Women are from Venus, Men are from Mars: But Do the Financial Markets Know It?

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Abstract

Although existing research has documented in very wide and detailed terms the impact of the presence of female directors on the financial performance of firms, very little is known about the link between board composition and corporate risk-taking. Drawing from the academic literature demonstrating that women are more risk averse than men, herein, we analyze the relationship between gender diversity and firm risk. In particular, we study whether the appointment of female directors affects firm risk level. We use three different measures of risk (total risk, systematic risk, and unsystematic risk) and compare firm risk level before the addition of new members (both male and female) to the corporate board to the risk level after such additions. Our results indicate that there is no significant gender difference in the risk level before and after the appointment of a director, when the whole sample is considered. However, some differences appear when the analysis is conducted by industry. Similarly, we show that the appointment of a female director has a greater impact on firm risk in female-director-friendly firm.

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1. Introduction

Because all of a firm's major strategic and financial decisions (including capital increases, mergers, acquisitions, or recruiting executives) must be approved by the Board of Directors, a firm's board plays a key role in corporate decision-making. Importantly, according to the academic literature, this decision-making process is significantly affected by the composition of the board. For instance, it has been argued that independent outside directors (Baysinger and Butler, 1985; Fama and Jensen, 1983), independent or dual board leadership (Brickley et al. 1997; Rechner and Dalton, 1989, 1991) board size (Jensen, 1993; Pearce and Zahra, 1992; Yermack, 1996) or board gender diversity (Adams et al., 2011; Francoeur et al., 2008; Matsa and Miller, 2013) can influence corporate outcome.

With regard to the latter point, most of the existing literature has focused on how female board members affect firm's financial performance so that very few studies have analyzed the link between gender board composition and firm risk-taking. However, many studies showed that women are more risk averse than men (Byrnes et al., 1999). Recently, it has even been suggested that an increased participation by women in decision-making would have made it possible to avoid the subprime financial crisis (Rhode and Packel, 2010). Thus, by restraining the boldness of male directors in highly risky ventures, female directors could reduce the excessive risk-taking of boards (Dowling and Ali Aribi, 2013). An increased presence of women in decision-making positions could affect the risk-tolerance of a firm and, consequently, its performance (Berger et al, 2012).

We supplement the existing literature on corporate governance by providing results on the link between gender board composition and firm risk-taking. To our knowledge, our study is the first one to directly address the impact of the appointment of female directors on the risk-taking of U.S. firms and to consider all S&P 100 firms. The remainder of this paper is organized as follows: Data and methodology are presented in Section 2. The empirical results are discussed in Section 3. Section 4 concludes.

2. Data and methodology

2.1 Sample

To carry out the study, all of the relevant proxy statements for each firm belonging to the S&P 100 index were obtained from the Securities and Exchange Commission website. In most of cases, the exact date of the appointment (day/month/year) was disclosed in the proxy statements. Where the date of appointment was not disclosed on the proxy statement, we obtained this information using Lexis Nexis, Thomson One Banker, and/or Bloomberg. In so doing, we were able to determine the exact composition of the 100 boards of directors and to follow the day-to-day changes between 1994 and 2010.

We have systematically excluded multiple appointments (when at least two directors whatever their gender were appointed on the same date) because of the empirical impossibility of isolating the impact of the individual directors. Although this greatly reduced the number of observations, it guaranteed a non-biased sample. We choose the S&P 100 Index, which is a sub-set of the S&P 500 index, because it measures the performance of large cap companies in the United States. Its constituents represent about 57% of the market capitalization of the S&P 500 and almost 45% of the market capitalization of the US equity markets.

