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The impact of audit committee structure and members on voluntary disclosure sections in the context of corporate governance



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Abstract

Voluntary disclosure is a vital mechanism by which firms can signal their credibility and legitimacy to current and prospective stakeholders. Corporate governance structures significantly influence the extent and frequency of such disclosures. This study investigates the role of audit committees in shaping the voluntary disclosure practices of 83 firms listed on the Public Disclosure Platform from 2010 to 2020. The analysis focuses on whether the mere presence of an audit committee or its proportional characteristics impacts voluntary disclosures differently. The findings reveal that audit committees play a substantial role in enhancing voluntary disclosure levels. Furthermore, the study highlights a notable distinction between the effects of the existence of the committee and its proportional representation in corporate governance.

Keywords

Corporate governance · Audit committee: Voluntary Disclosure Sections · Demographic characteristics · Panel data analysis



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1. Introduction

According to the Association of Certified Fraud Examiners (2018), companies lose 5% of their annual revenues and \$4 trillion worldwide due to accounting and financial market manipulation, multiple types of fraud, and corporate bankruptcies within the scope of financial scandals. In today's rapidly evolving global economy, the role of information disclosure has become increasingly significant in fostering transparency, accountability, and trust between firms and their stakeholders. Information asymmetry, as outlined by Verrecchia (1983), creates challenges for investors and decision-makers, often leading to adverse selection problems, such as the formation of "lemon markets" where bad investments are valued as much as good ones (Healy & Palepu, 2001). To address these challenges, firms employ both mandatory and voluntary disclosure mechanisms, with the latter gaining prominence as a corporate governance tool aimed at enhancing transparency, reducing information asymmetry and improving decision-making (Srinidhi et al., 2011).

Voluntary disclosure represents managers' discretionary choice to provide financial and non-financial information in annual reports to meet the needs of decision-makers (Meek et al., 1995). This approach not only enhances corporate governance by promoting transparency and accountability and improves legitimacy with shareholders, stakeholders and society (Davis, 2005). Furthermore, voluntary disclosure practices have been linked to better firm performance and more informed investment decisions, particularly in emerging markets where regulatory frameworks are still maturing.

Despite its benefits, the extent and quality of voluntary disclosure are influenced by the characteristics of boards and audit committees. Rouf and Akhtaruddine (2018) stated that factors such as gender, age, educational background, professional expertise and independence of audit committee members significantly shape their decisions regarding disclosure practices. These attributes influence not only the presence of voluntary disclosures, but also their depth and comprehensiveness.

This study explores the impact of audit committee composition on voluntary disclosure practices in Turkey, an emerging market characterized by unique economic and regulatory dynamics. Specifically, this research addresses two key questions: (1) Which demographic and personal characteristics of audit committee members affect the different sections of voluntary disclosure? (2) How does the presence and proportion of these characteristics influence disclosure outcomes? The analysis posits that the proportional representation of certain attributes, such as gender diversity, may have a stronger impact than their mere presence on disclosure quality.

The empirical framework of this study analyzes data from 83 non-financial companies listed on the Public Disclosure Platform in Turkey from 2010 to 2020. Using Barako's (2007) voluntary disclosure checklist, which includes 47 items across four sections (general and strategic information, financial information, forward-looking information, and social and board information), two models were developed. The first examines variables influencing the level of voluntary disclosure and the second investigates factors affecting proportional representation in disclosure practices.

This study makes several important contributions to the literature. First, it provides evidence of how the composition of audit committees influences various dimensions of voluntary disclosure. For example, the presence of female members affects the disclosure of general and strategic information, whereas their proportional representation enhances social and board information disclosure. Second, it examines underexplored attributes such as educational background, professional expertise, and age to address gaps

in the existing literature. Finally, by focusing on Turkey, the study highlights the interplay between voluntary disclosure and emerging market characteristics, offering valuable insights for researchers and practitioners.

By addressing these critical gaps, the findings have important implications for policymakers, corporate governance structures and future research. The subsequent sections provide an overview of the relevant literature, develop the hypotheses, outline the research design, and discuss the findings and their implications.

The article consists of six sections. The second and third sections present the literature and hypotheses on voluntary disclosure. The fourth section includes the research design and model selection. The fifth and sixth sections present the results of the analyses, and the seventh section presents the conclusion and discussion.

2. Literature review of the voluntary disclosure and audit committee

Disclosure is at the center of modern reporting, with voluntary disclosures included in annual reports as an important tool to communicate a firm's performance and governance to investors and stakeholders (Alyousef and Alsughayer, 2021). Voluntary disclosure plays a critical role in bridging information asymmetry in capital markets (Frenkel et al., 2020). Factors such as corporate control, stock compensation, increased analyst coverage, management signaling, and limitations on mandatory disclosures motivate firms to voluntarily disclose information (Shehata, 2014). Such disclosures shape stakeholders' perceptions and influence various aspects of firm performance (Saha and Kabra, 2020).

Extensive research supports the idea that voluntary disclosure benefit firms in many ways. For example, Diamond and Verrechia (1991) argued that increased transparency increases the liquidity of securities and reduces capital costs by attracting larger investors. Similarly, Botosan (1997) and He et al. (2019) showed that higher levels of disclosure reduce the cost of equity capital. More recently, Francis et al. (2008) confirmed that voluntary disclosures are associated with an overall reduction in the cost of capital, while Francis et al. (2005) emphasized their importance for companies seeking external financial support, showing a positive impact on company performance. Bolton and Kacperczyk (2021) argued that disclosures in publicly traded companies lead to lower stock-level uncertainty.

