

# The effect of gender diversity on the financial performance of firms: Evidence from the AEX

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## ABSTRACT

The current business landscape has warranted plentiful studies that explore the relationship between gender diversity on boards and firms' financial performance. Yet, the diverse conclusions from these studies are as plentiful as the studies themselves. This paper expands on the existing research by investigating the effect of gender diversity on boards on financial performance of AEX-listed firms. The study analyses the firms for a period of 2013 until 2023, using regression analysis to find a relationship. The study equips both an accounting-based measure (ROE) and a market-based measure (Tobin's Q) in its analysis. The findings reveal mixed results for the sample of 25 firms from the AEX index. The accounting-based measure reveals a significantly positive relation, while the market-based measure reveals no significant relation. Gender quotas that mandate a higher percentage of women on boards are approaching in the Netherlands. This study offers insights into the effects that these gender quotas can have. The mixed and inconclusive results warrant further investigation into the effects gender diversity has on firm performance.

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## Keywords

Female Directors

Corporate governance

Firm performance

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## 1. INTRODUCTION

In the recent years, there has been a growing discussion about the importance of gender diversity in boards of directors. According to statistics released by the European Institute for Gender Equality, women are generally underrepresented in corporate boardrooms all over Europe. To fight this, governments and regulatory bodies enforce gender quotas to ensure more female representation in boardrooms. Companies that fail to conform to these quotas often face punishment (Marchini et al., 2021).

In November of 2022, the European Union's directive on improving the gender balance among directors of listed companies and related measures, also known as the "Women on Boards" directive (EU DIRECTIVE 2022/2381) became active. Meaning that from that point on, all stock-listed companies in the EU, apart from SMEs, would have to work towards gender balance in their board of directors. To achieve this gender balance, the directive introduces mandatory gender quotas. The boards must be at least 40% female when only looking at non-executive directors while it must be 33,33% female when looking at both executive and non-executive directors. This will have major implications on the gender diversity in European boards. Statistics show that gender quotas have a positive effect on the percentage of women elected on boards (Franceschet et al., 2012).

The opinion on whether these gender quotas have a direct positive effect on the firm's performance remains inconclusive and mixed. Some scholars argue that the quotas encourage more diverse perspectives in decision-making and innovation in the firm (Liu et al., 2014). While others say that the gender quotas might lead to the selection of "token"-women on the board, which might lead to underqualified board members and deteriorating boardroom cohesion (Putnam, 2007).

The "Women on Boards" directive mandates that by June of 2026, the companies' boards must conform to the set gender quotas. This makes gender quotas in European boards a topical subject. In the Netherlands, a similar initiative called the Dutch Diversity Act is being enforced since 2022. The "wet ingroeiquotum en streefcijfers" as it is officially known, mandates that large companies in the Netherlands need to start reporting their efforts towards equality in 2023. Given the inconclusive findings on the effects of gender diversity on firm performance and the upcoming pressure to further diversify boards, there is a continued need for more evidence on firms listed on the Dutch exchange. Therefore, I will be investigating the research question: "*What are the effects of gender diversity on the financial performance of AEX-listed companies?*"

The objective of this research question is to provide further insight on the effects that gender diversity on boards has on the firm's financial performance. This is relevant because of the upcoming legislation in the Netherlands, mandating large firms to report their gender diversity initiatives.

I will answer the research question using the following sub questions.

- "How has gender diversity on boards of AEX-listed companies evolved over the recent years?"
- "Is there a relation between gender diversity on boards and firm performance in AEX-listed companies?"

## 2. LITERATURE REVIEW

In this literature review I will review the existing literature on gender diversity and its effects on financial performance. I will

be doing this by reviewing agency theory, social identity theory and resource dependency theory and what various sources say about the possible effects gender diversity can have on financial performance. I will also shortly be going over the institutional background of Dutch boards.

