Strengthening Corporate Governance and Expectations for Female Directors

By

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Introduction

In this study, based on the enhancement of corporate governance (hereafter referred to as CG) that stemmed from the Enron scandal in the 2000s, we clarify the recent trend of appointing female executives, a topic that has been actively discussed in our country. It can be said that in almost all cases of accounting irregularities like the Enron scandal, a decline in corporate value is recognized. The empirical research results on preventing accounting irregularities that followed have also almost entirely pointed out the strengthening of CG. Along with this discussion, recently in our country, there has been a growing interest in the appointment of female executives. By appointing women to external director roles, which have been slowly introduced in our country, there is an opportunity to increase both the number and ratio of external directors and the number and ratio of female executives. Business leaders might believe that this approach is effective in creating a corporate image that considers Environmental, Social, and Governance (ESG) factors as part of efforts to achieve Sustainable Development Goals (SDGs) for investors.

While the appointment of female executives has progressed in the West, it has lagged behind in our country. As a result, when analyzing the current state of such appointments, we often learn from overseas research examples. There are studies focusing on how the composition of the board of directors and the presence or absence of an audit committee are related to accounting irregularities. There are also studies examining the relationship between the board's composition and corporate performance. In this research, we have learned from these prior studies and clarified the impact of the proportion of female executives in our country on corporate performance.

In this paper, we examine some of the issues left unresolved in Sakurada [2021], which we consider as a prior study. In Sakurada [2021], the main data period was set from October of 2017 to September of 2018, analyzing all listed companies during this period to verify, using

OLS, whether the ratio of female executives affects corporate performance. As a result, while there was no evidence that an increase in the ratio of female executives improved ROA, investors reacted favorably to the increase in this ratio, concluding that an increase in the ratio of female executives improved Tobin's Q. However, this analysis collectively analyzed companies listed on four markets: Tokyo Stock Exchange (TSE) First Section, TSE Second Section, TSE Mothers, and JASDAQ. Considering the differences in the difficulty and necessity of acquiring female directors by market and the historical background of the establishment of these four markets, we felt the need to re-examine Sakurada [2021]'s comprehensive analysis in detail.

From the above problem awareness, when we tried to improve and verify Sakurada [2021]'s analysis, the results from the four markets showed intriguing differences. It became clear that companies on the TSE Second Section achieved a higher Tobin's Q with a lower ratio of female executives compared to companies on the TSE First Section. While we focused on both ROA and Q as measures of corporate performance, it was clear that the ratio of female executives affected Q but did not affect ROA, thus supporting the findings of Sakurada [2021].

The following will 1. Mention the background of the research, 2. Review previous studies, and then 3. Present the analysis results. For the conclusion, the remaining issues of this study will be indicated.

1. Research Background

In the United States, in October 2001, the Enron accounting scandal occurred, and the following year, a similar scandal emerged with WorldCom. In Japan, in 2002, Kanebo engaged in financial manipulation to disguise a massive debt as profits, leading to a scandal and the company's delisting from the stock market. The same year in the U.S., the Sarbanes-Oxley Act of 2002 was established. The origin of our current corporate governance (CG) research traces back to the Enron scandal and the SOX law. However, in the U.S., attention was already being paid to corporate governance as a means to deter unethical and inhumane corporate behaviors in the 1960s, including efforts to prevent corporate scandals like financial statement fraud. Subsequently, from the 1980s to the 90s, corporate acquisitions progressed, and institutional investors gained more influence [1], while both Japan and Europe saw numerous scandals. Hirata [2007, pp.7] points to economic maturation and stagnation as factors behind these

incidents.

In the UK, since the publication of the Cadbury Report in 1992, the disclosure of information related to the performance of CG has been mandated as a listing rule on the London Stock Exchange. In Germany, CG reforms based on joint decision-making involving employees, management representatives, and trade union representatives have progressed[2]. In Japan, the Japan Business Federation (abbreviated as "Keidanren") has been calling for the mandatory introduction of outside directors and strengthening the independence of external officers. In 2015, the CG Code was established, institutionalizing the appointment of independent outside directors for listed companies[3].