We distinguished between the appointment of women and men, and, as one would expect, the number of male appointments was higher than the number of female appointments. Nevertheless, some substantial differences appear between industries. In general, we observed a higher percentage of female appointments for consumer discretionary, consumer staples, and health care firms but a lower percentage for energy and industrial firms. Our results are consistent with Harrigan (1981). However, two findings are particularly striking. First, we observed a high percentage of female appointments in information technology firms (23%). Generally, since information technology firms are seen as open and democratic firms, this could increase the likelihood of women breaking through the "glass ceiling." Second, our results indicate that the frequency of female appointments in financial firms is disproportionately low (12%). These results are contrary to those of Harrigan (1981), but could be explained by Del Prete and Stefani's (2013) negative correlation between risk-taking and the presence of women on boards. The drive for high yields in the short term is often a driving consideration for financial firms. Therefore, the fact that women are assumed to be more risk adverse could help explain why women are not preferred by financial firms.

2.2 Methodology

We examined the association between board gender diversity and firm risk level. More specifically, we analyzed how the appointment of a new board member (male or female) affected the firm risk level. We use three different measures of risk (total risk, systematic risk, and unsystematic risk) and compare firm risk level before the addition of new members (both male and female) to the corporate board to the risk level after such additions.

2.2.1 Total risk

If risk is defined as the chance of achieving returns lower than expected, it would be logical to measure risk by the dispersion of the possible returns below the expected value. A more specific measure of total variability of returns is the standard deviation of asset returns, where the total risk of an asset i over the period t is defined as follows:

$$\text{Total risk} = \sigma_{R_{i,t}}$$

Total Risk is made up of two types of investment risk: systematic and unsystematic risks. We may use the market model to quantify these risks:

$$\begin{aligned} R_{i,t} &= \beta R_{m,t} + \varepsilon_{i,t} \qquad \text{with} \qquad \varepsilon_{i,t} \sim N(0, \sigma^2_{\varepsilon_{i,t}}) \\ \sigma^2_{R_{i,t}} &= \beta^2 \sigma^2_{R_{m,t}} + \sigma^2_{\varepsilon_{i,t}} \end{aligned} \tag{1}$$

The model (1) describes the link between the return of an asset i ($R_{i,t}$) and the return of the market ($R_{m,t}$). As this model is a statistical model, we need to add an error term ($\varepsilon_{i,t}$). The total risk ($\sigma_{R_{i,t}}$) of the asset i may be broken in two parts: (i) the market risk which is called systematic risk ($\beta\sigma_{R_{m,t}}$) because it cannot be removed by diversification and (ii) the asset-specific risk which is called unsystematic risk ($\sigma_{\varepsilon_{i,t}}$) because it may be reduced by diversification.

2.2.2 Market risk

The type of risk that cannot be diversified away because it affects the market as a whole is called the market risk or systematic risk. This type of risk cannot be eliminated by combining individual securities in a well-diversified portfolio. Using the definition of the model (1), the market risk is equal to β times the standard deviation of the market return:

$$\text{Market risk} = \beta\sigma_{R_{m,t}} \tag{2}$$

where β indicates how sensitive the security return is to changes in the market level and $\sigma^2_{R_{m,t}}$ represents the variance of the market returns.

2.2.3 Diversifiable risk

The risk that disappears through diversification is called diversifiable risk. Using the definition of the model (1), the unsystematic risk is equal to the standard deviation of the residual return factor ε, or:

$$\text{Unsystematic risk} = \sigma_\varepsilon = \sigma_{R_{i,t}} - \beta\sigma_{R_{m,t}} \tag{3}$$

where $\sigma_{R_{i,t}}$ represents the standard deviation of the asset returns, β indicates how sensitive the security return is to changes in the market level and $\sigma_{R_{m,t}}$represents the standard deviation of the market returns.

