The Impact of Corporate Governance on Company Performance - Using Electronic Voting System as Mediator

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Abstract

In the past, participation in shareholders' meetings was limited to in-person attendance and proxy voting. However, with electronic voting, foreign investors and shareholders holding shares in multiple companies can participate in shareholders' meetings online, allowing shareholders to vote without time and place restrictions. The Financial Supervisory Commission R.O.C (Taiwan) also promotes various initiatives, such as implementing an independent director system, audit committee setup, board nomination system, electronic voting, and other measures to strengthen corporate supervision and improve corporate governance and shareholder activism. Electronic voting in shareholders' meetings may increase meeting attendance. Due to increased participation, companies require more credible professional institutions. Corporate governance is considered an important factor in improving economic effects and enhancing enterprise competitiveness. Additionally, shareholders' meetings involving director and supervisor re-elections tend to have higher attendance rates. Previous literature has indicated that companies with good corporate governance demonstrate better business performance. This study investigates the impact of corporate governance on operating performance after the implementation of electronic voting from 2014 to 2018 in companies that were required to implement electronic voting and re-elected directors and supervisors in the current year. The results show that corporate governance quality can improve company operating performance through the implementation of an electronic voting system.

Keywords: Corporate Governance, Electronic Voting, Operating Performance, Shareholder Activism

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1. Introduction

Corporate governance is a crucial infrastructure in international financial and capital market management. Beyond establishing internal governance structures through regulations and professional codes, the most effective method is to incorporate good corporate governance mechanisms into investment decisions by market investors. To achieve this goal, the market must possess assessment information that reflects the implementation status and effectiveness of corporate governance, enabling investors to make investment decisions and fully leverage market investor influence. Good corporate governance mechanisms help reduce agency problems between control rights and ownership, in other words, aligning the goals and interests of agents with principals (Masood and Ghodratollah, 2011).

In economic development, capital plays a vital role, with its most fundamental source being shareholders. Investors' primary goal is to pursue investment returns while bearing certain risks. Therefore, investors need to understand and grasp company operational information before deciding whether to invest, to evaluate investment returns and risks. Conversely, developing companies needing more capital should improve their corporate governance standards to increase investor confidence.

Regarding company operations and management, since shareholders cannot participate in company operations directly, shareholders as company owners express their opinions on business decisions by participating in shareholders' meetings through voting. Important operational decisions and personnel appointments must receive shareholders' meeting approval for resolutions to pass. Therefore, shareholders can only rely on exercising voting rights by attending shareholders' meetings to decide on major company matters. However, due to the excessive concentration of meeting dates, shareholders holding stocks in multiple companies cannot personally attend all shareholders' meetings. Although shareholders unable to attend in person can vote through proxy or choose to abstain, for internal directors holding minority shares, to obtain voting rights at shareholders' meetings for their own benefit, they may purchase or acquire proxies to compete for voting rights, resulting in proxy solicitation failing to achieve its original purpose.

With technological development and progress, many countries have begun implementing electronic voting for shareholders' meetings. The Financial Supervisory Commission announced that starting in 2018, all listed companies must include electronic voting systems as one of the voting channels for shareholders' meetings. In 2015, the Taiwan Depository & Clearing Corporation (TDCC) established the electronic voting platform "Stock vote" in cooperation with regulatory authorities. Shareholders only need to download this application and connect to the internet to vote using mobile phones, computers, tablets, or other electronic devices from any location. Many previous studies have explored whether corporate governance quality affects operational performance. Among them, Gompers (2003) found that companies with better corporate governance quality have higher company value, operational performance, and lower capital expenditure. Therefore, this study explores whether

the improvement of corporate governance through electronic voting as a mediating variable has a further impact on operational performance.

This study uses companies that were mandated to implement electronic voting and conducted director/supervisor re-elections during shareholders' meetings from 2014 to 2018 as research subjects. The results indicate that corporate governance evaluation has a positive impact on electronic voting; electronic voting shows a positive correlation with operational performance. Corporate governance has a positive relationship with operational performance; corporate governance has an indirect positive relationship with operational performance through electronic voting.

This manuscript continues with the following structure. The next section examines prior research and establishes our theoretical framework. The third section outlines our methodology, including data collection and variable definitions. Section four presents our analysis and findings. The paper concludes with a discussion of implications and closing remarks.

2. Literature Review and Hypothesis Development

2.1 Agency Theory

Agency theory refers to the contractual relationship between principals and agents. If principals and agents are from the same group, agency problems do not exist. However, when a company reaches a certain scale and becomes publicly listed, it will receive more external resources from shareholders (principals), but managers (agents) may use funds for matters benefiting themselves and not work as diligently as before, causing conflicts between shareholders and managers to gradually increase (Berle and Means, 1932). Additionally, when ownership and control rights are separated, managers only need to hold minority shares to control the company's overall resource operations (Claessens, Djankov, Fan & Lang, 2002; Fan & Wong, 2002). At this time, if company shareholders (principals) need to effectively monitor managers' (agents) operational performance, they achieve consensus through signing relevant contracts (Jensen & Meckling, 1976).