Regarding the definition of fraudulent accounting, according to the Japanese Institute of Certified Public Accountants[4], it is defined as the act of altering financial statements or diverting assets for personal use. CG is defined as a system for companies to make transparent, fair, and quick and decisive decisions, considering the positions of shareholders, customers, employees, and the local community[5]. Furthermore, Keidanren defines CG as a mechanism for corporate management that comprehensively views the prevention of corporate misconduct and the improvement of competitiveness and profitability, aiming for the long-term increase of corporate value.

In view of the above, this paper will address the following question: While CG has been strengthened to prevent accounting fraud, has it met the expectations of investors? To verify this, we will clarify whether the financial structure, such as the shareholding ratio of managers, foreigners, and institutional investors, compensation systems such as stock options (abbreviated as "SO"), company size, and debt ratio, affects Tobin's Q.

In addition, in Japan, there is a growing focus on the appointment of female directors as one of the measures to strengthen CG. This study aims to clarify whether companies that employ them actually affect corporate performance. However, it is not considered that corporate performance will monotonously increase indefinitely as the ratio of female directors increases; there is thought to be a limit. In other words, if companies believe it's sufficient to impress investors with ESG initiatives and receive favorable evaluations by having a certain number of female directors, their number or ratio would peak at a certain level. To clarify the impact of CG factors, including the ratio of female directors, on corporate performance, the next section will provide an overview of prior research relevant to this study.

2. Literature Review

2.1 Regarding Accounting Fraud and Board Composition

Beaseley [1996, p.43] examined the possibility of fraudulent accounting between 1980 and 1991 in the U.S. using data from 75 listed companies that committed accounting fraud and 75 that did not. Through logistic regression analysis, the results revealed a statistically significant trend: as the proportion of external directors in the board of directors increased, the occurrence of fraudulent accounting decreased. However, the study also found that the existence or non-existence of an audit committee did not significantly affect the likelihood of accounting fraud.

Previous studies, as mentioned, indicated that the number of external directors affects the occurrence of fraudulent accounting. However, according to Masuda [2015, pp.24,32-33], the proportion of external directors does not influence the incidence of fraudulent accounting[6]. This research looked at 69 companies from 2006 to 2014 that were recommended for penalties based on "false disclosures." By matching firms on four criteria (industry, stock exchange, business size, period), the study examined whether factors like the number of directors, the proportion of external directors on the board or audit committee, and the presence of financial expert external directors affected the occurrence of accounting fraud. Interestingly, while one might think firms that introduced stock options (SO) would be more likely to engage in accounting fraud to increase compensation, the findings suggested the opposite. Companies that did not introduce SOs showed a greater tendency for fraudulent accounting (Masuda [2015, pp.29]).

2.2 Accounting Fraud and Audit Committees

Huang and Thiruvadi [2010, pp.71,76-80] examined the relationship between the number of audit committee meetings, the number of committee members, the number of financial experts, and the occurrence of accounting fraud. Using the S&P SmallCap600, they finalized a sample of 218 companies for the fiscal years of 2002 to 2003, connecting data related to the audit committees collected from the SEC database. The analysis revealed that:1) The number of audit committee meetings had no significant relationship with preventing fraudulent accounting.2) The number of audit committee members did not greatly influence fraud prevention.3) Financial experts had a significant impact on fraud prevention.4) Audit

committees with at least one female director functioned differently from those comprised solely of men.5) Clients of the Big 4 accounting firms were more likely to have more financial experts than clients outside of the Big 4s. From these analytical results, it can be said that they support the SEC's argument that financial expertise in audit committees is crucial for effective corporate governance (CG) and financial reporting.

2.3. Board Composition and Corporate Performance

In September 2015, the SDGs (Sustainable Development Goals) were adopted at the UN summit. Concerning gender equality, as of December 2020, Japan's ranking in the Gender Gap Index (GGI) released by the World Economic Forum was 121st out of 153 countries, highlighting its lag in gender equality. In response, the Financial Services Agency and the TSE, in the revised Corporate Governance Guidelines (CG Code) of June 21, 2021, encouraged the proactive appointment of female executives. Keidanren (Japan Business Federation) has set a goal of having 30% female executives by 2030. There are numerous studies indicating that gender equality in corporate management, beyond just addressing disparities, brings about beneficial effects in terms of corporate governance.