Following the methodology of event study, we used a 65/130/195/260 day pre/post estimation window and a 21-day event window (-10, +10) with 0 representing the event day. Modifying the length of the estimation window allowed us to study the impact of an appointment on the firm's risk levels in the very short (65 days), short (130 days), medium (195 days) or long-term (260 days).
For each appointment, we compared the risk level before and after the appointment. More precisely, we computed the total risk $\sigma R_{i,t}$ for the firm i, t days before and after the appointment where t equals to 65, 130, 165 and 260. The market risk was computed as Equation (2) where the index market corresponds to the S&P 500 and the β is estimated out of estimation window. The unsystematic risk was computed as Equation (3). To conduct a comparative analysis, we tested for each type of risk the following hypotheses:

- Hypothesis 0 (H_0): *the risk level is the same before and after the appointment.*
- Hypothesis 1a (H_1^a): *the risk level before the appointment is higher than the risk level after the appointment.*
- Hypothesis 1b (H_1^b): *the risk level before the appointment is lower than the risk level after the appointment.*

To distinguish between the appointment of a man and a woman, we computed the number of times each (H_0, H_1^a and H_1^b) hypothesis was accepted. Then for each hypothesis, we applied a proportion test to evaluate the relation between gender and risk.

3. Empirical results

We first considered the whole sample, that is to say the 100 firms included in the S&P100 index. They indicate that there is no significant gender difference in the risk level before and after the appointment of a director whatever the length of the estimation window and the considered type of risk. Interestingly, we note that the impact of a director's appointment on the three types of risk increases as time goes by (since the frequency of H_1^a and H_1^b increases and the frequency of H_0 decreases with time). In other words, the impact of the appointment of a director on firm's risk (whether positive or negative) increases with time. This validates our decision to use different lengths of estimation windows and is consistent with the idea that the effects of a change in the board composition may be difficult to detect in the short-term. Moreover, in most of cases, the announcement of the appointment of a new director (male or female) had no impact on firm's systematic risk. This result implies that the increase in the firm's total risk after some appointment is only due to the firm's increase in the unsystematic risk. We noted that the positive impact on a firm's systematic risk, *i.e.* the fact that the risk is lower after the appointment, increased with time but that there were no significant differences between men and women. The results for the whole sample have to be studied with caution since they could conceal some effects specific to some industries or to firm characteristics.

As the inclusion of women at the strategic decision-making levels may not carry the same weight and importance for different industries, we decided to conduct the same analysis by industries. The results of the proportion tests for risk by industry offer some very interesting results. Concerning the impact on the total risk, consistent with the results obtained for the whole sample, we observed no distinction between the impact of female appointments and of male appointments in the very short term. However, we cannot dismiss completely the existence of a gender impact when a director is appointed if we consider the short, the medium or the long-term effects. Thus, the appointment of a woman more frequently decreases the total risk level for firms in the consumer discretionary industry (in the long-term), in the consumer staples and in others industries (in the medium-term), in the energy and in the health care industries (in the short-term) but more frequently increases the total risk level for industrial firms (in the medium-term).

Conversely, the appointment of a man increases the total risk level for firms in the consumer discretionary industry (in the long-term), for firms in other industries (in the medium-term), in the energy, the financial and the health care industries (in the short-term), information technologies firms (in the long-term), and financial firms (in the medium-term). Thus, the impact of a director's appointment on the total risk differs according to (*i*) the considered industry and (*ii*) the estimation window.

The results concerning the systematic risk show that a male appointment reduces more frequently the systematic risk than a female appointment for firms in the consumer discretionary industry (in the short-term), in the consumer staples industry (in the very short and in the long-term), in the health care industry and industrial firms (in the long-term). On the other hand, a female appointment has a more positive impact on firm systematic risk than a male appointment in the energy industry (in the medium-term), for financial firms (in the very short, medium and long-term) for firms in the information technologies industry and firms in other industries (in the short, medium and long-term).

Finally, our results indicate a gender effect on the unsystematic risk depending on firm's industry. The appointment of a male director more frequently increases the unsystematic risk than the appointment of a female director for firms in the consumer discretionary industry (in the medium term), for firms in the energy industry (in the short, medium and long term) and in the health care industry (in the very short, short, medium and long-term) and decrease