### 2.1 AGENCY THEORY

According to an a study by Gul et al. (2011) gender diversity on corporate boards leads to higher transparency. The higher transparency in turn, leads to better firm performance by solving agency problems (Fung, 2014). Agency problems stem from the agency theory. Agency theory talks about the relationship between an agent, which is mostly management and a principal, which is the ownership or the shareholders. In this relationship, the principal delegates their decision making to the agent. The board comes in to make sure that the interests of the principal, the shareholders, are protected. Kang et al. (2007) argue that to protect shareholder interests, the board should reflect the shareholders. Since the shareholders are not homogeneous, the board should not be homogeneous either. The board should mimic the diversity of the shareholders to effectively protect shareholder interests. According to literature in the light of agency theory, gender diversity should have of positive effect on the firm's market performance.

### 2.2 SOCIAL IDENTITY THEORY

Research by Tajfel and Turner (1979) suggests that individuals get their identity and confidence from their group memberships, leading to the categorization of people into ingroups and outgroups. In the context of corporate boards, gender diversity can shape perceptions of ingroup and outgroup identities, affecting collaboration, decision-making, and organizational outcomes. According to Markóczy et al. (2019) diversity in boards leads to the division of males and females into groups, which hurts boardroom cohesion in the long run. Ben-Amar et al. (2013) states that a balance must be found between the cohesion and gender diversity on the board to ensure firm performance. According to literature in the light of social identity theory, gender diversity should have a slightly negative correlation.

### 2.3 RESOURCE DEPENDENCE THEORY

Resource dependence theory (RDT) offers a perspective on relations between organizational resource dependencies and gender diversity on corporate boards. According to RDT, organizations rely on external resources from various stakeholders to achieve their goals, and the management of these dependencies can influence organizational behavior and performance (Pfeffer & Salancik, 1978). According to Erhardt et al. (2003) gender-diverse boards are better at allocation and acquisition of said resources. Gender diversity is also argued to hurt a firm's resource management, bad board cohesion caused by board diversity might hurt the board's decision-making (Ben-Amar et al., 2013). According to literature in the light of resource dependence theory, the correlation between gender diversity and firm performance is mixed and inconclusive.

### 2.4 FIRM PERFORMANCE AND GENDER DIVERSITY

Several studies have examined the impact of gender diversity on board effectiveness and firm performance, with mixed findings. Studies have found positive associations between

gender-diverse boards and performance (Adams & Ferreira, 2009). Fagan et al. (2012) states that the correlation between the variables leans towards a slightly positive relationship, while also acknowledging that there is a lot of inconclusive data on the subject and even data that shows no relation at all.

## 2.5 INSTITUTIONAL BACKGROUND OF THE NETHERLANDS

The Netherlands has a corporate governance model with a two-tiered board structure. Unlike the Anglo-American model, the Dutch model separates executive and supervisory functions into two separate boards. The management or executive board and the supervisory board (De Jong et al., 2011).

The management or executive board is comprised of executive directors that are responsible for day-to-day management and operations of the company. The management board reports to both the shareholders and supervisory board (Van der Elst & Van Gerven, 2004).

The supervisory board advises, oversees, and monitors the management board. In an effort to make the company operate in line with legal and ethical standards, to protect stakeholder interests and to protect corporate governance principles. The members of this supervisory board are called commissioners and are often independent directors (Enriques & Gelter, 2010).

The Dutch have several motivations to apply this model in the real world. Firstly, the model provides stakeholder representation. The supervisory board often consists of members of different stakeholder groups, which helps with bringing in a range of different perspectives for decision-making (Kahan & Rock, 2007). Secondly, this model separates executive and supervisory functions into separate bodies which improves the corporate governance. It reduces risks of conflicts of interests and self-monitoring (De Jong et al., 2011).

However, it is important to note that not all firms in the AEX will implement this model since not all firms are native to the Netherlands.

Firms that do not equip the two-tier model will likely be implementing an Anglo-American board model, where the board only has one tier. This one board houses both executive and non-executive members. This board picks up both the supervisory and management responsibilities. The main advantage of this model as opposed to the one tier model is the fast decision-making the Anglo-American model provides (Jungmann, 2006).

## 3. HYPOTHESES

In this paragraph I will go over the relevant hypotheses of the question: "Is there a relation between gender diversity on boards and firm performance in AEX-listed companies?" This is because I will empirically test the hypotheses for this question. I will base my hypotheses on the literature review.