In a study by Adams and Ferreira [2009, pp.293-307], which examined the hypothesis that gender diversity in boards affects CG, they extracted data from 1,939 companies listed on the S&P 500, S&P MidCaps, and S&P SmallCap between 1996 and 2003. The analysis revealed that companies might be influenced by corporate characteristics when appointing female directors. Controlling for various factors like endogeneity, they pointed out a significant negative relationship between gender diversity and corporate performance. Huang and Thiruvadi [2010, pp.79] also highlighted similar points as the above-mentioned study by Adams and Ferreira [2009]. They noted that audit committees with female auditors have statistically significantly more meetings than all-male committees, suggesting that committees with female auditors are more diligent.

Newkura and Seko [2017, pp.1,9,17-19], using data from TSE -listed companies from 2011 to 2014, analyzed the impact of an increase in the proportion of female executives on performance. They acknowledged that companies with female executives might inherently have environments conducive to such appointments. Still, even with fixed-effects models, they found that an increase in the proportion of female executives has a positive effect on

performance.

3. Current Status of Female Executive Appointments

3.1 Significance of the Analytical Model and Data

Labor economists and econometricians have been fixated on clarifying the relationship between the profitability metric ROA (Return on Assets) and the proportion of female executives in a company. However, from the standpoint of this paper, which is rooted in accounting research, we also simultaneously consider investors' expectations regarding the proportion of female executives. This means that while labor economists have been keenly focused on whether or not women's active participation actually generates profit, leading them to use ROA as a dependent variable in their analytical models, investors might anticipate that women's contributions increase the future value of a company. Particularly for investors, female executives might be more noticeable than female employees or female managers.

In this manner, it's not just about the contribution of the proportion of female executives to ROA, but also its significance in relation to Tobin's Q. Specifically, both Sigel and Kodama (2011) and Yamamoto (2014) have found and argued, based on their analytical results, for the contribution of women to corporate profits. While the former focuses on the exploitation of female labor, the latter emphasizes the improvement in productivity by women, both from a labor economics perspective. In contrast, when Tobin's Q is used as the dependent variable, it allows for a discussion distinct from the viewpoints of these representative labor economists.

Therefore, if a positive relationship is recognized between Tobin's Q and the proportion of female executives, it would be appropriate to interpret this as favorable evaluation and expectation by investors. This favorable response from investors implies not only their strong focus on returns, but with the recent addition of the perspective of ESG (Environmental, Social, and Governance) investment, investors are also demanding CSR (Corporate Social Responsibility). Given this premise, they might expect that an increase in the proportion of female executives leads to future profit gains and show a positive evaluation in relation to Q.

Additionally, as a prior study attempting to verify the impact of the proportion of female executives on corporate performance, there exists research by Arakura and Seko (2017). Their study is based on data from 2011 to 2014. As a result, they found that "in companies where female executives exist, the higher the proportion of female executives, the better the

performance when viewed by Tobin's Q" (Arakura & Seko, 2017, pp.14-15). Thus, the implications derived when setting Tobin's Q as the dependent variable alongside ROA concerning the effect of the proportion of female executives on corporate performance are abundant. In the following sections of this paper, we will clarify the effect of the proportion of female executives on corporate performance using the next analytical model. The most distinctive feature of this study is that we introduce the squared term of the proportion of female executives and attempt to verify the hypothesis that there's a peak in the relationship between the proportion of female executives and corporate performance.

$$ROA_i \text{ or } Tobin'sQ_i = \alpha + \beta_1 DIR_i + \beta_2 SO_i + \beta_3 BRDAGEAV_i + \beta_{4.1} \boldsymbol{IDW\_RTO_i}$$
$$+ \beta_{4.2} \boldsymbol{IDW\_RTO^2_i} + \beta_5 LnAss_i + \beta_6 EBITDA\ margin\ ratio_i + \beta_7 BTD3_i$$
$$+ \beta_8 SA\ Ratio_i + \beta_9 DASS_i + \beta_{10} FRGN_i + \beta_{11} INST_i + \beta_{12} Accounting\ standerd\ dummy_i$$
$$+ \beta_{13} Consoridated\ dummy_i + \sum_{k=1\sim32} \beta_{14k}\ Industry\ dummy_{ik} + u_i$$