Table 1: Summary of results of proportion test by industry

	Positive impact	Negative impact
Female's appointment		
Total risk	Cons. Dis. (+) Cons. Staples (+) Energy (+) Health Care (+) Others (+)	Industrials (-)
Systematic risk	Energy (+) Financials (+++) Info. Tech. (+++) Others (+++)	
Unsystematic risk	Energy (+) Financials (+) Health Care (+++) Industrials (+)	Industrials (-) Cons. Staples (-) Others (-)
Male's appointment		
Total risk	Info. Tech. (+) Financials (+)	Cons. Dis. (-) Energy (-) Financials (-) Health Care (-) Others (-)
Systematic risk	Cons. Dis. (+) Cons. Staples (++) Health Care (+) Industrials (+)	
Unsystematic risk	Others (++)	Cons. Dis. (-) Energy (- - -) Health Care (- - - -)

(+), (++), (+++) and (++++) mean that the appointment has a significant positive impact for 1, 2, 3 or 4 out 4 event windows, respectively.
(-), (- -), (- - -) and (- - - -) mean that the appointment has a significant negative impact for 1, 2, 3 or 4 out 4 event windows, respectively.

more frequently the unsystematic risk than the appointment of a female director for firms in other industries (in the medium and long-term). Conversely, the impact female directors on the unsystematic risk is more frequently positive than the impact of male directors in the energy industry (in the medium-term), for financial firms (in the short-term) in the health care industry (in the short, medium and long-term) and more frequently negative for firms in other industries and in consumer staples industry (in the long-term). For industrial firms, in the medium-term, women have both more frequently a positive and a negative impact than men (which means that men have more frequently no significant impact on the unsystematic risk). Interestingly, we noted no differences between male and female appointments on firm unsystematic risk for firms in the information technologies.

Our significant results are summed up in Table 1. First, we can see from this table that female appointments more frequently have a significant positive impact on firms' risk than a significant negative impact. Thus, from this point of view, the appointment of female directors seems to be beneficial to shareholders particularly since the results for male appointments show less frequently a positive impact on firms' risk. Regarding total risk, a female presence on boards could be particularly beneficial in industries such as consumer discretionary, consumer staples, energy and in health care, while a male presence on boards would be beneficial to industries such as information technologies and financial firms. In general, these results are consistent with Daily et al. (1999), who argued that women play a key role in industries characterized by high levels of female buyers such as consumer products. However, we have to admit that we find only limited evidence of a positive impact since our results are significant only for 1 estimation window out of 4. Consistent with Daily et al. (1999), we noted a strong positive impact of female appointments (for 3 estimation windows out of 4) and a strong negative impact of male appointments (for 4 estimation windows out of 4) on unsystematic risk for health care firms. Our results are more robust for the systematic risk. For 3 industries, we discovered a significant positive impact of female appointments for 3 estimation windows out of 4. Thus, the presence of women on boards seems to be critical to reducing the systematic risk in industries historically considered as male such as information technologies and financial firms.

4. Conclusion

We supplement the existing literature on corporate governance by providing results on the link between gender board composition and firm risk-taking. More specifically, we studied the effect of the appointment of new directors (male and female) on a firm's risk level in light of three risk indicators (total risk, systematic risk and idiosyncratic risk). Thus, we compared the risk level before the new member's appointment to the risk level after the new member's appointment.

First, we considered the whole sample, that is to say the 100 firms included in the S&P100 index. The results indicated that there is no significant gender difference in the risk level before and after the appointment of a director whatever the considered type of risk and the length of the estimation window. Interestingly, we showed that no appointment (whatever the gender of the director) increased firm's systematic risk. Therefore, increases in firm's total risk after a director appointment is only due to the firm's increases in unsystematic risk. Nevertheless, these results could conceal some effects specific to some industries or to firm characteristics.

Therefore, we decided to conduct the same analysis by industry. Our main results can be summed up as follows. First, we noted that, industry-by-industry, the appointment of a female director more frequently has a positive impact on firm's risk than the appointment of a male director. Second, a director's appointment on the total risk differs according to the considered industry: female presence on boards could be particularly beneficial in industries such as consumer discretionary, consumer staples, energy and in health care, and male presence on boards such as information technologies and financial firms. Regarding the systematic risk, the impact of female appointments is particularly strong for financials, health care and firm in other industries, *i.e.* industries historically considered as male industries. We also note a gender effect on the unsystematic risk for firms in the health care industry.

