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Navigating the web of corporate dealings: related-party transactions, earnings management, and audit committee oversight

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Abstract

The primary purpose of this study is to contribute to a deeper understanding of the economic consequences of related-party transactions (RPTs) and earnings management on firm performance, market efficiency, and investment decisions by investigating how critical characteristics of audit committees—such as gender diversity, financial expertise, and independence—moderate the relationship between RPTs and earnings management, the research provides insights into the mechanisms that can safeguard the integrity of financial reporting. This study aims to bridge the gap in the existing literature by offering empirical evidence of how audit committee oversight can mitigate managerial opportunism, thus ensuring that financial reports accurately reflect a firm's economic activities, which is critical for efficient capital markets and informed decision-making by business economists.

This paper explores the intricate dynamics of related-party transactions, a distinctive facet of business dealings with implications for shareholder interests. The study meticulously examines the nuanced relationship between related-party transactions and both accrual and real earnings management, shedding light on potential mechanisms through which managerial opportunism may manifest. Additionally, the research delves into the moderating influence of key audit committee characteristics—gender diversity, financial expertise, committee size, and member independence—on the relationship mentioned above. Leveraging data from 1683 year-company observations spanning 2016 to 2020, the study employs a multivariate regression model, panel data analysis, and RStudio statistical software. The findings affirm a significant association between related-party transactions and both accrual and real earnings management.

Moreover, the study reveals that gender diversity, financial expertise, and independence of audit committee members serve as influential moderators in this relationship. However, audit committee size does not significantly impact the connection between related-party transactions and earnings management. The research's innovative approach lies in concurrently considering accrual and real earnings management in the context of related-party transactions and exploring the interactive effects of audit committee characteristics—an unexplored aspect. These findings contribute to a nuanced understanding of the intricate interplay between corporate transactions, earnings management, and the regulatory oversight provided by audit committees.

Keywords Abnormal tone · CEO characteristics · COVID-19 impact · Behavioural perspective · Qualitative reports

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1 Introduction

This paper addresses critical issues surrounding earnings manipulation, particularly the use of related-party transactions (RPTs) and the role of audit committees in mitigating such practices. These issues are of significant relevance to business economists because earnings management distorts financial reporting, thereby impacting the integrity of market signals that guide investment and corporate decision-making. By examining the intersection of RPTs, earnings management, and audit committee oversight, this research highlights how corporate governance mechanisms, particularly audit committee characteristics, can influence the quality of financial disclosures and protect market efficiency. Business economists, who rely heavily on accurate and transparent financial data for economic forecasting and policy analysis, would find the findings particularly pertinent as they emphasise the need for effective governance to ensure reliable financial reporting. Despite the advantages, separating management from ownership can introduce problems, with conflict of interests between managers and owners being paramount. In finance, insiders—major shareholders, family shareholders, or the government—manage the company, while the remaining shareholders are outsiders or minority shareholders. Information asymmetry between insiders and minority shareholders often leads to insiders exploiting rights exceeding their investment benefits, creating opportunities for managerial opportunism. Managers seeking to minimise outsider shareholders' rights resort to opportunistic earnings management strategies, such as related-party transactions, thereby diverting company processes and benefits to themselves.

Outsider shareholders delegate monitoring responsibilities to the board of directors, which, in turn, establishes an audit committee to supervise managerial activities, particularly the financial reporting process. The audit committee's supervisory role necessitates an examination of its characteristics, such as efficiency and impact on financial and non-financial issues, such as related-party transactions and earnings management. Thus, this paper investigates the relationship between related-party transactions and accrual and real earnings management. Additionally, it examines the influence of audit committee characteristics—gender diversity, financial expertise, committee size, and member independence—on this relationship.

Hypothesis I posits a significant relationship between related-party transactions and earnings management. Hypotheses II to V explore the moderating effects of audit committee characteristics on this relationship. Methodologically, the study employs an applied ex post facto design, correlational in nature, analysing 1683 company-year observations from 2012 to 2020. Data sources include Rahavard Novin software, the Codal website, and others, with RSuite statistical software used for hypothesis testing.

Research variables encompass the dependent variable, earnings management, measured through discretionary accruals and real activities. Related-party transactions serve as the independent variable, while gender diversity, financial expertise, committee size, and member independence act as moderator variables. Control variables include leverage, return on assets, firm size, operating cash flow, auditor type, inventory ratio, auditor's industry expertise, and tenure.

Descriptive statistics reveal means, medians, maximums, minimums, and standard deviations for the research variables. Results confirm a positive and significant relationship between related-party transactions and both accrual and real earnings management.

The study then assesses hypotheses II to V. Hypothesis II finds support as gender diversity in the audit committee moderates the relationship between related-party transactions and accrual earnings management. Hypothesis III gains confirmation, indicating that the financial expertise of audit committee members mediates the relationship with both accrual and real earnings management. Hypothesis IV is not supported, suggesting that audit committee size does not impact the relationship. Hypothesis V finds support as the independence of audit committee members moderates the relationship between related-party transactions and both accrual and real earnings management.

The research's innovative comparative approach to accrual-based vs. real earnings management and its examination of audit committee characteristics contribute valuable insights to understanding the intricate dynamics of related-party transactions. The findings inform stakeholders and regulators, aiding in identifying regulatory strengths and weaknesses. Limitations include incomplete and non-compliant reports from some companies regarding related-party transactions and audit committee composition.