Figure1: Definition and Basic Statistics of the Analyzed Data for the 33 Listed Industries

Variable classification/abbreviation name		Variable definition	frequency	Average	standard deviation	minimum	quartile			Maximum
							1st	2nd	3rd	
Dependent variable	ROA	Ordinary Income/Total Assets/Prior Term*100: Priority given to consolidation	2,862	6.6398	5.8723	-24.09	3.1585	5.8697	9.2761	33.97
	Q	(Market capitalization + Total liabilities)/Total assets	2,862	1.4624	1.0904	0.57	0.9118	1.0955	1.5301	9.64
Executive compensation	DIR	Officer shareholding ratio	2,862	7.2172	11.8959	0	0.2740	1.6882	8.3546	67.41
	SO	1 for company with a stock option system	2,859	0.2872	0.4525	0	0	0	1	1
Board of directors	BRDAGEAV	Average age of directors	2,862	60.0835	4.8719	42	58	61	63	69
	IDW_RTO	Ratio of female executives	2,862	3.7696	5.8005	0	0	0	7.70	27.30
Financial information	LnAss	Natural log transformed value of total assets	2,862	10.6719	1.7421	6.65	9.4569	10.4961	11.6894	16.13
	EBITDA margin ratio	(EBITDA/Sales, etc.)*100	2,862	0.1033	0.0806	-0.29	0.0552	0.0896	0.1408	0.48
	BTD3	(Profit before income taxes and minority interests - corporate tax, inhabitant tax and enterprise tax/statutory tax rate)/total assets at the beginning of the period	2,737	0.0016	0.0377	-0.29	-0.0062	0.0037	0.0139	0.39
External discipline	SA Ratio	Sales/total assets	2,862	1.0786	0.5629	0.02	0.7074	0.9610	1.3492	3.26
	DASS	Total Liabilities/Total Assets*100	2,862	47.2517	19.5327	8.00	31.90	46.70	61.60	95.40
	FRGN	Foreign (individual) shareholding ratio	2,862	0.0428	0.1636	0	0	0	0	2.40
	INST	Shareholding ratio of domestic institutional investors	2,862	7.8148	6.9016	0.00	1.60	6.55	12.17	29.80
Others	Accounting standards dummy	1 for application of SEC/IFRS standards	2,762	0.0377	0.1904	0	0	0	0	1
	Consolidated dummy	1 for consolidated companies	2,762	0.8769	0.3286	0	1	1	1	1
Market dummy	1st dummy	1 for Listed commpany on the First Section of the Tokyo Stock Exchange	2,862	0.6209	0.4852	0	0	1	1	1
	2nd dummy	1 for Listed commpany on the Second Section of the Tokyo Stock Exchange	2,862	0.1440	0.3511	0	0	0	0	1
	Mothers dummy	1 for Listed commpany on the Mothers Section of the Tokyo Stock Exchange	2,862	0.0409	0.1980	0	0	0	0	1
	JQ dummy	1 for Listed commpany on the JQ Section of the Tokyo Stock Exchange	2,862	0.1943	0.3957	0	0	0	0	1

In reality, the factors that affect corporate performance are not solely the proportion of female

executives, but many other variables are also taken into account. The definition of the dependent variable and control variables is as shown in "Figure 1". Among the analysis target data, ROA, Q, DIR, SO, BRDAGEAV, IDW_RTO, DASS, FRGN, INST, accounting standard dummy, and consolidated dummy are derived from Cges data, and the target fiscal year was set from October 2017 to September 2018. Additionally, the EBITDA margin ratio is based on eol data and uses data from companies that settled in 2018, with LnAss, BTD3, and the SA Ratio being calculated from eol. Across all variables, an initial sample of up to 3,645 company data was targeted, but values below the 1st percentile and above the 99th percentile were treated as outliers and removed.

Among the above variables, further explanation might be needed for BTD3 and the SA Ratio (Sales to Assets Ratio). The former is one of the tax burden rates, and according to Cappellesso and Rodrigues [2019], they analyzed 14,386 companies from G20 countries from 2006 to 2016 and claimed tax evasion was discovered using BTD. Tax evasion activities by companies are observed by looking at Discretional Accruals (DACC), and as indicated in this paper, it is mainstream in empirical research in the field of tax accounting to think that managers intend to evade taxes when BTD is high.