Other studies have examined specific determinants of voluntary disclosure. For example, Healy et al. (1999) linked disclosure levels to stock returns, institutional ownership, and stock liquidity. Scaltrito (2016) emphasized the role of firm size and audit quality, whereas Jullobol and Sartmool (2015) and Hamrouni et al. (2015) identified correlations with market-based and accounting-based performance measures. Reidenbach (2024) stated that more voluntary disclosures are made in an industry with a high litigation rate and in companies with high levels of organizational conflict. Boateng et al. (2022) showed that audit type affects the disclosure of financial and forward-looking information.

Corporate governance is a central factor that influences voluntary disclosure practices. Effective governance mechanisms reduce managerial opportunism and promote transparency (Enache and Hussainey, 2020). El-Deed et.al. (2021) showed that corporate governance has a positive impact on the level and tone of disclosure. Key governance attributes such as board structure, committee composition, ownership type, company size, and company age significantly shape disclosure levels. However, the diversity of governance practices across countries and cultural contexts makes it difficult to identify universally effective structures.

Corporate Governance Principles (2020) stipulate that boards of directors may establish subcommittees to fulfill their duties and responsibilities in a healthy manner. One of the sub-committees is the audit committee. The audit committee is a permanent committee established to oversee and monitor the internal control and audit activities of the firm (Altawalbeh, 2020). Dezoort et al. (2002) stated that four main factors determine the effectiveness of an audit committee. These include an adequate number of members, the experience and independence of the committee members, motivation, and a clear specification of duties and responsibilities.

Voluntary disclosures are influenced by the characteristics of its members and committees because they are not affiliated with a specific board like mandatory disclosures (Tsang et al., 2019). For example, O'Shaughnessy et al. (2022) stated that voluntary disclosures can be used as an indicator of the effectiveness and reliability of an audit committee because the committee can be sued in case of negligence or misconduct. Arcay and Vázquez (2005) emphasized the importance of audit committees, whereas Al-Janadi et al. (2013) emphasized the role of audit quality. Madi et al. (2014) and Persons (2009) showed that the independence and size of committee members and the frequency of their meetings positively affect disclosure levels. In addition, Laksman (2008) found that independent compensation committees disclose more information about executive compensation practices. Dzaraly et al. (2018) found a positive relationship between audit committee size and the disclosure of strategic and forward-looking information. Umaru et al. (2021) showed a significant positive relationship between banks with financial expertise in audit committees and voluntary disclosure. However, Al Amosh and Khatib (2021) did not find any significant relationship between ESG disclosures and the audit committee.

3. Hypothesis development

3.1. Female members on the audit committee

According to Johnson et al. (2013), the different characteristics of men and women affect the dynamics and decision-making on boards and committees, which in turn affect firm-level outcomes. They also have a significant impact on the audit committee because female members are better at monitoring and more committed to ethical rules (Oradi and Izadi, 2020). There is a positive relationship between gender-diverse audit committees and voluntary disclosure (Aisyah and Rahmawati, 2022) and voluntary corporate social reporting disclosure (Appuhami and Tashakor, 2017). In addition, Ud Din et al. (2021) found that having female members with financial expertise on the audit committee improves a firm's financial reporting quality and corporate governance mechanisms.

H1: There is a relationship between the presence of female members in the audit committee and the voluntary disclosure sections.

H2: There is a relationship between the ratio of female members in the audit committee and voluntary disclosure sections.

3.2. Independent members on audit committee

According to Patelli and Prencipe (2007), for managers to establish an equal and impartial relationship with stakeholders and shareholders and to prevent subjective behavior of its members, boards and committees should include independent members who are neither in a management role nor have ownership ties with the firm to prevent damage to the corporate governance structure. There is a strong relationship

between audit committees with independent members and voluntary disclosure (Madi et al., 2014, Samaha et al., 2015) and voluntary financial disclosure (Setiany et al., 2017). According to Akhtaruddin and Haron (2010), the negative relationship between managerial ownership and voluntary disclosure decreases with independent audit committees.

H3: There is a relationship between having independent members on the audit committee and voluntary disclosure sections.

H4: There is a relationship between the ratio of independent members in the audit committee and voluntary disclosure sections.

3.3. Average ages of audit committee members

Rhodes (1983) argued that the psychosocial effects of age have an impact on the attitudes and behaviors of board and committee members. According to Kang et.al. (2007), older members provide experience and economic resources, middle-aged people work in positions of responsibility, and young people have the energy and strength to make future plans, indicating that the contribution of each age group to the organization is different. Hafsi and Turgut (2013) stated that younger managers are more attuned to environmental and ethical issues; therefore, younger boards and committees may make more voluntary disclosures to ensure firm transparency.

H5: There is a relationship between the average age of the audit committee and voluntary disclosure sections.

3.4. Education level of audit committee members

Education has an impact on individuals' behavior and decision-making mechanisms. Cooke and Wallance (1990) stated that an increase in the education level will increase organizational accountability. According to Ma et al. (2020), managers with academic training have better ethical behavior, a tendency to be rigorous, and the ability to understand and interpret complex information than managers without academic training. This expectation is reinforced by studies showing a positive relationship between boards with financial education (Sweiti, 2017), CEOs (Lewis et.al., 2014), and CFOs (Akhtaruddin and Rouf, 2012) with higher levels of education and voluntary disclosure.

H6: There is a relationship between audit committee members' level of education and voluntary disclosure.

H7: There is a relationship between audit committee members' level of education and voluntary disclosure sections.

3.5. Audit committee size

An adequate number of committees can make adequate disclosures. However, there is no clear relationship between committee size and disclosure in the literature. However, since a sufficient number of committees can perform better monitoring (John and Senbet, 1998) and communication between them can be stronger, this will increase the level of disclosure. There are studies showing a relationship between committee size and corporate social disclosures (Al Amosh and Khatib, 2021) and voluntary disclosure (Munther, 2019; Agyei-Mensah, 2019).