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Table 2: Numbers of firms and numbers of appointments by industries

Industry	Nb. of firms	Women's appointment		Men's appointment	
		Number	%	Number	%
Consumer Discretionnary	11	23	17	112	83
Consumer Staples	15	41	20	169	80
Energy	10	15	12	106	88
Financials	14	17	12	123	88
Health Care	10	29	17	137	83
Industrials	13	31	15	181	85
Information Technology	14	41	23	135	77
Others	13	28	46	149	54

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Table 3: Results of proportion test for the 3 types of risks (whole sample)

	65 days			130 days			195 days			260 days		
	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b
Total Risk												
Male's prop.	54.59	23.83	20.14	38.49	31.92	28.24	32.55	33.99	32.10	25.72	38.13	34.98
Female's prop.	56.00	25.33	17.78	37.78	35.56	26.22	32.44	37.78	29.33	25.33	39.11	35.11
p-value	0.88	0.85	0.75	0.91	0.55	0.73	0.98	0.45	0.56	0.92	0.82	0.98
Systematic risk												
Male's prop.	84.80	13.58	0.00	81.56	16.82	0.00	79.32	19.06	0.00	75.72	22.66	0.00
Female's prop.	84.89	14.22	0.00	79.56	19.56	0.00	76.44	22.67	0.00	76.44	22.67	0.00
p-value	0.99	0.92	n.c	0.69	0.58	n.c	0.51	0.39	n.c	0.85	0.99	n.c
Unsystematic risk												
Male's prop.	52.79	24.73	20.86	36.42	31.29	30.67	38.13	29.50	30.76	35.88	30.85	31.65
Female's prop.	51.56	22.67	24.89	34.67	33.78	30.67	40.44	30.22	28.44	36.00	32.00	31.11
p-value	0.90	0.80	0.61	0.78	0.68	0.99	0.65	0.88	0.63	0.98	0.78	0.90

Notes: H_0, *the risk level is the same before and after the appointment*; H_1^a, *the risk level before the appointment is higher than the risk level after the appointment* and H_1^b, *the risk level before the appointment is lower than the risk level after the appointment*. *, ** and *** mean that the proportion test is statistically significant at the 1%, 5% and 10% level, respectively. n.c means that the test statistic is not computed because data are not available.

Table 4: Results of proportion test for the total risk by industry

	65 days			130 days			195 days			260 days		
	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b
Cons. Discretionary												
Male's prop.	58.93	24.11	13.39	43.75	29.46	24.11	29.46	37.04	31.11	26.79	41.07	29.46
Female's prop.	56.62	26.09	13.04	52.17	26.09	21.74	30.43	43.48	26.09	26.09	60.87	13.08
p-value	0.80	0.81	0.96	0.19	0.56	0.66	0.84	0.13	0.20	0.86	0.00*	0.00*
Cons. Staples												
Male's prop.	57.40	25.44	17.16	39.05	27.81	33.14	33.73	30.77	35.50	26.63	34.91	38.46
Female's prop.	60.98	19.51	19.51	31.71	36.59	31.71	29.27	41.46	29.27	21.95	36.59	41.46
p-value	0.70	0.46	0.75	0.23	0.14	0.81	0.36	0.03**	0.20	0.22	0.70	0.49
Energy												
Male's prop.	53.77	23.58	22.64	31.13	29.25	39.62	33.02	33.02	33.96	28.30	33.96	33.74
Female's prop.	66.67	13.33	20.00	33.33	40.00	26.67	26.67	40.00	33.33	33.33	33.33	33.33
p-value	0.16	0.16	0.74	0.64	0.02**	0.01**	0.18	0.16	0.90	0.22	0.88	0.30
Financials												
Male's prop.	59.35	17.89	20.33	39.84	28.46	29.27	31.71	39.02	26.83	21.14	44.72	33.33
Female's prop.	52.94	29.41	17.65	52.94	35.29	11.75	47.06	23.53	29.41	25.53	41.18	35.29
p-value	0.50	0.15	0.72	0.04**	0.25	0.00*	0.00*	0.00*	0.58	0.52	0.43	0.64