Most organizational contract structures limit the risks undertaken by most agents through specifying performance indicators, specific performance metrics, related fixed commitment returns, or incentives. The monitoring and control of these related contracts also generate agency costs (Fama & Jensen, 1983a). Jensen (1986) suggests that companies can use dividend distribution to reduce agents' free cash flow rights, promoting effective investment behavior by agents. Additionally, Ahmed and Duellman (2007) indicate that a higher proportion of external directors can increase company conservatism and reduce agency costs. Companies can also use accounting conservatism to constrain information asymmetry phenomena, reducing agents' incentives and abilities to manipulate earnings (Ho Su-Chiu, 2016).

Another type of contract involves residual claimants. Residual claimants receive payment only after all "fixed claimants" and "contractual claimants" have been paid, meaning agents' claims on company profits. Fama & Jensen (1983) found in their research on ownership and control rights that

in small businesses or companies with simpler organizational structures, distributing residual claim rights to agents can effectively align agents' goals with shareholders and have survival value due to bearing operational uncertainties. This is because it reduces monitoring costs and contract adjustment costs with other agent groups to bear continuously changing risk fees of other agents, thus increasing organizational survival value. Additionally, establishing independent directors can effectively reduce agency problems between control rights and ownership (Fama & Jensen, 1980).

The board of directors' main responsibility is to supervise company management operations. However, if board members are involved in company operations, they may prioritize their own interests over their supervisory duties. Therefore, to achieve effective supervision mechanisms, the Financial Supervisory Commission promotes the establishment of independent directors. Companies can introduce independent directors with different professional backgrounds, such as those with good external relationships and professional backgrounds, or those who can establish connections with specific external relationships or resources beneficial to company operations, thereby improving operational performance (Fama, 1980; Fama and Jensen, 1983) and enhancing internal supervision mechanisms (Dobrzynski, 1993).

While agency problems in Western countries primarily exist between principals and agents, in Asian countries, they mainly occur between major and minor shareholders. Cleassens, Djankov & Lang (2000) point out that only 26.20% of Taiwanese companies have dispersed ownership, indicating that most Taiwanese companies' ownership is concentrated in controlling shareholders' hands. Since most companies are family businesses with concentrated ownership structures, controlling shareholders with minority shares may make decisions benefiting themselves.

2.2 Corporate Governance

Corporate governance, also known as corporate management and supervision, refers to methods of company management and control. In a narrow sense, it is a charter system that refers to monitoring mechanisms that harmonize rights and responsibilities between owners and managers through reasonable methods. In a broad sense, it refers to using internal and external mechanisms to coordinate interest relationships between companies and suppliers or creditors. Corporate governance functions to create company value and fairly distribute value, where creating company value requires high-quality management conditions to operate the company and pursue long-term value increases.

Past definitions of corporate governance vary among domestic and international experts and scholars. Since 2004, the Organization for Economic Co-operation and Development (OECD) has emphasized that corporate governance mechanisms need to establish stakeholder rights through legal or contractual methods and clearly explain how supervision and regulation work between different units. From a social perspective, it refers to social organizations self-regulating internal systems and relationships under social law frameworks, using power to guide, control, and regulate company internal activities to promote group common interests (Prakash and Hart, 2000).

2.3 Literature on Corporate Governance's Impact on Company Performance

Agrawal & Knoeber (1996) found that insider shareholding, external directors, debt, and corporate control rights show positive correlations with company performance. Klapper and Love (2004) studied the impact of company-level governance on operational performance, market value, and external funding acquisition. Their research found that poorer corporate governance-related legal systems have more positive effects on market value and operational performance for companies with better corporate governance. Morey et al. (2009) used monthly report data to test whether the evolution of corporate governance ratings affects company market value, finding significant positive relationships between corporate governance ratings and company value. Gompers (2003) found significant positive relationships between corporate governance and equity returns.

Spellman and Watson (2009) investigated the economic implications of GMI (Governance Metrics International) governance ratings on both historical and prospective corporate performance from a shareholder perspective. Their findings demonstrated that implementing an investment strategy focused on acquiring stocks with superior GMI governance ratings generates above-market returns, establishing a straightforward and cost-effective investment decision methodology for market participants. In a related study, Allen (2009) demonstrated that firms exhibiting superior corporate governance frameworks attract heightened capital investment, primarily because investors maintain greater confidence in these entities' capacity to generate enhanced returns while simultaneously mitigating bankruptcy risk. The study further established a positive correlation between corporate value and operational performance metrics. Additionally, Agrawal and Knoeber (1996) empirical analysis revealed that increased independent director representation on corporate boards strengthens counterbalancing mechanisms against majority shareholders' influence, consequently enhancing operational performance indicators.

The contemporary electronic voting framework emerged from the convergence of two theoretical constructs: teledemocracy (Arterton, 1989) and cyberdemocracy (Bryan, Tsagarousianou, & Tambini, 1998). The fundamental value proposition of electronic voting systems centers on optimizing user accessibility while achieving procedural simplification and automation. A significant milestone occurred in March 2009 when the Taiwan Depository & Clearing Corporation (TDCC) implemented its proprietary electronic voting platform, designated "Stock-vote," designed to facilitate shareholder and corporate participation in the voting process. The operational framework requires publicly listed companies to execute a contractual agreement with TDCC prior to platform utilization. The procedural timeline mandates that companies must complete requisite documentation, including platform applications and shareholder information submissions, within a 30-45 day window preceding either regular or extraordinary shareholders' meetings. The platform enables shareholders to exercise their voting rights electronically during a prescribed period spanning from 29 days to 2 days prior to the scheduled meeting date. Final tabulation of electronic votes is conducted on the day preceding the shareholders' meeting.