H8: There is a relationship between audit committee size and voluntary disclosure levels.

3.6. Foreign members on the audit committee

It is thought that firms with foreign members may endeavor to provide better monitoring and corporate transparency (Oxelheim and Randøy, 2003). In addition, foreign members can add value to the board of directors and audit committees because of their different experiences (Muttakin et al., 2015). In particular, foreign directors' experience abroad and their business relationships there enable the internationalization of domestic firms (Sambharya, 1996) and therefore support firms to disclose additional information to attract foreign investors (Md Zaini et.al., 2018).

H9: There is a relationship between having foreign members on the audit committee and the sections of the voluntary disclosure list.

H10: There is a relationship between the ratio of foreign members in the audit committee and the voluntary disclosure list sections.

3.7. Professional audit committee expertise

Board and committee members with professional expertise are better positioned to resolve disputes between management and shareholders and stakeholders (Mangena and Tauringana, 2007) and to implement capital market innovations and communicate the firm's value criteria (Li et.al., 2012). According to Ji et al. (2015), audit committees with financial expertise are more successful in identifying internal audit deficiencies of the firm. Studies have demonstrated a positive relationship between accounting expertise and forward-looking disclosure practices, especially the disclosure of financial and strategic information (Abad and Bravo, 2018, Bravo and Alcaide-Ruiz, 2019). Mukti (2018) found that committees with legal expertise disclose more earnings information.

H11: There is a relationship between the presence of financial, accounting, or legal expert members in the audit committee and voluntary disclosure sections.

H12: There is a relationship between the ratio of financial, accounting, or legal expert members on the audit committee and voluntary disclosure sections.

3.8. Frequency of audit committee meetings

According to Abbott et al. (2003), boards and committees that meet more are frequently used as an important tool to improve monitoring and control effectiveness. There are studies showing a positive relationship between meeting frequency and voluntary internal control reports (Bronson et.al, 2006), online corporate financial reporting (Kelton and Yang, 2008), disclosure of remuneration committee practices (Laksmana, 2008), and disclosure of forward-looking information (O'Sullivan et.al., 2008).

H13: There is a relationship between the frequency of audit committee meetings and voluntary disclosures.

4. Research design

Two models, Model 1 and Model 2, were used in this research. Model 1 shows the level of disclosure of the voluntary disclosure sections. Model 2 shows the voluntary disclosure rates.

4.1. Sample determination

In this research, companies in the Public Disclosure Platform, which can make public disclosures in accordance with the capital market and stock exchange legislation in Turkey, were preferred as the sample.

There are 500 companies from different sectors on the platform. In the sample determination process, financial, investment trusts, holdings, banks, and real estate investment trust companies were excluded. Then, we checked whether the remaining companies had annual reports on their websites between 2010 and 2020. At the end of these two stages, 83 companies constituted the sample. In our research, the annual reports of 83 non-financial companies published on their websites for the years 2010-2020 were analyzed.

The voluntary disclosure checklist of Barako (2007) was used in this study. The checklist consists of 4 sections, including general and strategic information, financial information, future information, social and board information, and 47 questions, and the checklist is shown in Appendix A.

4.2. Definition of variables and research model

Table 1 shows the definitions and measurements of the variables in Model 1, which shows the level of voluntary disclosure. The CVs of the members in their annual reports are used to determine educational level and professional expertise. In determining professional expertise, the faculty/department from which they graduated and their position in the firm were taken into consideration, if specified in the CV. Education level was divided into four subgroups: high school (HEDAC), university (GEDAC), master's degree (PEDAC), and doctorate (PeEDAC) and included in the analysis. Professional Expertise of Audit Committee Members (EXAC) is measured under three sub-headings: financial (FeEXAC), accounting (AcEXAC), and legal (LaEXAC) expertise. The measurement of other variables is shown in Table 1. Because the voluntary disclosure list consists of four headings, Model 1 consists of four main regression equations.

$$GSIL = \alpha + \beta_1 FMAC + \beta_2 SAC + \beta_3 PhEDAC + \beta_4 PEDAC + \beta_5 GEDAC + \beta_6 HEDAC + \beta_7 FeEXAC + \beta_8 AcEXAC + \beta_9 LaEXAC + \beta_{10} FoMAC + \beta_{11} IMAC \quad (1)$$

$$FIL = \alpha + \beta_1 FMAC + \beta_2 SAC + \beta_3 PhEDAC + \beta_4 PEDAC + \beta_5 GEDAC + \beta_6 HEDAC + \beta_7 FeEXAC + \beta_8 AcEXAC + \beta_9 LaEXAC + \beta_{10} FoMAC + \beta_{11} IMAC \quad (2)$$

$$FLIL = \alpha + \beta_1 FMAC + \beta_2 SAC + \beta_3 PhEDAC + \beta_4 PEDAC + \beta_5 GEDAC + \beta_6 HEDAC + \beta_7 FeEXAC + \beta_8 AcEXAC + \beta_9 LaEXAC + \beta_{10} FoMAC + \beta_{11} IMAC \quad (3)$$

$$SBDIL = \alpha + \beta_1 FMAC + \beta_2 SAC + \beta_3 PhEDAC + \beta_4 PEDAC + \beta_5 GEDAC + \beta_6 HEDAC + \beta_7 FeEXAC + \beta_8 AcEXAC + \beta_9 LaEXAC + \beta_{10} FoMAC + \beta_{11} IMAC \quad (4)$$