Figure 2: Correlation Coefficient Table between Variables

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
① DIR	1												
	2,862												
② SO	0.228	1											
	0.000												
	2,859	2,859											
③ BRDAGEAV	-0.393	-0.288	1										
	0.000	0.000											
	2,862	2,859	2,862										
④ IDW_RTO	0.095	0.103	-0.144	1									
	0.000	0.000	0.000										
	2,862	2,859	2,862	2,862									
⑤ LNASS	-0.400	-0.099	0.431	0.065	1								
	0.000	0.000	0.000	0.001									
	2,862	2,859	2,862	2,862	2,862								
⑥ EBITDA margin ratio	-0.010	0.043	0.040	0.024	0.214	1							
	0.580	0.021	0.034	0.205	0.000								
	2,862	2,859	2,862	2,862	2,862	2,862							
⑦ BTD3	-0.077	-0.048	0.104	-0.011	0.119	0.252	1						
	0.000	0.012	0.000	0.553	0.000	0.000							
	2,737	2,736	2,737	2,737	2,737	2,737	2,737						
⑧ SA Ratio	0.163	0.072	-0.170	0.054	-0.229	-0.512	-0.132	1					
	0.000	0.000	0.000	0.004	0.000	0.000	0.000						
	2,862	2,859	2,862	2,862	2,862	2,862	2,737	2,862					
⑨ DASS	-0.005	0.033	0.029	0.021	0.216	-0.240	-0.133	0.133	1				
	0.772	0.075	0.122	0.267	0.000	0.000	0.000	0.000					
	2,862	2,859	2,862	2,862	2,862	2,862	2,737	2,862	2,862				
⑩ FRGN	0.122	0.079	-0.108	0.008	-0.168	-0.066	-0.069	0.005	0.017	1			
	0.000	0.000	0.000	0.659	0.000	0.000	0.000	0.780	0.362				
	2,862	2,859	2,862	2,862	2,862	2,862	2,737	2,862	2,862	2,862			
⑪ INST	-0.199	0.042	0.183	0.106	0.536	0.225	0.112	-0.131	0.001	-0.099	1		
	0.000	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.965	0.000			
	2,862	2,859	2,862	2,862	2,862	2,862	2,737	2,862	2,862	2,862	2,862		
⑫ Accounting standards dummy	-0.057	0.036	0.042	0.088	0.283	0.087	0.075	-0.070	0.019	-0.012	0.166	1	
	0.003	0.057	0.026	0.000	0.000	0.000	0.000	0.000	0.309	0.516	0.000		
	2,762	2,761	2,762	2,762	2,762	2,762	2,737	2,762	2,762	2,762	2,762	2,762	
⑬ Consolidated dummy	-0.148	-0.032	0.142	0.026	0.323	0.036	0.047	-0.054	0.098	-0.006	0.202	0.074	1
	0.000	0.097	0.000	0.174	0.000	0.058	0.013	0.004	0.000	0.760	0.000	0.000	
	2,762	2,761	2,762	2,762	2,762	2,762	2,737	2,762	2,762	2,762	2,762	2,762	2,762

As for the SA ratio, following Ang et al [2000, pp.93-95], it's a ratio of sales to total assets, and it is said that agency costs can be measured using this indicator. According to Ang et al

[2000], if sales are high compared to a certain amount of total assets, agency costs decrease. When agency costs are low, a positive relationship between the SA Ratio and ROA is expected.

"Figure 2" is a correlation coefficient table between variables. A correlation exceeding 0.5 is observed between the EBITDA margin ratio and the SA Ratio and between LnAss and INST, but as they are not extremely strong correlations, they are acceptable. However, the negative correlation observed between the EBITDA margin ratio and SA Ratio suggests that when the SA Ratio rises, that is, in a state where agency costs decrease, the EBITDA margin ratio decreases. Typically, an increase in profit is expected in a situation where agency costs are low, but considering the composition of both ratios, with the denominator being sales for the EBITDA margin ratio and the numerator being sales for the SA Ratio, if EBITDA or total assets are constant, both ratios would have an inverse correlation. Therefore, the observed negative relationship between the EBITDA margin ratio and SA Ratio is logical.