Notes: H_0, *the risk level is the same before and after the appointment*; H_1^a, *the risk level before the appointment is higher than the risk level after the appointment* and H_1^b, *the risk level before the appointment is lower than the risk level after the appointment*. *, ** and *** mean that the proportion test is statistically significant at the 1%, 5% and 10% level, respectively. n.c means that the test statistic is not computed because data are not available.

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Table 5: Results of proportion test for the total risk by industry (continued))

	65 days			130 days			195 days			260 days		
	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b
Health Care												
Male's prop.	44.53	29.93	24.09	38.69	29.20	30.66	33.58	33.58	31.39	24.09	38.69	35.77
Female's prop.	55.17	31.03	13.79	34.48	44.83	20.69	34.48	31.03	34.48	17.24	41.38	41.38
p-value	0.26	0.90	0.16	0.50	0.01**	0.08***	0.85	0.60	0.53	0.06***	0.54	0.20
Industrials												
Male's prop.	59.61	23.20	18.78	40.33	30.39	28.18	37.02	31.49	30.39	28.18	35.36	35.36
Female's prop.	58.06	16.13	22.58	32.26	32.26	32.26	25.81	32.26	38.71	25.81	35.48	35.48
p-value	0.90	0.35	0.62	0.19	0.75	0.49	0.02**	0.87	0.09***	0.55	0.98	0.98
Information technologies												
Male's prop.	54.07	22.96	20.74	30.37	42.22	25.19	28.15	43.70	25.93	21.48	43.70	32.59
Female's prop.	48.78	29.27	21.95	36.59	39.02	24.39	29.27	41.46	29.27	29.27	31.71	39.02
p-value	0.58	0.45	0.88	0.31	0.61	0.87	0.81	0.66	0.47	0.04**	0.01**	0.13
Others												
Male's prop.	53.02	20.13	25.50	37.58	29.53	31.54	33.56	25.50	39.60	30.20	33.56	34.90
Female's prop.	60.71	25.00	14.29	32.14	39.29	28.57	50.00	39.29	10.71	32.14	35.71	32.14
p-value	0.41	0.54	0.14	0.38	0.11	0.62	0.00*	0.00*	0.00*	0.64	0.61	0.51

Notes: H_0, *the risk level is the same before and after the appointment*; H_1^a, *the risk level before the appointment is higher than the risk level after the appointment* and H_1^b, *the risk level before the appointment is lower than the risk level after the appointment*. *, ** and *** mean that the proportion test is statistically significant at the 1%, 5% and 10% level, respectively. n.c means that the test statistic is not computed because data are not available.

Table 6: Results of proportion test for the systematic risk by industry

	65 days			130 days			195 days			260 days		
	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b
Cons. Discretionary												
Male's prop.	84.82	11.61	0.00	79.46	16.96	0.00	76.79	19.64	0.00	71.43	25.00	0.00
Female's prop.	78.26	17.83	0.00	86.96	8.70	0.00	73.91	21.74	0.00	73.91	21.74	0.00
p-value	0.37	0.39	n.c	0.12	0.05***	n.c	0.52	0.62	n.c	0.53	0.39	n.c
Cons. Staples												
Male's prop.	85.71	14.29	0.00	84.52	15.48	0.00	80.95	19.05	0.00	76.19	23.81	0.00
Female's prop.	97.56	2.44	0.00	87.80	12.20	0.00	85.37	14.63	0.00	87.80	12.20	0.00
p-value	0.02**	0.03**	n.c	0.46	0.46	n.c	0.26	0.27	n.c	0.00*	0.00*	n.c
Energy												
Male's prop.	82.08	17.92	0.00	87.74	12.26	0.00	87.74	12.26	0.00	82.08	17.92	0.00
Female's prop.	93.33	6.67	0.00	93.33	6.67	0.00	80.00	20.00	0.00	80.00	20.00	0.00
p-value	0.07	0.08	n.c	0.14	0.13	n.c	0.04**	0.04**	n.c	0.55	0.55	n.c
Financials												
Male's prop.	86.18	10.57	0.00	74.80	21.95	0.00	74.80	21.95	0.00	73.98	22.76	0.00
Female's prop.	70.59	29.41	0.00	70.59	29.41	0.00	64.71	35.29	0.00	58.82	41.18	0.00
p-value	0.04**	0.01**	n.c	0.46	0.18	n.c	0.03**	0.00*	n.c	0.00*	0.00*	n.c