Table 1
Identification of the Variables Used in Model 1

Variables	Code	Definition	Measurement
Dependent Variable			
General and strategic information levels	GSIL	Score obtained by the company from the scale.	If an item of the relevant segment is included in the annual report, a value of 1 is given; otherwise, a value of 0 is given.
Financial Information Level	FIL		
Forward-looking Information Level	FLIL		
Social and Board of Directors Information Level	SBDIL		
Independent Variables			

Variables	Code	Definition	Measurement
Dependent Variable			
Audit Committee Gender Diversity	FMAC	Indicates whether the audit committee has a female member.	If there is a female member on the audit committee, a value of 1 is given; otherwise, a value of 0 is given.
Independent Audit Committee Member	IMAC	Indicates whether the audit committee has an independent member.	If there is an independent member in the audit committee, a value of 1 is given; otherwise, a value of 0 is given.
Education Level of Audit Board Members	PhEDAC	The level of education of the audit committee members.	If the audit committee has members with doctoral, master's, university, and high school degrees, a value of 1 is given separately for each education level; otherwise, a value of 0 is given.
	PEDAC		
	GEDAC		
	HEDAC		
Audit Committee Size	SAC	The number of members the audit committee consists of.	Number of audit committee members
Audit Committee Foreign Members	FoMAC	Indicates whether the audit committee has a foreign member.	If there is a foreign member in the audit committee, a value of 1 is given; otherwise, a value of 0 is given.
Professional Expertise of Audit Committee Members	FeEXAC	Indicates whether the audit committee has a member with financial, accounting, and legal expertise.	If there is a member with professional expertise on the audit committee, a value of 1 is given; otherwise, a value of 0 is given.
	AcEXAC		
	LaEXAC		

Table 2 shows the variables in Model 2, which represents the ratio of voluntary disclosure sections. The average age of the committees is calculated by first finding the age of the members by taking the difference between the date of birth of the members stated in the annual report and the year in which the annual report was published. Then, the average age of the committee is found by dividing the total age by the number of committees. Education level was divided into four subgroups: high school, university, master's, and doctorate, and was included in the analysis. The ratio of educational diversity was determined by dividing the graduation level of the members by the size of the committee. The same applies to the determination of the professional specialization ratio. The calculation of the remaining variables is presented in **Table 2**. Model 2 comprises four main regression equations.

$$\text{RGSi} = \alpha + \beta_1 \text{RFMAC} + \beta_2 \text{RPhEDAC} + \beta_3 \text{RPEDAC} + \beta_4 \text{RGEDAC} + \beta_5 \text{RHEDAC} + \beta_6 \text{RAAC} + \beta_7 \text{RFeEXAC} + \beta_8 \text{RAcEXAC} + \beta_9 \text{RLaEXAC} + \beta_{10} \text{RFoMAC} + \beta_{11} \text{RIMAC} + \beta_{12} \text{RMFAC} \quad (5)$$

$$\text{RFI} = \alpha + \beta_1 \text{RFMAC} + \beta_2 \text{RPhEDAC} + \beta_3 \text{RPEDAC} + \beta_4 \text{RGEDAC} + \beta_5 \text{RHEDAC} + \beta_6 \text{RAAC} + \beta_7 \text{RFeEXAC} + \beta_8 \text{RAcEXAC} + \beta_9 \text{RLaEXAC} + \beta_{10} \text{RFoMAC} + \beta_{11} \text{RIMAC} + \beta_{12} \text{RMFAC} \quad (6)$$

$$\text{RFLI} = \alpha + \beta_1 \text{RFMAC} + \beta_2 \text{RPhEDAC} + \beta_3 \text{RPEDAC} + \beta_4 \text{RGEDAC} + \beta_5 \text{RHEDAC} + \beta_6 \text{RAAC} + \beta_7 \text{RFeEXAC} + \beta_8 \text{RAcEXAC} + \beta_9 \text{RLaEXAC} + \beta_{10} \text{RFoMAC} + \beta_{11} \text{RIMAC} + \beta_{12} \text{RMFAC} \quad (7)$$

$$\text{RSBDI} = \alpha + \beta_1 \text{RFMAC} + \beta_2 \text{RPhEDAC} + \beta_3 \text{RPEDAC} + \beta_4 \text{RGEDAC} + \beta_5 \text{RHEDAC} + \beta_6 \text{RAAC} + \beta_7 \text{RFeEXAC} + \beta_8 \text{RAcEXAC} + \beta_9 \text{RLaEXAC} + \beta_{10} \text{RFoMAC} + \beta_{11} \text{RIMAC} + \beta_{12} \text{RMFAC} \quad (8)$$

Table 2
Identification of Variables in Model 2

Variables	Code	Definition	Measurement
Dependent Variable			
Ratio of General and Strategic Information	RGSI	Here, is the ratio of the relevant section to the maximum score of that section.	$\frac{\text{Relevant Segment (RGSI etc.)}}{\text{Max Value of Relevant Segment}}$
Ratio of Financial Information	RFI		
Ratio of Forward-Looking Information	RFLI		
Ratio of Social and Board of Directors Information	RSBDI		
Independent Variables			
Audit Committee Gender Diversity Ratio	RFMAC	The ratio of the number of female members in the audit committee to the total number of members in the audit committee.	$\frac{FM}{(AC \text{ size})}$
Ratio of Independent Members of the Audit Committee	RIMAC	The ratio of the number of independent members in the audit committee to the total number of independent members.	$\frac{IM}{AC \text{ Size}}$
Age ratio of the audit committee	RAAC	The ratio of the sum of the ages of the audit committee members to the size of the audit committee.	$\frac{\sum \text{Age}}{(AC \text{ Size})}$
Ratio of Education Level of Audit Board Members	RPhEDAC RPEDAC RGEDAC RHEDAC	The ratio of the number of audit committee members with doctoral, master’s, university, and high school degrees to the size of the audit committee.	$\frac{ED \text{ (PhD etc)}}{(AC \text{ Size})}$
The ratio of foreign members in the Audit Committee	RFoMAC	The ratio of the number of foreign members to the size of the audit committee.	$\frac{(FoM)}{(AC \text{ Size})}$
Professional Experience Ratio of Audit Committee Members	RFeEXAC RACEXAC RLaEXAC	The ratio of financial, accounting, and legal experts to the size of the audit committee.	$\frac{EX \text{ (financial exp.)}}{(BD \text{ Size})}$
Ratio of Frequency of Audit Committee Meetings	RMFAC	The ratio of the number of audit committee meetings per year (12 months).	$\frac{MF}{12}$