As for the relationship between LnAss and INST, it indicates that institutional investors increase their investment ratios in larger companies. This situation aligns with the findings of Guercio [1996, p.52].

3.2 Maximizing Corporate Performance and the Ratio of Female Directors

From the analysis results shown in Figure 3, it became clear that the ratio of female executives affects Q only when analyzing companies listed in the first and second sections of the TSE, and it was also evident that this influence is significant when estimated as a curve. In other markets, the influence of the female executive ratio on corporate performance is not significant. We attempted to analyze using the previously indicated model for data from the four markets. Among them, for companies listed on the TSE Mothers, the sample size is smaller compared to the other three markets. Therefore, we avoided incorporating the tax burden ratio (BTD3), accounting standard dummy, consolidated dummy, and industry dummy. Additionally, in the same table, the number on the left side of each cell for the variables represents the coefficient of the explanatory variable. The asterisks on the right side indicate significance levels: *** indicates a 1% significance level, ** indicates a 5% significance level, and * indicates a 10% significance level.

From the results in Figure 3, it became clear from Figure 4 that the relationship between the ratio of female executives and Q is depicted as a convex parabola with an extremum in the first

quadrant. In this chart, the horizontal axis represents the ratio of female executives, measured in percentages, while the vertical axis represents Q. The solid line shows the relationship between the ratio of female executives and Q for the first section of the TSE, and the dotted line represents the relationship for the second section. Their intersection occurs when the ratio of female executives is 20.46%, at which point Q is 3.23. From the two curves, the extremum for the first section-listed companies is at a female executive ratio of 15.0%, where Q is at its maximum of 3.26. Similarly, for the second section, the maximum Q value of 3.69 is reached at a 5.25% female executive ratio. In Figure 4, the relationship between the two variables for the first section companies forms a gently upward sloping parabola for most of the first quadrant, while for the second section companies, it forms a downward sloping parabola for most of the first quadrant.

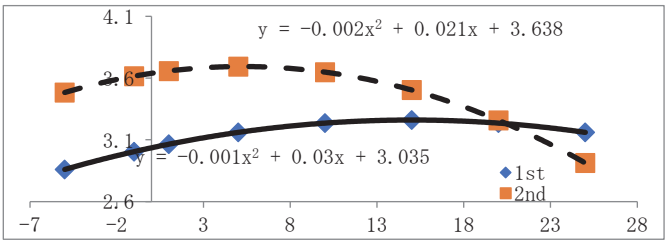
Figure 3: Analysis Results

	Dependent variable : ROA				Dependent variable : Q			
Market	1st	2nd	Mothers	JQ	1st	2nd	Mothers	JQ
Cons	6.783 ***	-1.817	4.534	0.325	3.035 ***	3.638 ***	10.707 ***	3.924 ***
DIR	0.072 ***	0.034 *	0.225 ***	0.026 *	0.012 ***	0.002	0.039 ***	-0.003
SO	0.310	0.014	-3.287	-0.258	0.180 ***	0.015	0.319	0.184 **
BRDAGEAV	-0.077 ***	-0.072	-0.481 **	-0.016	-0.025 ***	-0.018 ***	-0.042	-0.012 *
IDW_RTO	0.045	0.092	-0.505	0.047	**0.030 *** **	**0.021 * **	-0.104	-0.010
IDW_RTO^2	-0.003	-0.007	0.026	-0.003	**-0.001 ** **	**-0.002 ** **	0.004	0.000
LnAss	-0.331 ***	0.464 **	3.525 ***	0.044	-0.119 ***	-0.166 ***	-0.495 *	-0.224 ***
EBITDA margin ratio	41.958 ***	32.352 ***	4.076 ***	44.559 ***	6.253 ***	-0.253	0.048	0.642
BTD3	18.998 ***	19.185 ***	投入せず	4.934	-0.004	-1.538 ***	投入せず	-1.130 *
SA Ratio	5.252 ***	2.624 ***	0.047	3.868 ***	0.592 ***	0.010	-0.965 **	0.162 ***
DASS	-0.063 ***	-0.026 ***	-0.151 ***	-0.059 ***	-0.002	0.002 **	-0.024 **	0.000
FRGN	-1.406	-0.621	-1.061	-0.587	-0.112	0.374 **	0.233	-0.046
INST	0.088 ***	0.216 ***	0.261	0.121 **	0.023 ***	0.027 ***	0.070	0.037 ***
Accounting standards dummy	1.057 ***	3.147	No	-0.119	0.269 ***	0.391	No	0.344
Consolidated dummy	1.383 ***	-0.021		0.190	-0.056	-0.057		-0.081
Industry dummy	Yes	Yes	No	Yes	Yes	Yes	No	Yes
adjR2	0.431	0.487	0.467	0.535	0.579	0.374	0.136	0.257
f (significance probability)	29.332 (0.000)	10.216 (0.000)	12.712 (0.000)	17.000 (0.000)	52.459 (0.000)	6.797 (0.000)	3.111 (0.001)	5.805 (0.000)
N	1,723	399	148	558	1,723	399	148	558