3. Hypothesis Development

To improve corporate governance, the Financial Supervisory Commission has incorporated electronic voting as one of the voting channels for shareholders' meetings. This allows investors who previously couldn't personally participate in shareholders' meetings to vote through online platforms or apps. Investors can make voting decisions based on current company information and online information access. Under these circumstances, companies must provide more company-related information to improve transparency, which will enhance corporate governance quality, increase investors' understanding of the company, and boost company credibility.

Drabek & Payne (2002) found that companies' information transparency preferences can attract more foreign investors. Current scholars have found that companies with higher director and supervisor shareholdings are more likely to voluntarily adopt electronic voting, and company size also affects whether companies choose to voluntarily adopt electronic voting (Yang Jia-Feng, 2015). This research reflects that if companies continuously maintain and enhance corporate governance quality, the probability of voluntarily adopting electronic voting increases. This study predicts that improving company information and quality can encourage more investors to actively participate in shareholders' meeting voting, and in today's information technology era, will attract more foreign investors and those seeking convenience to use electronic voting methods. Therefore, this study explores whether companies with better corporate governance among listed companies mandated to implement electronic voting show increased electronic voting rates. We propose Research Hypothesis 1:

H1: Corporate governance has a positive impact on electronic voting rates.

In the past, shareholders' meeting dates were excessively concentrated, causing investors holding shares in multiple companies to only attend one company's shareholders' meeting while giving up others held on the same day. Although investors could exercise voting rights through proxies, this evolved into controlling shareholders increasing their voting rights through public acquisition or proxy solicitation, leading to controlling shareholders holding minority shares but wielding substantial control rights and ultimate company operational rights, easily causing agency problems between controlling shareholders and investors (Claessens, Djankov, Fan, & Lang, 2002). However, with electronic voting implementation, it becomes difficult for controlling shareholders to control shareholders' meeting final voting results through proxy solicitation and acquisition. Therefore, based on previous scholars' research results, we propose Research Hypothesis 2:

H2: Electronic voting has a positive impact on operational performance.

Companies can use many methods to improve corporate governance quality. For example, companies can increase external directors or establish audit committees to enhance supervision and management mechanisms (Chtourou. et al., 2001). External directors can provide different information to help companies handle problems, and companies disclosing complete information can improve information transparency and resolve investors' information asymmetry problems (Diamond,

1985; Verrecchia, 2001). Previous scholars have found that family enterprises' corporate governance quality is better than non-family enterprises and effectively improves company operational performance (Bartholomeusz and Tanewski, 2006), meaning family enterprises' high attention to company operations and management promotes good control and performance in both corporate governance and operations.

Regarding corporate governance's impact on company operational performance, there are two viewpoints: supportive and non-supportive. From the supportive perspective, previous scholar Black's (2001) analysis of 21 Russian firms revealed that the quality of corporate governance practices had a strong positive impact on firm valuation. His research demonstrated robust evidence that better-governed companies commanded higher market values.

Challenging the positive view, Epps (2008) examined the connection between governance practices and firm performance using data collected between 2002 and 2004. The study utilized ISS corporate governance scores as a governance metric, while measuring corporate performance through ROA and ROE indicators. The findings failed to establish any meaningful correlation between governance ratings and operational results. This evaluation system can also provide investors with reference for investment decisions, implying that enterprises can strengthen corporate governance quality to incentivize more investor participation. When companies with good corporate governance quality are willing to disclose relevant financial and non-financial information, market investor willingness relatively increases, and companies receive high attention, further leading to improved operational performance. Therefore, we propose hypothesis H3:

H3: Corporate governance has a positive relationship with operational performance.

Past proxy acquisitions caused controlling shareholders' ownership and control rights to deviate from the one-share-one-vote principle, easily producing adverse effects on company operational performance and minority shareholders' rights (Claessens, Djankov, & Lang, 2000; Porta, Lopez-de-Silanes, & Shleifer, 1999; Yeh, Lee, & Shu, 2007). Through electronic voting rates, agency problems can be reduced, and shareholders can actively participate in shareholders' meetings to exercise voting rights through electronic voting systems. This not only enhances shareholder activism but also demonstrates companies' attention to shareholders and strengthens corporate governance spirit. Finally, this study aims to improve corporate governance quality and hopes to enhance information transparency and company value through electronic voting system implementation, thereby improving company operational performance. Therefore, using electronic voting rates after mandatory implementation as a mediating variable, we propose hypothesis H4:

H4: Corporate governance has an indirect positive relationship with operational performance through electronic voting, that is, electronic voting is a mediating variable between "corporate governance and operational performance."