5. Empirical findings

5.1. Descriptive statistics and correlation results

The descriptive statistics results of the variables used in Model 1 are presented in Table 3. The dependent variables are shown in the first four rows. According to the descriptive statistics results, the highest level of disclosure among the dependent variables is social and board information (mean 6.12) and general and strategic information (mean 4.194). The mean FMAC of the audit committee is 0.18. The maximum size of the committee is 6 and the average is 2. Most committee members have university degrees (mean: 0.52) and master's degrees (mean: 0.34). The committee generally has members with financial professional expertise

(mean: 0.49). The committee has the lowest proportion of foreign members (mean: 0.09) but the highest proportion of independent members (mean: 0.84).

Table 4 presents the descriptive statistics results of the variables used in Model 2. The first four rows of the table show dependent variables. The disclosure rate of financial information (average 42) and social and management information (average 38) is higher than the other dependent variables. The average ratio of female members on the board is 9.5. The ratio of educational level of the members shows that the highest number of members are university graduates. Since the average age of the committee members is approximately 26, we can conclude that the companies in the sample have a young committee structure. The average frequency of committee meetings is 0.23.

Table 3

Descriptive Statistics Results of the Variables Used in Model 1

Variable	Obs	Mean	Std. Dev.	Min	Max
GSIL	913	4194	3	0	14
FIL	913	3763	1921	0	7
FLIL	913	.91	1146	0	4
SBDIL	913	45997	2696	0	13
FMAC	913	.176	.381	0	1
SAC	913	2053	.337	1	6
EDAC	913	.368	.483	0	1
PhEDAC	913	.187	.39	0	1
PEDAC	913	.348	.477	0	1
GEDAC	913	.521	.5	0	1
HEDAC	913	.01	.099	0	1
FeEXAC	913	.429	.495	0	1
AcEXAC	913	.273	.446	0	1
LaEXAC	913	.111	.314	0	1
FoMAC	913	.097	.297	0	1
IMAC	913	.846	.362	0	1

Table 6 presents the correlation results of the variables in Model 1. The first four rows and columns show the correlation results of the dependent variables. According to the correlation results, there is no significant relationship between GSIL and FMAC, LaEXAC, and FoMAC. There is no significant relationships between FIL and FMAC, SAC, PhEDAC, PEDAC, GEDAC, FeEXAC, AcEXAC, LaEXAC, FoMAC, and IMAC. There is no significant relationships between FLIL and FMAC, SAC, EDAC, PhEDAC, LaEXAC, and FoMAC. There was no significant relationship between SBDIL and HEDAC. The table also includes the correlation results between the dependent variables. However, Model 1 consists of separate regression equations for the dependent variables; thus, the correlation results between the dependent variables are ignored. In addition, the VIF values were examined to test whether there is a multicollinearity problem between the independent variables. Hair et al. (2014) accepted the critical value of the VIF as 10. In this context, since the VIF values of the variables are between 1.14 and 9.58, there is no multicollinearity problem between the independent variables.

Table 4*Descriptive Statistics Results of the Variables Used in Model 2*

Variable	Obs	Mean	Std. Dev.	Min	Max
RGSI	913	32261	23078	0	107.692
RFI	913	41816	21343	0	77.778
RFLI	913	10113	12738	0	44.444
RSBDI	913	38253	16.85	0	81.25
RFMAC	913	9511	21539	0	100
RPhEDAC	913	10652	23721	0	150
RPEDAC	913	20053	29736	0	100
RGEDAC	913	36802	39492	0	100
RHEDAC	913	.602	6384	0	100
RAAC	913	25613	29153	0	83
RFeEXAC	913	25904	33.07	0	100
RAcEXAC	913	15.27	26793	0	100
RLaEXAC	913	5303	15178	0	50
RFoMAC	913	4637	14268	0	50
RIMAC	913	83206	36587	0	150
RMFAC	913	.233	.191	0	.833

The correlation results of the variables in Model 2 are presented in [Table 7](#). The first row and column of the table show the dependent variables, and the correlation results between them are ignored since separate equations are set up. There is no significant relationship between RGSI and RFMAC, RLaEXAC, and RFoMAC. There is no significant relationship between RFI and RFMAC, RPhEDAC, RPEDAC, RGEDAC, RAAC, RFeEXAC, RAcEXAC, RLaEXAC, RFoMAC, RIMAC, and RMFAC. There is no significant relationship between RFLI and RFMAC, RPhEDAC, RLaEXAC, and RFoMAC. There is no significant relationship between RSBDI, RFMAC, and RHEDAC. In addition, the VIF values are examined to test whether there is a multicollinearity problem among the independent variables. Since the VIF values of the independent variables are between 1.33 and 9.77, there is no multicollinearity problem between the independent variables.