**Hypothesis 1: There is no significant relation between gender diversity and the companies' financial performance.**

Using Fagan et al. (2012) we can argue that the data on the correlation between gender diversity on boards and firm remains inconclusive. When arguing from the Resource Dependence Theory we also find contradicting findings, which can lead to an inconclusive and thus not significant relation.

**Hypothesis 2: There is a significant positive relation between gender diversity and the companies' financial performance.**

Arguing from Agency Theory, there should be a positive relation between gender diversity and financial performance.

Adams and Ferreira (2009) also find a positive relation between the two variables.

**Hypothesis 3: There is a significant negative relation between gender diversity and the companies' financial performance.**

We can use the studies on Social Identity Theory to argue that gender diversity on boards can lead to a worsened financial performance. The Social Identity Theory predicts a negative relation between gender diversity and financial performance.

## 4. METHODOLOGY

To investigate the effect that gender diversity has on financial performance of these AEX-listed companies I will be performing a regression analysis. The purpose of this regression analysis is to show whether there is any correlation between the independent and dependent variable and if so if this correlation is strong or weak and negative or positive. This will yield quantitative data which will be used to draw conclusions.

### 4.1 SAMPLE

The sample of the research is the twenty-five companies listed on the AEX on the 23<sup>rd</sup> of March 2024. The AEX is comprised of the 25 most actively traded companies listed on the Euronext Amsterdam. The companies are listed in Appendix 2. The sample period for the research is between 2013 and 2023, measured yearly. Data collected before 2013 was often incomplete, with data of boards consisting of only one or two board members, giving a skewed image of board compositions.

### 4.2 VARIABLES

In this paragraph I will define the variables I will use in this research. The dependent variables in this research are the Tobin's Q and the Return on Equity of the firm. ROE will be measured by taking net income and dividing by shareholders' equity. The independent variable is the gender diversity in the boards of these firms. This will be measured as the percentage of women on the board. The control variables for this research will be total assets, to represent firm size, along with firm age and leverage. Total assets of the firm are the amount of outstanding shares times the share price. The control variables are used in this research to give a more complete understanding of the possible causal relationship between the independent and the dependent variable. Financial data and data on the percentage of women on the boards will be sourced from Refinitiv Eikon.

### 4.3 SUMMARY STATISTICS

To provide an overview of the key characteristics of the data, a summary statistics table. To show the central tendency, the table will show the mean and median of the variables. To show variability in the data, the table will show the range and standard deviation of the variables.

The summary statistics table will show the variables: FSIZE, ROE, TOBQ, % FEMALE, LEV and FAGE.

## 4.4 REGRESSION MODEL

As previously said, this research will be using regression analysis to examine the relationship between gender diversity and market performance and accounting performance, using total assets, leverage and firm age as control variables. The regression equations are the following.

$$ROE_{it} = \beta_0 + \beta_1 \text{Gender diversity}_{it} + \beta_2 \text{Firm size}_{it} + \beta_3 \text{Leverage}_{it} + \beta_4 \text{Firm Age}_{it} + \varepsilon_{it}$$

$$TQR_{it} = \beta_0 + \beta_1 \text{Gender diversity}_{it} + \beta_2 \text{Firm size}_{it} + \beta_3 \text{Leverage}_{it} + \beta_4 \text{Firm Age}_{it} + \varepsilon_{it}$$

With  $\beta_0$  being the intercept and  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$  and  $\beta_4$  being the regression coefficients of gender diversity, firm size, firm age, and leverage, respectively.  $\varepsilon$  stands for the error, which means the unexplained variance in the share returns of the firms. TQR in the second regression equation stands for Tobin's Q Ratio. This regression model will be put into R and give us a value that will be tested against the alpha of 0.01. This will give us information on the correlation between the variables, if there is any. The alpha of 0.01 has been chosen to reduce the risk of Type 1 Errors and to make the results more reliable.