4. Data Sources and Variable Measurements

4.1 Data Sources

In 2012, Taiwan's Financial Supervisory Commission implemented new regulations to strengthen investor participation and governance standards. Under these rules, publicly traded companies meeting specific criteria - namely those with paid-in capital exceeding NT$10 billion and a shareholder base of more than 10,000 - were required to adopt electronic voting systems for shareholder meetings. In 2014, this threshold was lowered to paid-in capital of NT$5 billion or more and shareholders numbering over 10,000. In 2016, it was further lowered to paid-in capital of NT$2 billion or more and shareholders numbering over 10,000. In 2018, all listed companies were mandated to include electronic voting as one of the voting channels for shareholders' meetings. Additionally, this study considers that shareholder attendance rates are higher in years with director and supervisor re-elections compared to years without re-elections. In the corporate governance evaluation indicators, electronic voting system operations are included as bonus points and evaluation criteria. Furthermore, companies voluntarily adopting electronic voting received bonus points in the 2017 corporate governance evaluation. Therefore, for sample consistency, this study will use companies mandated to implement electronic voting as research subjects.

Corporate governance evaluation ratings have been published since the first period in 2014, with data obtained from the Taiwan Economic Journal (TEJ) database. Therefore, this study's sample period is set from 2014 to 2018, focusing on companies mandated to implement electronic voting and conducting director and supervisor re-elections in shareholders' meetings during that period. The sample period from 2014 to 2018 was selected because it represents a critical transition in Taiwan’s corporate governance history. Following the "Corporate Governance Roadmap" issued by the Financial Supervisory Commission (FSC), e-voting shifted from a voluntary practice to a mandatory requirement for listed companies in stages. This specific timeframe allows the study to capture the direct impact of the mandatory implementation of e-voting and its immediate effect on shareholder activism and firm performance during this regulatory shift.

Sample collection data for companies mandated to implement electronic voting was obtained from the "Database" section "Corporate Governance Statistics Related to Annual General Meetings" page on the Taiwan Stock Exchange's Corporate Governance Center website. Data regarding whether director and supervisor re-elections were conducted at shareholders' meetings was obtained from the Market Observation Post System (MOPS) under "Report Collection" → "Shareholders' Meetings and Dividends"→ "Shareholders' Meeting Announcements" → "Summary of Annual General Meeting Date, Location and Electronic Voting Implementation." Additionally, electronic voting rates were obtained from the MOPS "Basic Information" → "Electronic Books" → "Annual Reports and Shareholders' Meeting Related Materials (Including Depository Receipt Materials)" page under "Shareholders' Meeting Minutes" files.

The data collection process for electronic voting information required considerable effort because currently, there are no mandatory regulations or unified format for integrating "Shareholders' Meeting Minutes" in Taiwan. Some image files were unclear, so the accuracy of electronic voting information was limited in some cases. Regarding the accuracy of electronic voting (e-voting) data, although there is a lack of a unified format for "Shareholders' Meeting Minutes" in Taiwan, this study minimized data errors through a multi-channel verification process. In addition to manually identifying meeting minutes, we cross-referenced data with the "Electronic Books" section of the Market Observation Post System (MOPS) and statistical reports from the Taiwan Depository & Clearing Corporation (TDCC). Only companies with clearly disclosed and verifiable e-voting figures were included in the observations, ensuring the reliability of the e-voting rate variable.

Our study obtains data on shareholder meetings adopting the candidate nomination system from the Taiwan Stock Exchange. Data for market-to-book ratio (MTB), Tobin's Q, ROA, corporate governance evaluation ratings, company age, foreign shareholding ratio, total assets, and debt ratio were obtained from TEJ. Furthermore, the sample excludes special industries such as financial and insurance industries, first-listed stocks (stocks with KY in their names), second-listed stocks (stocks with DR in their names), and full-delivery stocks. After removing these characteristics and incomplete data samples, a total of 983 observations were retained.

4.2 Variable Measurements

This study has four research hypotheses. For Hypothesis 1, the dependent variable is electronic voting; for Hypotheses 2, 3, and 4, the dependent variable is company operational performance. For independent variables, except for Hypothesis 2 which uses electronic voting, Hypotheses 1, 3, and 4 use corporate governance. The mediating variable measurement for Hypothesis 4 is electronic voting. To control for other firm characteristics that may influence electronic voting rates and operational performance, we include several control variables: the adoption of a director candidate nomination system (expected to enhance voting convenience and governance), foreign shareholding ratio (a proxy for external monitoring), return on assets (a measure of profitability), company size (to account for scale effects), debt ratio (reflecting financial risk), and company age (representing the firm's life cycle). The definitions and measurement methods for each variable are explained as follows:

Market-to-Book Ratio (MTB): Market value / Book value. A higher ratio suggests greater growth opportunities and future value.

Tobin's Q: (Market value of equity + Long-term and short-term debt) / Total assets. This captures firm value, including intangible assets.

Electronic Voting Rate (E-VOTE): Electronic voting shares / Total outstanding shares. This is the mediating variable.

Corporate Governance Evaluation System (CGES): The independent variable, sourced from TEJ. The Corporate Governance Evaluation System (CGES), published by the Taiwan Stock Exchange, is a

comprehensive governance index that evaluates firms across multiple dimensions, including board structure, shareholder rights protection, information transparency, and ESG-related governance practices. The implementation of electronic voting is included as one of the evaluation criteria, but CGES reflects broader governance quality rather than voting behavior alone. CGES = A+ =3, A=2, B and below=1

Director Candidate Nomination System (DCNS): A dummy variable coded as 1 if the company adopted the candidate nomination system for director/supervisor elections in that year, and 0 otherwise.