5.2. Determination of model for panel data analysis

There are three models that can be used in panel data analyses: pooled least squares model, fixed effects model, and random effects model. The F-test and Hausman Test are applied to test which model is appropriate for the analysis. At the model decision stage, the F-Test is first applied to select between the pooled least squares and fixed-effects models. Here, the main hypothesis is established as;

H_0 : The pooled least squares model is valid.

and the main hypothesis is rejected if the significance value (p) is less than 0.05.

In the second stage, the Hausman test is applied to the choice between the fixed-effects and random-effects models. Here, the null hypothesis is;

H_0 : The unit and time effects among variables are random.

If the significance value (p) exceeds 0.05 as a result of the analysis, the null hypothesis is rejected. [Table 5](#) presents the results of the tests applied to determine the panel data model.

According to the table results, in the first of the model decision tests, the F test, the Fixed Effects Model, was preferred because the significance value in both Model 1 and Model 2 was less than 0.05. In the Hausman test results, the fixed-effects model was preferred because the significance value of the equations other than RFI was less than 0.05. The significance value of the RFI equation is greater than 0.05; thus, the random effects model is preferred.

Table 5*Results of Decision Tests for the Panel Data Model*

Models	F Test			Hausman Test		
	F Value	Prop > F.	Decision	Ki-Kare Value	Prop > chi2	Decision
Model 1	GSIL	(80, 805):51.27	0.000	chi2(25):90.41	0.000	Fixed-effects model
	FIL	(80, 805):42.30	0.000	chi2(25):90.40	0.000	
	FLIL	(80, 805):43.46	0.000	chi2(25):50.84	0.000	
	SBDIL	(80, 805):30.52	0.000	chi2(25):87.40	0.0017	
Model 2	RGSI	(82, 806):62.65	0.000	chi2(24):93.27	0.000	Fixed-effects model
	RFLI	(82, 806):40.63	0.000	chi2(23):53.31	0.000	
	RSBDI	(82, 806):43.73	0.000	chi2(24):4091.85	0.000	
	RFI	(82, 806):47.14	0.000	chi2(24):29.94	0.1869	Random-effects Model

Table 6*Model 1 Correlation Analysis for Model 1*

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) GSIL	1.000														
(2) FIL	0.029	1.000													
(3) FLIL	0.464	0.016	1.000												
(4) SBDIL	0.662	0.089	0.272	1.000											
(5) FMAC	0.020	-0.016	0.026	-0.065	1.000										
(6) SAC	0.073	0.055	-0.036	0.076	0.039	1.000									
(7) PhEDAC	0.094	0.039	-0.041	0.181	-0.031	0.050	1.000								
(8) PEDAC	0.216	-0.061	0.069	0.331	-0.013	0.009	0.003	1.000							
(9) GEDAC	0.175	-0.060	0.174	0.401	-0.011	-0.039	-0.091	0.148	1.000						
(10) HEDAC	0.071	-0.144	0.182	0.012	0.012	-0.016	-0.048	-0.026	0.007	1.000					
(11) FeEXAC	0.289	0.030	0.138	0.407	0.046	0.022	0.145	0.453	0.308	-0.087	1.000				
(12) AcEXAC	0.202	-0.019	0.303	0.266	-0.019	0.021	0.084	-0.009	0.336	0.113	0.328	1.000			
(13) LaEXAC	-0.011	0.011	-0.027	0.098	-0.035	0.090	0.063	0.182	0.184	-0.035	0.012	0.058	1.000		
(14) FoMAC	0.019	-0.058	-0.048	0.110	0.080	0.113	-0.02	-0.023	0.101	-0.033	0.036	0.031	0.049	1.000	
(15) IMAC	0.106	0.039	0.120	0.247	0.031	-0.041	0.182	0.198	0.209	0.043	0.236	0.119	0.083	-0.166	1.000

Matrix of correlations

Table 7*Results of Model 2 Correlation Analysis*

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) RGSi	1.000															
(2) RFI	0.029	1.000														
(3) RFLI	0.464	0.016	1.000													
(4) RSBDI	0.662	0.089	0.272	1.000												
(5) RFMAC	0.023	-0.014	0.024	-0.063	1.000											
(6) RPhEDAC	0.077	0.054	-0.028	0.153	-0.047	1.000										
(7) RPEDAC	0.203	-0.030	0.093	0.287	0.006	-0.076	1.000									
(8) RGEDAC	0.106	-0.006	0.150	0.336	-0.014	-0.210	-0.172	1.000								
(9) RHEDAC	0.077	-0.136	0.172	0.012	-0.002	-0.042	-0.035	-0.034	1.000							
(10) RAAC	0.133	-0.051	0.136	0.384	-0.117	0.117	0.294	0.368	0.096	1.000						
(11) RFeEXAC	0.249	0.009	0.155	0.331	0.148	0.162	0.352	0.195	-0.074	0.268	1.000					
(12) RAcEXAC	0.219	0.028	0.297	0.260	-0.023	0.119	-0.070	0.354	0.090	0.187	0.379	1.000				
(13) RLAcEXAC	-0.019	0.009	-0.027	0.094	-0.012	0.040	0.122	0.151	-0.033	0.170	-0.016	0.043	1.000			
(14) RFoMAC	0.008	-0.057	-0.037	0.106	0.070	-0.090	-0.032	0.111	-0.031	-0.061	0.047	0.033	0.007	1.000		
(15) RIMAC	0.109	0.042	0.118	0.249	0.047	0.191	0.185	0.176	0.043	0.244	0.218	0.105	0.085	-0.159	1.000	
(16) RMFAC	0.252	-0.041	0.252	0.234	0.038	0.055	0.058	0.125	0.061	0.105	0.139	0.067	0.107	-0.114	0.248	1.000