Notes: H_0, *the risk level is the same before and after the appointment*; H_1^a, *the risk level before the appointment is higher than the risk level after the appointment* and H_1^b, *the risk level before the appointment is lower than the risk level after the appointment*. *, ** and *** mean that the proportion test is statistically significant at the 1%, 5% and 10% level, respectively. n.c means that the test statistic is not computed because data are not available.

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Table 7: Results of proportion test for the systematic risk by industry (continued))

	65 days			130 days			195 days			260 days		
	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b
Health Care												
Male's prop.	88.86	11.68	0.00	78.10	20.44	0.00	72.99	25.55	0.00	69.34	29.20	0.00
Female's prop.	86.21	13.79	0.00	75.86	24.14	0.00	79.31	20.69	0.00	79.31	20.69	0.00
p-value	0.92	0.74	n.c	0.68	0.49	n.c	0.15	0.27	n.c	0.01**	0.03**	n.c
Industrials												
Male's prop.	83.98	14.92	0.00	83.43	15.47	0.00	80.66	18.23	0.00	77.35	21.55	0.00
Female's prop.	83.87	12.90	0.00	83.87	12.90	0.00	77.42	19.35	0.00	87.10	9.68	0.00
p-value	0.99	0.76	n.c	0.93	0.57	n.c	0.44	0.78	n.c	0.00*	0.00*	n.c
Information technologies												
Male's prop.	84.44	13.33	0.00	87.41	10.37	0.00	82.96	14.81	0.00	81.48	16.30	0.00
Female's prop.	78.05	21.95	0.00	75.61	24.39	0.00	78.05	21.95	0.00	68.29	31.71	0.00
p-value	0.39	0.23	n.c	0.02**	0.00*	n.c	0.23	0.08***	n.c	0.00*	0.00*	n.c
Others												
Male's prop.	84.56	14.09	0.00	77.18	21.48	0.00	78.52	20.13	0.00	74.50	24.16	0.00
Female's prop.	85.71	14.29	0.00	64.29	35.71	0.00	64.29	35.71	0.00	67.86	32.14	0.00
p-value	0.87	0.98	n.c	0.03**	0.01*	n.c	0.00*	0.00*	n.c	0.10	0.05***	n.c

Notes: H_0, *the risk level is the same before and after the appointment*; H_1^a, *the risk level before the appointment is higher than the risk level after the appointment* and H_1^b, *the risk level before the appointment is lower than the risk level after the appointment*. *, ** and *** mean that the proportion test is statistically significant at the 1%, 5% and 10% level, respectively. n.c means that the test statistic is not computed because data are not available.