Foreign Shareholding Ratio (FORN): The sum of shareholding by foreign individuals, corporations, and financial institutions.

Return on Assets (ROA): Pre-tax, pre-interest earnings / Average total assets.

Company Size (SIZE): The natural logarithm of total assets (Ln(Total Assets)). Larger firms may also face stronger scrutiny from investors and regulators, which can affect shareholder participation and firm performance. Larger firms tend to have more developed governance structures which may influence both governance practices and performance outcomes (Jensen & Meckling, 1976; Shleifer & Vishny, 1997).

Debt Ratio (DEBTS): Total debt / Total assets. Firms with higher leverage may experience stronger monitoring from creditors but may also face greater financial constraints that influence firm performance (Jensen, 1986).

Company Age (AGE): Observation year - Company founding year + 1.

5. Empirical Results

5.1 Descriptive Statistics

The sample statistics show that electronics-related industries dominate, which aligns with Taiwan's electronics-led industrial structure. From Table 1, among the variables measuring operational performance, the market-to-book ratio (MTB) has a mean of 1.70 with a maximum value of 13.51. Additionally, Tobin's Q, measuring company market value, has a mean of approximately 1.15, a median of about 0.88, and a maximum value of about 9.49, similar to the market-to-book ratio results, indicating that some companies' market values differ significantly from the majority.

Table 1. Descriptive Statistics

Variable	Mean	Stdev.	Minium	Q1	Median	Q3	Maximum
MTB	1.70	1.48	0.28	0.83	1.28	1.99	13.51
Tobin's Q	1.15	0.91	0.03	0.69	0.88	1.29	9.49
CGES	1.44	0.64	1.00	1.00	1.00	2.00	3.00
E-VOTE%	20.33	22.94	0.00	1.97	10.16	32.91	93.12
DCNS	0.75	0.44	0.00	0.00	1.00	1.00	1.00
FORN%	12.20	10.20	0.00	4.54	9.68	18.12	69.98
ROA	2.95	10.14	-115.99	-0.10	3.32	7.41	77.40
SIZE	16.10	1.72	11.43	14.84	16.04	17.17	21.94
DEBTS	42.75	18.56	0.90	29.10	43.86	55.51	97.52
AGE	33.57	14.38	1.00	22.00	31.00	44.00	73.00

Variables are defined as follows: MTB (Market-to-Book Ratio) = market value / book value; Tobin's Q = (market value of equity + total debt) / total assets; CGES (Corporate Governance Evaluation System score) = 3 for A+, 2 for A, 1 for B and below; E-VOTE% (Electronic Voting Rate) = electronic voting shares / outstanding shares; DCNS (Director Candidate Nomination System) = 1 if adopted, 0 otherwise; FORN% (Foreign Shareholding Ratio) = sum of foreign individual, corporate, and financial institution shareholding; ROA (Return on Assets) = pre-tax pre-interest earnings / average total assets; SIZE = natural log of total assets; DEBTS (Debt Ratio) = total debt / total assets; AGE = observation year - founding year + 1.

The corporate governance evaluation rating mean is approximately 1.44 (median about 1.00), indicating that most sample companies' corporate governance evaluation ratings fall between B, C, C-, D, and D- levels, suggesting that sample companies have medium to low corporate governance quality. The electronic voting rate (E-VOTE) mean is approximately 20.33% (median about 10.16%), indicating high shareholder willingness to participate in shareholders' meetings through the electronic voting platform. For control variables, the shareholder meetings adopting candidate nomination system (DCNS) mean is approximately 75% (median about 100%), indicating that about 75% of sample companies adopted the director and supervisor candidate nomination system at shareholders' meetings to help shareholders better understand candidates' backgrounds. The foreign shareholding ratio (FORN) mean is approximately 12.20% (median about 9.68%), return on assets (ROA) mean is about 2.95 (median about 3.32), company size (SIZE) mean is about 16.10 (median about 16.04), debt ratio (DEBTS) mean is about 42.75 (median about 43.86), and company age (AGE) mean is about 33.57 (median about 31), indicating that sample companies' ages mostly fall around 31 years. For other variables' standard deviations, minimum values, maximum values, etc., please refer to Table 2.

5.2 Correlation Analysis

Table 2 presents the correlation analysis results. First, corporate governance evaluation ratings show significant positive correlation with electronic voting rates, supporting Hypothesis 1. For Hypothesis 2, electronic voting rates show significant positive correlation with operational performance variables, indicating that higher shareholder meeting participation through electronic voting positively impacts operational performance. Hypothesis 3 shows that corporate governance has significant positive correlation with market-to-book ratio (MTB) and Tobin's Q, indicating that

companies with good corporate governance quality also see improvements in market-based measures MTB and Tobin's Q.