Matrix of correlations

5.3. Fixed effects and random effects model

In panel data analysis, efficiency is ensured by homoskedasticity, the absence of autocorrelation among error terms, and the absence of correlation among units. Therefore, the modified Wald Test and Breusch-Pagan Lagrange Test (for the stochastic model) for homoskedasticity, Bhargava, Franzini and Narendranathan's Adjusted Durbin Watson Test and Baltagi-Wu test for autocorrelation, and the Pesaran CD Test for correlation between units. According to the results of the analyses, the assumptions recommended for the efficiency of our panel data are not met; therefore, the analysis continues with robust estimation methods. Hoechle (2007) suggests that Driscoll-Kraay Standard Errors Method, a robust estimation method, can be used when the three assumptions are not met at the same time. In addition, it is observed that only the RFI regression equation has heteroscedasticity and autocorrelation problems, but there is no inter-unit correlation problem. In this case, according to Rogers (1993), if there is both heteroskedasticity and autocorrelation in the panel data, Roger Clustered Standard Errors Method can be used. Therefore, Roger's Clustered Standard Errors Method is used in the analysis of the ratio of financial information disclosure (RFI).

6. Regression results

6.1. Regression results for model 1

Table 8 presents the results of the regression equations showing the disclosure levels of general and strategic information (GSIL), financial information (FIL), forward-looking information (FLIL), and social and board information (SBDIL) in the voluntary disclosure checklist in Model 1.

FMAC has a significant and positive relationship with GSIL and FIL at 5% significance level. The H1 hypothesis is thus accepted. There is a significant positive relationship between IMAC and FLIL, and H3 was accepted. There is a significant positive relationship between having PhD (PhEDAC), master's (PEDAC), university (GEDAC), and high school (HEDAC) graduates on the audit committee and GSIL and SBDIL. There is also a significant relationship between GEDAC, HEDAC, and FLIL. These results support H6. The size of the audit committee (SAC) has a significant negative effect on GSIL and SBDIL, and H8 is accepted. Although there is a significant relationship between FoMAC and FIL, the coefficient sign is negative, indicating that the presence of foreign members in the committee reduces the disclosure of financial information. The H9 hypothesis is accepted. There is a significant and positive relationship between FeEXAC and FIL, AcEXAC and FLIL, and LaEXAC and SBDIL. Therefore, H11 is accepted.

Table 8

Explanation Level Results of Voluntary Disclosure Segments in Model 1

	Drisc/Kraay							
	GSIL		FIL		FLIL		SBDIL	
	Coefficient	P> t	Coefficient	P> t	Coefficient	P> t	Coefficient	P> t
FMAC	0.287	0.028	0.270	0.012	-0.030	0.817	0.110	0.270
SAC	-0.321	0.026	0.104	0.236	-0.100	0.091	-0.256	0.012
PhEDAC	0.720	0.000	0.089	0.547	0.116	0.357	1798	0.000
PEDAC	0.984	0.000	0.168	0.231	0.197	0.055	1936	0.000
GEDAC	0.662	0.000	-0.055	0.608	0.283	0.047	1919	0.000
HEDAC	2437	0.033	-0.609	0.178	2705	0.000	4132	0.000
FeEXAC	-0.105	0.233	0.185	0.029	-0.010	0.889	0.006	0.948
AcEXAC	0.143	0.190	0.103	0.456	0.130	0.015	0.140	0.219
LaEXAC	0.173	0.129	-0.084	0.396	-0.024	0.690	0.302	0.001
FoMAC	-0.025	0.812	-0.473	0.008	0.001	0.968	-0.084	0.702
IMAC	0.039	0.790	0.015	0.933	0.285	0.001	-0.301	0.106
_cons	3472	0.000	2665	0.000	1300	0.000	4265	0.000
Within R ²	0.1372		0.0992		0.1319		0.5318	
F-Value	425.96		224.27		9383.18		1083.68	
Prob > F	0.0000		0.0000		0.0000		0.0000	
N	913		913		913		913	

6.2. Regression results of model 2

Table 9 presents the results of the regression equations of the voluntary disclosure checklist sections in Model 2 for the disclosure of general and strategic information (RGSi), financial information (RFI), forward-looking information (RSBI), and social and board information (RSBDI).

According to the regression results, there is a significant and positive relationship between RFMAC and RGSi, RSBDI, and the H2 hypothesis is accepted. There is a significant relationship between RIMAC, RGSi, and RFLI. Therefore, H4 is accepted. Although there is a significant relationship between the average age of audit committee members (RAAC) and RGSi and RSBDI, the direction of effect is negative. H5 is accepted. There is a significant positive relationship between RPhEDAC, RPEDAC, RGEDAC, RHEDAC, and RSBDI. There is also a positive relationship between RPEDAC, RGSi, and RFLI. HEDAC is effective for all voluntary

disclosure sections. However, the effect of HEDAC on RFI is negative, whereas its effect on RGSi, RFLI, and RSBI is positive. Hypothesis H7 is accepted. There is a negative significant relationship between the ratio of foreign members (RFoMAC) and RFI, and H10 is accepted. In the audit committee, while there is a negative significant relationship between RFeEXAC and RGSi, a positive significant relationship between RAcEXAC and RGSi, and H12 is accepted. There is a significant positive relationship between the frequency of audit committee meetings (RMFAC) and RGSi. Therefore, H13 is accepted.