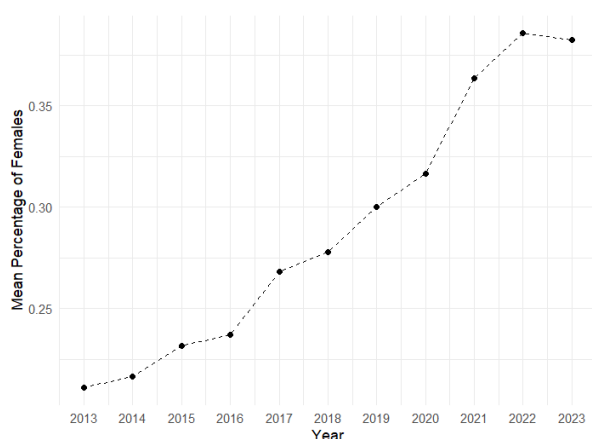
## 4.5 DATA COLLECTION

Data will be collected from Refinitiv Eikon. The raw data will be imported into excel where it will be cleaned, sorted, and used to calculate more complex variables like the ROE and the TQR. The data will be collected from a period of 2013 until 2023 to give an accurate idea of the changes in gender diversity and firm performance over the years.

## 5. DATA DESCRIPTION

### 5.1 FEMALES ON BOARDS

Figure 1 shows the mean percentage of women on boards of the selected AEX-listed companies between 2013 and 2023. It presents a positive curve, showing that on average, the percentage of women on boards grew for the sample period. The growth starts with the period 2013 to 2016 where the average growth is 0,8%. The mean percentage then spikes in 2016 to 2017, with a growth of 3,1%.



**Figure 1 Average percentage of women on boards over time**

The graph eventually peaks in 2022 after another sharp growth of 4,7% from 2021 to 2022. After the peak in 2022 the mean goes down by 0,3% in 2023. This suggests that the curve has

flattened. This is odd considering that the Dutch Diversity Act, an initiative with the intent of increasing female participation in Dutch boards is being enforced since 2022.

Summarized, Figure 1 showcases an upward curve of the percentage of females on corporate boards over the years from 21,1% to 38,5% that eventually flattens in the year 2022.

## 5.2 SUMMARY STATISTICS.

Table 1 shows the summary statistics for the main variables of the analysis. Appendix Table A1 defines the variables with sources to these definitions. Next to the mean, the standard deviation, minimum value, median and maximum value are given to give a clearer image of the distribution of the data.

The summary statistics table shows us that the average percentage of women on boards in the sample is 29,2%. This means that women are still in the minority in most cases. We can also look at the median to show us that 50% of the boards in the sample are made up of less than 30% women. When looking at the ROE we can see that the average company in our sample returns 17.4% on their equity. The summary statistics also show us that with a mean Tobin's Q ratio of the sample is 0.991. This means that the stock of AEX-listed firms is on average slightly undervalued. The summary statistics of the ROE and TOBQ show us that AEX-listed firms on average have a strong financial performance, however the Min and Max show us that there are also outliers. The median on TOBQ also shows us that 50% of the sample is higher than 0.999, and a TOBQ of 1 means that the firm is accurately valued.

The firm size data is highly dispersed with a mean of 128531 and a standard deviation of almost double the mean. The range is also very big, ranging from 340.710 to 1178657. This shows us that there is a wide variety of firm sizes between the AEX-listed companies. Firm age ranges from 7 years old all the way up to 159 years old, with a mean age of 48.746 years old. The median 31 years old, suggests in combination with the Min and Max that the distribution of FAGE is right skewed. When looking at leverage we again find a variable with high dispersion, because the standard deviation is higher than the mean. We find a mean leverage of 1.210, meaning the firms in the sample are on average more financed by debt than by equity. When we look at the median it gives us a different picture. The median of 0.620 shows us that 50% of the sample has a leverage under 0.620 and thus we can assume that the majority of the sample is financed more by equity than by debt. The Min of 0.000 even shows us that there is at least one company in the sample that is financed completely by equity and or capital.

Overall, the data in the Summary Statistics table show us the varying characteristics and gives us a reasonable look into the distribution of the data.

### 5.3 CORRELATION MATRIX

Table 2 shows us the correlation between the main variables in this study. When looking at the highest and lowest values we find -0.308 and 0.288. This suggests that there are no strong relationships in our correlation matrix. We see a correlation between % Female and ROE of 0.127 and a correlation between % Female and TOBQ of -0.058. This tells us that gender diversity is slightly positively related to ROE and that gender diversity is very slightly negatively related to TOBQ.