Additionally, company age shows significant positive correlation with company size and debt ratio, indicating that longer-operating companies tend to have larger size and higher debt. Simultaneously, shareholder meetings adopting candidate nomination system shows significant positive correlation with corporate governance evaluation ratings, indicating that adopting candidate nomination system effectively improves corporate governance evaluation ratings. Foreign shareholding ratio shows significant positive correlation with electronic voting rates and negative correlation with debt ratio, indicating that companies with higher foreign shareholding have high. Foreign ownership percentage shows a significant positive correlation with electronic voting rates and a negative correlation with debt ratio. This indicates that companies with higher foreign ownership tend to have higher rates of electronic voting participation in shareholders' meetings, and it can also be observed that companies with more foreign investors maintain lower debt ratios.

Table 2. Pearson Correlation Coefficients

	1	2	3	4	5	6	7	8	9	10
1.MTB	1									
2.Tobin’s Q	0.82***	1								
3.CGES	0.20***	0.16***	1							
4.E-VOTE	0.21***	0.16***	0.33***	1						
5.DCNS	0.05	0.01	0.19***	0.26***	1					
6.FORN	0.20***	0.19***	0.12***	0.18***	0.08***	1.				
7.ROA	0.23***	0.11***	0.04	0.19***	0.04	0.13***	1			
8.SIZE	-0.09***	-0.18***	0.29***	0.39***	0.22***	0.05	0.16***	1		
9.DEBTS	-0.03	-0.27***	0.04	-0.02	0.00	-0.05	-0.15***	0.32***	1	
10.AGE	-0.19***	-0.24***	-0.13***	-0.08**	-0.06*	-0.13***	0.01	0.28***	0.18***	1

Definitions for MTB, Tobin's Q, CGES, E-VOTE, DCNS, FORN, ROA, SIZE, DEBTS, and AGE are consistent with those provided in Table 1. *, **, and *** indicate statistical significance at the 0.1, 0.05, and 0.01 levels, respectively. n=364.

5.3 Multiple Comparisons

According to the univariate analysis results of corporate governance evaluation ratings, electronic voting participation rates, and operational performance shown in Table 3, firms with A+ governance ratings demonstrated superior performance compared to those rated A. These A+ rated companies also significantly outperformed firms rated B, C, C-, D, and D-, with differences being statistically significant at the 1% or 5% levels.

Table 3. Multiple Comparison Analysis of Corporate Governance Evaluation Ratings with Electronic Voting Rates and Operational Performance

	CGES	n	Mean	F-vale	Scheffe's Test
E - VOTE	1	627	15.14%	63.59***	2>1***
	2	279	26.33%		3>1***
	3	77	40.95%		3>2***
MTB	1	627	1.5233	26.721***	2>1**
	2	279	1.7982		3>1***
	3	77	2.7745		3>2***
Tobin's Q	1	627	1.0616	15.538***	2>1*
	2	279	1.2063		3>1***
	3	77	1.6505		3>2***

This table presents the mean E-VOTE, MTB, and Tobin's Q for three groups based on CGES scores: Group 1 (CGES=1, lower governance), Group 2 (CGES=2, moderate governance), and Group 3 (CGES=3, higher governance). The F-statistic tests for overall differences among the group means. Scheffe's post-hoc test identifies which specific groups are significantly different from each other. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

5.4 Regression Analysis

5.4.1 Corporate Governance's Positive Impact on Electronic Voting

The M2 in Table 4 using. regression examines Hypothesis 1 regarding corporate governance's impact on electronic voting. Corporate governance (0.177) shows a significant positive value, indicating that higher corporate governance quality encourages shareholders to more actively use the electronic voting platform to exercise voting rights. For control variables, shareholder meetings adopting candidate nomination system (0.132), foreign shareholding ratio (0.101), return on assets (0.087), and company size (0.365) all show significant positive correlations, indicating that listed companies' willingness to adopt candidate nomination system, higher foreign investment ratio, better return on assets, and larger company size correlate with higher electronic voting rates. Additionally, electronic voting rates show negative correlations with debt ratio (-0.115) and company age (-0.127), indicating that lower debt ratios and younger companies correlate with higher electronic voting rates. All variable results align with our research expectations.

Table 4. Regression Analysis Results of Corporate Governance Impact on Electronic Voting

	DCNS	FORN	ROA	SIZE	DEBTS	AGE	CGES	Adj -R^2	F
M1	0.15 ***	0.114 ***	0.082 **	0.426 ***	-0.12 ***	-0.164 ***		0.258	57.883 ***
M 2	0.132 ***	0.101 ***	0.087 **	0.365 ***	-0.115 ***	-0.127 ***	0.177 ***	0.284	56.607 ***

Variables are defined as follows: MTB (Market-to-Book Ratio) = market value / book value; Tobin's Q = (market value of equity + total debt) / total assets; CGES (Corporate Governance Evaluation System score) = 3 for A+, 2 for A, 1 for B and below; E-VOTE% (Electronic Voting Rate) = electronic voting shares / outstanding shares; DCNS (Director Candidate Nomination System) = 1 if adopted, 0 otherwise; FORN% (Foreign Shareholding Ratio) = sum of foreign individual, corporate, and financial institution shareholding; ROA (Return on Assets) = pre-tax pre-interest earnings / average total assets; SIZE = natural log of total assets; DEBTS (Debt Ratio) = total debt / total assets; AGE = observation year - founding year + 1. Standardized beta coefficients are reported, with t-statistics in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