Table 9

Explanation Ratio Results of Model 2 Voluntary Disclosure Segments

	Drisc/Kraay						Rogers Clustered Standard Errors	
	RGSi		RFLI		RSBDI		RFI	
	Coefficient	P> t	Coefficient	P> t	Coefficient	P> t	Coefficient	P> t
RFMAC	0.033	0.004	0.005	0.803	0.016	0.033	0.039	0.187
RPhEDAC	0.049	0.091	-0.003	0.816	0.097	0.000	0.039	0.339
RPEDAC	0.062	0.010	0.026	0.027	0.097	0.000	0.036	0.54
RGEDAC	0.034	0.153	0.019	0.219	0.105	0.000	0.031	0.378
RHEDAC	0.276	0.000	0.269	0.008	0.220	0.000	-0.041	0.41
RAAC	-0.043	0.008	-0.012	0.356	-0.044	0.000	-0.076	0.066
RFeEXAC	-0.062	0.000	-0.019	0.055	-0.008	0.463	0.037	0.05
RAcEXAC	0.040	0.007	0.039	0.005	0.010	0.415	0.025	0.342
RLaEXAC	-0.005	0.896	-0.030	0.088	0.017	0.185	0.004	0.896
RFoMAC	-0.015	0.410	0.009	0.268	0.003	0.854	-0.078	0.048
RIMAC	0.030	0.034	0.020	0.033	0.009	0.335	0.025	0.395
RMFAC	6.970	0.006	1.057	0.422	0.634	0.810	-0.319	0.92
_cons	26.036	0.000	7.817	0.000	24.632	0.000	39.997	0.000
Within R ²	0.1367		0.1064		0.5391		Within R ²	0.1071
F- Value	528.50		30.87		606.90		Wald chi2	224.27
Prop > F	0.0000		0.0000		0.0000		Prop> chi2	0.0000
N	913		913		913		N	913

7. Conclusion and discussion

This article analyses the effect of audit committee structure and members' demographic characteristics on voluntary disclosure sections. Based on this analysis, it can be observed that the presence of an audit committee in a company has an effect on voluntary disclosure. This result is similar to that of previous studies (Ho and Wong, 2001; Arcay and Va'zquez, 2005; Samaha et.al, 2015).

The difference between our study and previous studies is that we attempt to reveal that the presence of a variable and its ratio may have different effects. Previous studies have shown the link between the existence or ratio of variables and voluntary disclosure separately (Barros et al., 2013; Akhtaruddin and Haron, 2010; Saha and Kabra, 2022). However, according to the results of the analyses, there is a difference between the two. For example, while the presence of a female member on the committee affects GSIL and FIL, the proportion of female members also affects RSBDI. This result shows that if the number of female members of the committee increases, the committee will make more disclosures on social issues and will

have a positive effect on firm legitimacy. As the ratio of master's-degree graduate members increases, the rate of disclosure of forward-looking financial information also increases. Similar statements can be made for professional experience and independent member variables. Therefore, the results of this article extend voluntary disclosure studies in terms of observing the difference in the effect between the presence of a variable and its ratio.

Another important point in the conclusion of this article is thought to be on business behavior. Corporate governance is an issue that maintains its importance because of the economic and climate crises of our age. A firm seeks to maintain and consolidate its legitimacy and credibility with the society in which it operates. Therefore, managers see voluntary disclosure as a strategic tool to ensure firm legitimacy (Saha and Kabra, 2020). Therefore, our results also show that the committee structure can enable a firm to make more voluntary disclosures.

8. Study limitations and suggestions

Since the demographic characteristics of the board of directors and audit committee are taken from the CVs published in the annual reports, the most important limitation of the study is that some of the information is missing or outdated. Another limitation is that the lack of a definite voluntary disclosure checklist accepted in the literature may lead to different results when analyses are performed with different lists.

In future studies, the impact of macroeconomic conditions, such as inflationary periods, on voluntary disclosure should be investigated. In addition, the effect of disclosures made through social media, the reason for disclosure, and who or which demographic characteristics are effective can be investigated.



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Appendix

Appendix 1

Volunteer Disclosure Checklist (Barako 2007)

A. General and strategic information

1. Information relating to the general outlook of the economy
2. Company mission statement
3. A brief history of the company
4. Organizational structure/chart
5. Description of the major goods and services produced
6. Marketing networks for finished goods and services
7. Company contributions to the national economy
8. Current business strategy
9. The likely effect of a business strategy on current performance
10. Market share analysis
11. Disclosure related to industry competition
12. Discussion of major regional economic developments
13. Information about regional political stability

B. Financial data

14. Historical summary of financial data for the past four years or more
15. Review of current financial results and discussion of major factors underlying performance
16. Statement concerning wealth created, e.g. value-added statement)
17. Supplementary inflation-adjusted financial statement financial ratios
18. Return on assets
19. Return on shareholders' funds
20. Liquidity ratios
21. Gearing ratios
22. Other Ratios

C. Forward-looking information

23. Factors affecting future performance
24. The likely effect of business strategy on future performance
25. New product and service development
26. Planned capital expenditure (PCE)
27. Planned research and development expenditure
28. Planned advertising and publicity expenditures
29. Earnings per share forecast
30. Sales revenue forecast
31. Profit forecast

D. Social and board disclosure

32. Number of employees in the past two or more years
33. Reasons for the change in the number of employees



34. Productivity per employee
35. Other productivity indicators
36. Indication of employee morale (e.g. turnover, strikes, and absenteeism)
37. Information about employee workplace safety
38. Data on workplace accidents
39. Statement of corporate social responsibility
40. Statement of environmental policy
41. Environmental projects and activities undertaken
42. Information on community involvement and participation
43. The names of the directors
44. Age of directors
45. Academic and professional qualification of directors
46. Directors' business experience
47. Directors' shareholding in the company and other related interests (e.g. stock options)