Table 8: Results of proportion test for the unsystematic risk by industry

	65 days			130 days			195 days			260 days		
	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b
Cons. Discretionary												
Male's prop.	58.04	24.11	14.29	41.07	31.25	24.11	38.39	28.57	29.46	33.93	30.36	32.14
Female's prop.	52.17	21.74	21.74	43.48	30.43	21.74	47.83	30.43	17.39	39.13	30.43	26.09
p-value	0.54	0.77	0.31	0.71	0.89	0.66	0.07^{***}	0.69	0.01^{**}	0.23	0.98	0.14
Cons. Staples												
Male's prop.	56.55	22.02	21.43	39.88	33.33	26.75	42.26	29.17	28.57	41.07	29.17	29.76
Female's prop.	51.22	19.51	29.27	34.15	34.15	31.71	39.02	31.1	29.27	31.71	26.83	41.46
p-value	0.57	0.75	0.34	0.36	0.89	0.40	0.53	0.60	0.88	0.03^{**}	0.56	0.01^{**}
Energy												
Male's prop.	53.77	27.36	18.87	34.91	31.13	33.96	35.85	30.19	33.96	36.79	29.25	33.96
Female's prop.	66.67	20.00	13.33	46.67	33.33	20.00	53.33	40.00	6.67	53.33	33.33	13.33
p-value	0.16	0.36	0.43	0.06^{***}	0.72	0.01^{**}	0.00^{*}	0.05^{***}	0.00^{*}	0.00^{*}	0.32	0.00^{*}
Financials												
Male's prop.	47.97	27.64	21.14	26.83	34.96	34.15	33.33	35.77	27.64	26.83	36.59	33.33
Female's prop.	47.05	23.53	29.41	23.53	47.06	29.41	47.06	29.41	23.53	29.41	35.29	35.29
p-value	0.92	0.62	0.32	0.55	0.05^{***}	0.43	0.01^{**}	0.19	0.36	0.52	0.76	0.64

Notes: H_0, *the risk level is the same before and after the appointment*; H_1^a, *the risk level before the appointment is higher than the risk level after the appointment* and H_1^b, *the risk level before the appointment is lower than the risk level after the appointment*. *, ** and *** mean that the proportion test is statistically significant at the 1%, 5% and 10% level, respectively. n.c means that the test statistic is not computed because data are not available.

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Table 9: Results of proportion test for the unsystematic risk by industry (continued))

	65 days			130 days			195 days			260 days		
	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b	H_0	H_1^a	H_1^b
Health Care												
Male's prop.	45.26	27.74	25.55	33.58	30.66	34.31	34.31	27.74	36.50	32.12	29.93	36.50
Female's prop.	62.07	27.59	10.34	37.93	44.83	17.24	41.38	37.93	20.69	24.14	55.17	20.69
p-value	0.07***	0.99	0.03**	0.48	0.02**	0.00*	0.16	0.04**	0.00*	0.05***	0.00*	0.00*
Industrials												
Male's prop.	59.12	22.65	17.13	37.57	32.04	29.28	41.44	30.39	27.07	36.46	32.04	30.39
Female's prop.	51.61	19.35	25.81	19.35	38.71	38.71	19.35	38.71	38.71	32.26	29.03	35.48
p-value	0.43	0.67	0.26	0.00*	0.28	0.12	0.00*	0.09***	0.02**	0.32	0.46	0.22
Information technologies												
Male's prop.	51.11	23.70	22.96	31.11	31.85	34.81	34.07	30.37	33.33	37.04	31.85	28.89
Female's prop.	41.46	21.95	36.59	26.83	34.15	39.02	39.02	26.83	34.15	43.90	31.71	24.39
p-value	0.31	0.83	0.11	0.46	0.71	0.50	0.32	0.45	0.87	0.12	0.97	0.25
Others												
Male's prop.	48.99	24.83	24.83	37.58	26.17	34.90	42.28	24.48	31.54	40.27	28.19	30.20
Female's prop.	50.00	28.57	21.43	32.29	21.43	39.29	50.00	10.71	39.29	39.29	17.86	42.86
p-value	0.92	0.66	0.67	0.79	0.39	0.48	0.14	0.00*	0.12	0.82	0.01**	0.00*

Notes: H_0, *the risk level is the same before and after the appointment*; H_1^a, *the risk level before the appointment is higher than the risk level after the appointment* and H_1^b, *the risk level before the appointment is lower than the risk level after the appointment*. *, ** and *** mean that the proportion test is statistically significant at the 1%, 5% and 10% level, respectively. n.c means that the test statistic is not computed because data are not available.