Thus, the effect of the female executive ratio on Q does not simply increase or decrease monotonically between the two variables. A more complex relationship is observed. Similar findings can be found in Short and Keasey [1999]. According to them, the influence of the executive shareholding ratio on corporate performance indicators traces a cubic curve. Though the findings of Short and Keasey [1999] go back about 10 years, Morck et al [1988] also derived similar analytical results. They analyzed the effect of the executive shareholding ratio on Q using 371 companies from the Fortune 500 in December 1980. As a result, they divided the ratio into 0%-5%, 5%-25%, and over 25%, clarifying its relationship with Q. Both internal

and external directors increase Q up to a 5% shareholding, but from 5% to 25%, Q declines, and after 25%, Q increases again[7]. Accordingly, in this section, a non-monotonic relationship between Q and the female executive ratio was discovered from the OLS model, specifically a convex quadratic curve.

Figure 4: Ratio of Female Executives that Maximizes Tobin's Q



3.3 Discussion of Analysis Results

The primary objective of this research is to clarify the impact of the proportion of female executives on corporate performance. The results are as mentioned in the previous section, but this section attempts to provide some commentary on the influence of other variables. It became clear that an increase in the executive shareholding ratio (DIR) increases ROA in four markets. Moreover, a positive relationship was observed between the increase in Q and the first section of the TSE and its Mothers. This indicates that when the executive shareholding ratio increases, not only does profitability increase, but investors' expectations also rise, supporting the findings of Morck et al [1988] and Short and Keasey [1999]. Although it was hypothesized that an increase in the ratio of female executives would have a similar effect on corporate performance as the effect of the executive shareholding ratio, it turned out that while there was no impact on profit figures, investors' expectations were recognized.

Regarding the impact of the average age of executives (BRDAGEAV) on corporate performance, there are variations across markets, but both ROA and Q have a negative relationship. This suggests that younger executives lead to higher corporate profits, and investors have higher expectations. Shimizu [2007, p.42] mentioned that "The age of the manager can be considered a proxy for accumulated experience, which may positively affect corporate value." However, considering that "due to rapid technological progress and the

globalization of the economy, past experiences and knowledge are no longer as important," Shimizu [2007] agrees that aging has a predominantly negative effect.

For companies in the first section of the TSE, the impact of company size (LnAss) on corporate performance is negative, suggesting that as companies grow larger, their profit momentum wanes and thus lower their evaluation in the eyes of an investor. Regarding the impact of the size variable on Q, McCornel and Servas [1990, pp.605-607] state that "since insiders, such as corporate managers, easily own most of the company when the company size is small, company size and Q are inversely correlated." This means that as the company grows, the stake held by insiders decreases, leading to a lower evaluation by investors.

The effect of the EBITDA margin ratio on ROA was positive, but this relationship may be clear because both variables are profit figures. However, the effect of the EBITDA margin ratio on Q, which represents expectations to investors, was recognized only in the first section of the TSE. As Rozenbaum [2019, p.514,517] has pointed out, the EBITDA margin ratio is a profit figure that excludes factors such as depreciation, borrowing, and taxes, so it may be seen as an indicator that overlooks overinvestment and overpayment of taxes, making it less trusted by investors. Similarly, the relationship between the debt ratio (DASS) and ROA is consistently negative in four markets. This seems to be due to the causal chain where a reduction in the debt ratio leads to a reduction in interest payments, increasing profits.