5.4.2 Electronic Voting's Positive Impact on Operational Performance

The M4 in Table 5, using market-to-book ratio as the operational performance measure, shows electronic voting rate has a significant positive correlation (0.221) with market-to-book ratio, indicating companies with higher electronic voting rates show better operational performance. For control variables, foreign shareholding ratio (0.135) shows a significant positive coefficient, indicating companies with higher foreign shareholding have higher market-to-book ratios; return on assets (0.228) shows a significant positive coefficient, indicating listed companies with better asset utilization have higher market-to-book ratios; company size (-0.232) shows a significant negative coefficient, indicating smaller companies have higher market-to-book ratios; debt ratio (0.106) shows a significant positive coefficient, indicating higher debt correlates with higher market-to-book ratios; company age (-0.113) shows a significant negative coefficient, indicating younger companies have higher market-to-book ratios.

The M6 in Table5, using Tobin's Q as the operational performance measure, shows electronic voting rate has a significant positive correlation (0.188) with Tobin's Q, indicating higher electronic voting rates correlate with higher Tobin's Q. Control variable results align with the market-to-book ratio findings, except for debt ratio showing a significant negative coefficient, indicating companies with higher debt have lower Tobin's Q. Our research Hypothesis 2 regarding electronic voting rate's positive impact on both market-to-book ratio and Tobin's Q is supported.

Table 5. Analysis of the Impact of Electronic Voting and Corporate Governance on Operational Performance

Panel A: Results of Electronic Voting's Impact on Operational Performance

	DCNS	FORN	ROA	SIZE	DEBTS	AGE	CGES	Adj-R^2	F
M 3	0.054 *	0.160 ***	0.246 ***	-0.138 ***	0.079 ***	-0.149 ***		0.127	24.89 ***
M 4	0.021	0.135 ***	0.228 ***	-0.232 ***	0.106 ***	-0.113 ***	0.221 ***	0.163	28.258 ***
M 5	0.012	0.161 ***	0.086 **	-0.101 ***	-0.192 ***	-0.156 ***		0.146	29.015 ***
M 6	-0.017	0.14 ***	0.07 **	-0.181 ***	-0.170 ***	-0.125 ***	0.188 ***	0.171	30.025 ***

Panel B: Results of Corporate Governance Impact on Operational Performance

	DCNS	FORN	ROA	SIZE	DEBTS	AGE	CGES	Adj-R^2	F
M 3	0.054 *	0.160 ***	0.246 ***	-0.138 ***	0.079 **	-0.149 ***		0.127	24.89 ***
M 7	0.032	0.144 ***	0.253 ***	-0.212 ***	0.085 **	-0.103 ***	0.218 **	0.167	29.146 ***
M 5	0.012	0.161 ***	0.086 **	-0.101 **	-0.192 ***	-0.156 ***		0.146	29.015 ***
M 8	-0.007	0.148 ***	0.091 **	-0.163 ***	-0.188 ***	-0.117 ***	0.184 ***	0.174	30.57 ***

Variables are defined as follows: MTB (Market-to-Book Ratio) = market value / book value; Tobin's Q = (market value of equity + total debt) / total assets; CGES (Corporate Governance Evaluation System score) = 3 for A+, 2 for A, 1 for B and below; E-VOTE% (Electronic Voting Rate) = electronic voting shares / outstanding shares; DCNS (Director Candidate Nomination System) = 1 if adopted, 0 otherwise; FORN% (Foreign Shareholding Ratio) = sum of foreign individual, corporate, and financial institution shareholding; ROA (Return on Assets) = pre-tax pre-interest earnings / average total assets; SIZE = natural log of total assets; DEBTS (Debt Ratio) = total debt / total assets; AGE = observation year - founding year + 1. Standardized beta coefficients are reported, with t-statistics in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

5.4.3 Corporate Governance's Positive Relationship with Company Operational Performance

The M8 in Table 5 examine corporate governance evaluation ratings' impact on company operational performance (market-to-book ratio and Tobin's Q). Results show corporate governance evaluation ratings have significant positive correlations with both market-to-book ratio (0.218) and Tobin's Q (0.184), indicating companies with higher corporate governance evaluation ratings show better operational performance, supporting Hypothesis 3.

5.4.4 Corporate Governance's Positive Relationship with Operational Performance through Electronic Voting

Table 6 examines the causal relationship between corporate governance evaluation ratings and company operational performance through electronic voting rates. With market-to-book ratio as dependent variable, F-value is 29.843, and with Tobin's Q as dependent variable, F-value is 39.917, both reaching 0.1% significance level, indicating effective regression. Comparing Table 11's Models 7 and 9, corporate governance evaluation ratings' standardized regression coefficient on operational performance decreases from 0.218 (0.1% significance level) to 0.186 (still at 0.1% significance level). According to Baron and Kenny's (1986) causality criteria (i.e., BK causality method), this indicates corporate governance evaluation ratings indeed have an indirect positive impact on operational performance through electronic voting rates, showing partial mediation effects.

