact on non-financial performance, such as corporate governance and social responsibility, could lead to a wider understanding of the full scope of value that women on boards bring to an organization. We recommend not limiting the impact of gender diversity to different performance indicators, but continuing to strive for an understanding of boards', organizations' and women's characteristics that may create a welcoming attitude toward women joining boards and thinking of mechanisms to support women so that they can make a full contribution to organizations' successful performance.

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About authors

Irina Sennikova is Professor and Member of the Board at RISEBA University of Applied Sciences. She holds an MA degree in English philology from the University of Latvia, MBA and MSc in Management from IEDC-Bled School of Management (Slovenia), and PhD from Kozminski University (Poland). Irina **teaches courses in management,** leadership and organizational behavior at RISEBA. She also is a visiting lecturer at the Baltic Defense College (Estonia). Her research interests lie mainly in the area of intellectual entrepreneurship and entrepreneurial leadership. E-mail: Irina.sennikova@riseba.lv, ORCID: https://orcid.org/0000-0001-6005-3946

Olga Dzene is a PhD candidate at RISEBA University of Applied Sciences; "TRIVIUMS apmaciba" Leadership development expert, consultant, coach and coach with 20 years of experience in the fields of personnel and organization management. E-mail: olga.dzene@gmail.com, ORCID: https://orcid.org/0000-0002-8580-2656

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