Lastly, the strongest relationship was shown by the institutional investor shareholding ratio (INST), which showed a positive relationship with both ROA and Q in three markets, excluding TSE Mothers. However, while an increase in the institutional investor holding ratio increases ROA and Q, there is also a possibility that these corporate performance indicators increase, in turn, raising the institutional investor ratio. Nevertheless, Nitta [2008, pp.13-14] shows that "an increase in the institutional investor ratio has an effect that improves ROA", and this research supports this finding.

Conclusion

In this study, we examined the impact of the ratio of female executives on corporate performance. Although there was no evidence of an increase in profits due to these women, it became clear from the analysis targeting the first and second sections of the TSE that they are welcomed by investors due to recent expectations for management considering ESG. This

result is consistent with the previous study, Sakurada [2021]. It seems that managers are showing a willingness to meet the expectations of investors regarding the hiring of female directors.

Going forward, if the utilization of women in boards of directors becomes more widespread in our country, there is a possibility, as pointed out by Huang and Thiruvadi [2010], that organizations dominated by women may function differently from male-dominated ones. Aggressive and confrontational involvement in management due to the excessive strengthening of governance functions by women's participation, as indicated by Adams and Ferreira [2009], is not the only plausible approach. On the contrary, if results show that female talent in our country, compared to other countries, contributes more harmoniously and enhances corporate performance, it would be intriguing as a achievement unique to our country.

Considering the above, while we attempted an analysis using OLS (Ordinary Least Squares), the two-stage least squares method is frequently used when examining the impact of women's contributions on corporate performance. This is because while one might infer causality from the ratio of female executives affecting corporate performance, particularly ROA (Return on Assets), it is also conceivable that the quality of ROA might in turn influence the hiring of female executives. Therefore, in this study, it is necessary to recognize the re-examination using the two-stage least squares method as a remaining issue.

However, while for the estimation of ROA we believe that the two-stage least squares method is recommended due to the above-mentioned reverse causality, we don't think there's as strong a need to stick to this method when estimating Q. This is because, considering the current impact of ESG management on investor expectations, it is believed that hiring female executives can heighten investor expectations, thus having a stronger effect on Q. Conversely, the probability of hiring based on a high Q, or high investor expectations, seems low. An interesting point to note is the increase in the ratio of female executives, as Hatanaka and others [2023] pointed out using propensity score matching, may also be brought about by an increase in the ratio of external directors. Nevertheless, to discern the actual inversion of causality, the verification using the two-stage least squares method remains indispensable.

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[2] opere citato

[3] According to Harada and Tsunafuji [2005, pp.8], regarding scandals that occur in various companies and organizations regardless of industry in Japan and abroad, "The causes can be considered as the lack of corporate governance, inadequacy of compliance systems, lack of social responsibility, and absence of corporate ethics." They pointed out, "To prevent scandals, it is necessary to build an 'internal control system'." Also, according to Lee [2021, pp.89], "The causes of corporate scandals are not only factors of corporate governance such as a lack of supervision over the company or malfunction of internal controls but fundamentally also include the absence of ethics among managers and employees, the laxity in their perceptions, communication problems within the organization, and organizational culture."

[4] 「財務諸表監査における不正」日本公認会計士協会監査基準委員会 報告書第 40 号

[5] 本文中の CG の定義以外にも Tutino and Merlo[2019, p. 9]に依ると CG とは「詐欺や不正行為を回避するために企業が遵守しなければならない一連のルール、規制、およびポリシーである」とする。

[6] Masuda [2015, pp.32-33] has results similar to Shibano [2017, pp.102]. According to them, using data from listed companies from 2006 to 2015, the adoption of a ratio of external directors and the establishment of nomination committees and similar entities does not have a significant impact on the occurrence of accounting fraud.

[7] According to Morck et al [1988, pp.307-308], based on these results, the significance of the variables in the analytical model is higher for internal directors compared to external directors. It is concluded that external directors are granted incentives similar to those of internal directors. However, it is concluded that the significance of variables is stronger for internal directors compared to external directors, as internal directors tend to have salary, bonuses, and other motivation programs in place more so than external directors.