The correlation matrix shows multiple positive and negative relations between the variables, two of which I would like to highlight. Firstly, FSIZE is negatively correlated with ROE,

meaning the bigger the firm, the less return they get on equity. This can then be explained by showing the positive correlation between FSIZE and LEV, which means that bigger firms tend to finance more debt than equity.

In summary, the correlation matrix gives us great insight into the relations between the variables in this study. The percentage of females is negatively related to the TOBQ and positively related to all the other variables in the correlation matrix.

**Table 1 Summary Statistics**

Variable	N	Mean	S.D.	Min	Median	Max
FSIZE	247	128531	222898	340.710	31580	1178657
ROE	247	0.174	0.163	-0.314	0.132	0.822
TOBQ	247	0.991	0.025	0.840	0.999	1.092
% FEMALE	252	0.292	0.118	0.000	0.300	0.556
LEV	247	1.210	1.297	0.000	0.620	8.0313
FAGE	252	48.746	38.515	7	31	159

Notes: This table shows the summary statistics for the main variables used in this study. The definitions for the variables can be found in Appendix Table 1.

**Table 2 Correlation Matrix**

		1	2	3	4	5	6
1	FSIZE	1.000					
2	ROE	-0.308	1.000				
3	TOBQ	-0.156	0.055	1.000			
4	% FEMALE	0.118	0.127	-0.058	1.000		
5	LEV	0.288	0.039	-0.131	0.217	1.000	
6	FAGE	-0.026	-0.078	-0.350	0.195	0.035	1.000

Notes: This table shows the correlation matrix for the main variables used in this study. The definitions for variables can be found in Appendix Table 1.

### 6. REGRESSION RESULTS

Table 3 shows the regression results for the regression on both the market and accounting-based measures of financial performance of the firm. I will be going over the regression results for both, starting with the accounting-based measure, ROE, and ending with the market-based measure TOBQ.

The regression results for ROE suggest several significant relationships. The constant term, or intercept, is 0.189 and is statistically significant at the 1% level, this suggests a baseline ROE of 0.189 when all other variables are held at 0. The variable % Female shows a positive relationship with ROE, with a coefficient of 0.301, and is significant at the 1% level. This means that an increase in the percentage of women on the

board is associated with a higher ROE. This implies that having more women on a board, helps financial performance.

This supports hypothesis 2, contradicting hypotheses 1 and 3. Adams and Ferreira (2009) also state a positive relation between gender diversity and firm performance. The regression results of ROE support the study done by Adams and Ferreira (2009).

FSIZE is negatively related to ROE, with -0.000 and is significant at the 1% level, this suggests that bigger firms tend to have lower ROE. Similarly, FAGE has a negative relationship with ROE, with -0.001, and is significant at the 5% level. This suggests that older firms tend to have lower ROE.

Leverage (LEV) is positively related to ROE, with 0.012, and is significant at the 5% level, this suggests that firms with higher leverage usually have a higher ROE.

The model has 247 observations and has an R<sup>2</sup> of 0.151, meaning that approximately 15.1% of the variance in ROE is explained by the model. The adjusted R<sup>2</sup> is slightly lower at 0.133. The residual standard error is 0.151 with 241 degrees of freedom. The F-statistic is 8.557, significant at the 1% level, indicating that the overall model is statistically significant.

The regression results for TOBQ also reveal several significant relationships. The constant term is 1.003 and is statistically significant at the 1% level, indicating a baseline TOBQ of 1.003 when all other variables are 0. The variable % Female has a positive coefficient of 0.010 but is not statistically significant, suggesting no strong evidence that the percentage of female representation on the board has an effect on TOBQ.

This supports hypothesis 1, contradicting hypotheses 2 and 3. Fagan et al. (2012) already stated that there are results that

show no relation at all. The regression results of TOBQ support the study done by Fagan et al. (2012).

FSIZE has a positive relationship with TOBQ, with a coefficient of 0.000 and is significant at the 1% level, this suggests that larger firms usually have higher TOBQ. FAGE shows a negative relationship with TOBQ, with -0.0002 and is significant at the 1% level. This means that older firms usually have a lower TOBQ.