Additionally, with Tobin's Q as dependent variable, comparing the previous Table, the independent variable's standardized regression coefficient on dependent variable decreases from 0.184 (0.1% significance level) to 0.156 (still at 0.1% significance level), indicating results consistent with market-to-book ratio, thus electronic voting rates show partial mediation effects for both measures. Companies with higher shareholding ratios and higher return on assets demonstrate better operational performance. There are significant negative correlations with company size (-0.163), debt ratio (-0.188), and company age (-0.117), indicating that companies with smaller size, lower debt ratios, and shorter operating histories tend to achieve better operational performance.

The empirical results indicate that e-voting serves as a partial mediator rather than a full mediator. This suggests that while e-voting enhances performance by reducing geographical barriers and fostering shareholder activism, it is not the sole channel. According to the internal governance framework, other mechanisms such as the proportion of independent directors, the establishment of audit committees, and information transparency also play significant roles in improving firm value. The partial mediation effect confirms that e-voting is a vital technological tool that complements traditional governance structures to mitigate agency problems.

Table 6. Regression Analysis Results of Electronic Voting Mediation Effects

	DCNS	FORN	ROA		SIZE		DEBTS		AGE		CGES		EVOTE	Adj-R²	F
M7	0.032	0.14	0.25	***	-0.21	***	0.08	***	-0.10	***	0.21	***		0.16	29.14***
M9	0.008	0.12	0.23	***	-0.27	***	0.10	***	-0.08	**	0.18	***	0.18***	0.19	29.84***
M8	-0.007	0.14	0.09	**	-0.16	***	-0.18	***	-0.11	***	0.18	***		0.17	30.57***
M10	-0.027	0.13	0.07	**	-0.22	***	-0.17	***	-0.09	**	0.15	***	0.15***	0.19	29.91***

*Following the recommendations of Baron & Kenny (1986), the verification of mediation effects require a four-step regression analysis process: Test 1: Regression analysis of the independent variable on the mediator variable; Test 2: Regression analysis of the mediator variable on the dependent variable; Test 3: Regression analysis of the independent variable on the dependent variable: Regression analysis of both the independent variable and mediator variable on the dependent variable When all the above conditions are satisfied, mediation effects are present. If the effect of the independent variable on the dependent variable becomes non-significant after including the mediator variable, this indicates full mediation (Full mediation). If the standardized regression coefficient of the independent variable's effect on the dependent variable decreases, this indicates partial mediation (Partial mediation).

** Variables are defined as follows: MTB (Market-to-Book Ratio) = market value / book value; Tobin's Q = (market value of equity + total debt) / total assets; CGES (Corporate Governance Evaluation System score) = 3 for A+, 2 for A, 1 for B and below; E-VOTE% (Electronic Voting Rate) = electronic voting shares / outstanding shares; DCNS (Director Candidate Nomination System) = 1 if adopted, 0 otherwise; FORN% (Foreign Shareholding Ratio) = sum of foreign individual, corporate, and financial institution shareholding; ROA (Return on Assets) = pre-tax pre-interest earnings / average total assets; SIZE = natural log of total assets; DEBTS (Debt Ratio) = total debt / total assets; AGE = observation year - founding year + 1. Standardized beta coefficients are reported, with t-statistics in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

6. Conclusions

This study examines the mediating role of electronic voting in the relationship between corporate governance and firm operational performance. Using a sample of Taiwanese listed companies from 2014 to 2018 that were required to implement electronic voting and conduct director re-elections, the empirical results support all proposed hypotheses. Corporate governance quality is positively associated with electronic voting participation, and higher electronic voting rates are linked to better operational performance. In addition, corporate governance has a direct positive impact on firm performance. The results show that electronic voting partially mediates the relationship between corporate governance and firm performance. Electronic voting functions as an important mechanism through which good governance enhances firm outcomes by strengthening shareholder participation and monitoring. The finding of partial mediation suggests that electronic voting represents one of several mechanisms through which corporate governance affects firm performance. Other channels, such as improved information transparency, enhanced board monitoring, and stronger external monitoring, may also play important roles. Therefore, the partial mediation result is consistent with a multi-channel governance-performance framework.

This study makes several contributions. Theoretically, it extends the corporate governance literature by identifying and empirically testing electronic voting affects firm performance. By demonstrating partial mediation, it opens avenues for future research to explore other concurrent mechanisms, such as changes in information disclosure quality, increased engagement from institutional investors, or enhanced external scrutiny. Practically, our findings validate the FSC's policy of mandating electronic voting. The results show that this policy not only empowers

shareholders but also contributes to improving the performance of listed companies, thereby supporting Taiwan's economic development. Nevertheless, several limitations should be noted. First, electronic voting data were manually collected from shareholders' meeting minutes because standardized electronic disclosure formats were not yet fully established during the sample period, which may introduce measurement noise. Second, the sample period (2014–2018) focuses on the early stage of mandatory electronic voting implementation in Taiwan, which may limit generalizability to later periods. Future studies could also extend the timeframe to include years after the full mandate (post-2018) and compare results with companies that voluntarily adopted electronic voting earlier. Third, while the regression results indicate strong associations, potential endogeneity concerns remain and the findings should be interpreted as associative rather than strictly causal. Future research may extend the sample period, employ more advanced econometric methods to address endogeneity, or explore additional mechanisms such as information transparency or investor monitoring.

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