LEV is negatively related to TOBQ, with a coefficient of -0.003 and is significant at the 1% level, suggesting that firms with higher leverage tend to have lower TOBQ. The model includes 247 observations and has an R<sup>2</sup> of 0.183, meaning that approximately 18.3% of the variance in TOBQ is explained by the model. The adjusted R<sup>2</sup> is slightly lower at 0.166. The residual standard error is 0.023 with 241 degrees of freedom. The F-statistic is 10.817, significant at the 1% level, indicating that the overall model is statistically significant.

**Table 3 Regression Results**

	ROE (1)	TOBQ (2)
Constant	0.189*** (0.043)	1.003*** (0.006)
% FEMALE	0.301*** (0.103)	0.010 (0.016)
FSIZE	-0.000*** (0.000)	0.000*** (0.000)
FAGE	-0.001* (0.000)	-0.000*** (0.000)
LEV	0.012* (0.007)	-0.003*** (0.001)
Observations	247	247
R <sup>2</sup>	0.151	0.183
Adjusted R <sup>2</sup>	0.133	0.166
Residual Std. Error (df = 241)	0.151	0.023
F Statistic (df = 5; 241)	8.557***	10.817***

Notes: Definitions for variables can be found in Appendix Table 1.

\* \*\* \*\*\* p<0.01

## 7. CONCLUSION

The aim of the study is to give a better understanding of the effect of gender diversity on the financial performance of Dutch firms. The Netherlands implemented a gender quota with “de wet ingroeiquotum en streefcijfers” which mandates companies of a certain size to report their gender diversity efforts from the summer of 2023 onwards. Therefore, investigating the effects of this gender diversity on a firm’s financial performance is relevant in practice.

The research investigates two measures of financial performance, a market-based measure, and an accounting-based measure. The market-based measure is Tobin’s Q, and the accounting-based measure is Return on Equity. For the market-based measure, the results show a significant positive relation between Tobin’s Q and the percentage of females on a board. This suggests that firms with a higher percentage of females on their boards tend to have a higher Tobin’s Q. The market-based measure tells us to accept hypothesis 2. For the accounting-based measure, the results do not show a significant relationship between the percentage of females on a board and Return on Equity. This suggests that there is no significant difference in financial performance between a firm with a low percentage of females and a firm with a high percentage of females. This is in line with Fagan et al. (2012) who also report an inconclusive relationship. The accounting-based measure supports hypothesis 1.

The empirical evidence from this study aims to help understand the effects of gender diversity on a firm’s financial performance. The research provides no clear answer on the effects of gender diversity on financial performance. In practice, the relation between gender diversity on boards and firms’ financial performance should be investigated further.

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## 10. APPENDICES

### 10.1 Appendix 1:

**Appendix Table 1 Definitions of variables with sources**

Variable	Definition	Source
%FEMALE	Number of women directors divided by the total number of directors.	Carter et al (2003)
FSIZE	Total assets of the company in millions.	Campbell & Minguez-Vera (2008)
LEV	Total debt outstanding divided by the total assets.	Campbell & Minguez-Vera (2008)
FAGE	The amount of years since the company was founded.	Osunsan et al (2015)
TOBQ	Market value of assets divided by the replacement cost of assets.	Adams & Ferreira (2009)
ROE	Net Income divided by the shareholders equity.	Joecks et al (2012)

### 10.2 Appendix 2: List of AEX-listed Companies

1. ABN AMRO NV
2. Adyen NV
3. Aegon Ltd
4. Akzo Nobel NV
5. ArcelorMittal SA
6. ASM International NV
7. ASML Holding NV
8. ASR Nederland NV
9. BE Semiconductor Industries NV
10. DSM Firmenich AG
11. Exor NV
12. Heineken NV
13. IMCD NV
14. ING Groep NV
15. Koninklijke Ahold Delhaize NV
16. Koninklijke KPN NV
17. Koninklijke Philips NV
18. NN Group NV
19. Prosus NV
20. Randstad NV
21. Relx PLC
22. Shell PLC
23. Unilever PLC
24. Universal Music Group NV
25. Wolters Kluwer NV