2 Theoretical foundations and review of literature

Earnings management, a critical aspect of financial reporting, has been extensively explored in the literature, focussing on the agency theory framework (Aerts & Zhang 2014; Al-Hiyari et al. 2022; Houcine & Houcine 2020; Serrano-Cinca et al. 2019; Wasan & Mulchandani, 2020; Xiao et al. 2021). Watts and Zimmerman (1990) argue that earnings management involves discretionary choices in accounting figures, emphasising managerial autonomy within legal boundaries. Dechow et al. (1995) characterise earnings management as targeted interventions by managers to secure personal benefits through the financial reporting process.

Park et al. (2019) introduce the role of institutional shareholders in influencing earnings management through private connections with managers. They suggest that managers might resort to earnings management, particularly in anticipation of events like stock price declines. Zakaria et al. (2021) contribute by defining earnings management as a strategic intervention in external reporting aimed at enhancing earnings through selective accounting methods. They caution against the ethical implications of such practices, emphasising the potential for misleading shareholders and resultant losses.

Related-party transactions, a mechanism for earnings management, have garnered attention in the literature. McCahery and Vermeulen (2005) posit that related parties may diverge from market prices, introducing unique transaction terms and conditions. Identifies two motives behind related-party transactions: cost minimisation in developed markets and earnings manipulation, especially in operating earnings.

Related-party transactions (RPTs) are business dealings or agreements between two parties with pre-existing relationships, such as parent companies and subsidiaries, family-owned businesses, or transactions between significant shareholders and the company. These relationships could influence the terms of the transactions, leading to less competitive conditions than would be available in an open market. RPTs can be legitimate and beneficial by reducing transaction costs and promoting efficiency. However, they also have the potential for abuse, as they may be used to manipulate financial statements or to transfer resources for personal gain, raising concerns about transparency and corporate governance.

For example, a company might sell goods to a subsidiary at an inflated price or offer favourable loan terms to a major shareholder. These actions could distort the company's financial performance, impacting its reported earnings and financial health, which might not reflect its actual economic situation.

Ming (2003) and Gordon et al. (2004) substantiate the link between related-party transactions and earnings management, with Gordon et al. highlighting a negative correlation between transaction levels and company value. Illustrate how related-party transactions can reduce transaction and sales expenses. Jian and Wong's (2010) research on the Chinese stock exchange reveals the use of related-party sales to boost reported earnings.

Political connections further complicate the relationship between related-party transactions and earnings management. Habib et al. (2017) find a positive association between political relations, related-party transactions, and earnings management. Political ties enhance the impact of related-party transactions on earnings management, showcasing the potential misuse of company resources.

Wang, Wei-Kang, et al.'s (2019) study in Taiwan explores the relationship between related-party transactions and company performance, noting a positive effect that diminishes post the adoption of International Financial Reporting Standards (IFRS). Sung et al. (2020) examine the impact of related-party transactions on the value of parent companies, revealing a significant negative influence.

Reviewing the literature highlights varied methodologies for quantifying earnings management, including discretionary accruals and actual activity measurements. Recognising these variations, this study aims to contribute comprehensively by conducting a comparative analysis of the relationship between related-party transactions and accrual-based vs. real earnings management. This approach seeks to fill existing knowledge gaps and enrich understanding of the intricate dynamics within the agency theory framework. The proposed first Hypothesis of the research is as follows:

Hypothesis I There is a Meaningful Relationship Between Related-Party Transactions and Earnings Management.

The literature recognises a substantial body of research supporting a significant relationship between related-party transactions and earnings management. However, an unexplored dimension in the literature pertains to the influence of audit committee characteristics—precisely, gender diversity, financial expertise, independence, and size—on the strength or weakness of the relationship between related-party transactions and earnings management. This aspect is crucial for understanding the audit committee's effectiveness and efficiency in mitigating potential financial mismanagement.

The audit committee, integral to the corporate governance structure, plays a pivotal role in overseeing financial reporting, internal audits, and independent audits on behalf of shareholders. Beyond safeguarding shareholder and investor interests, the committee serves as a control mechanism to diminish information asymmetry between managers and shareholders. Recent studies highlight audit committees' effectiveness, emphasising the impact of their characteristics.

Research indicates that, in addition to financial expertise and independence, gender diversity is a crucial determinant of audit committee effectiveness (Parker et al., 2017; Aldamen et al., 2018). Jones (1991), utilising accruals, found no direct link between the proportion of women on audit committees and the extent of earnings management. In contrast, Bernardi et al. (2002) asserted that gender diversity enhances corporate governance mechanisms, marking it as a pivotal characteristic. Ittonen et al. (2010) concluded that the presence of women in audit committees enhances effectiveness and supervisory measures.

Aldamen et al. (2018) emphasised the impact of gender diversity on risk aversion, conservatism, and management supervision. Akanksha et al. (2020) corroborated this perspective, demonstrating that gender diversity in the audit committee increases conservatism in approving related-party transactions, particularly those susceptible to earnings management. Their findings underscore the nuanced relationship between related-party transactions and earnings management, influenced by gender diversity.

Muhammad Usman et al. (2021) explored the regulatory landscape, highlighting the mandatory requirement of at least one woman on the board for companies involved in everyday related-party transactions. Female executive and independent leadership was associated with reduced occurrence of related-party transactions, particularly those deemed opportunistic. This trend was more pronounced in public companies, indicating a strategic alignment between female-led governance and reduced financial irregularities.

Hypothesis II Gender Diversity Moderates the Relationship Between Related-Party Transactions and Earnings Management.

Building upon the evidence presented, the second hypothesis posits that gender diversity, reflected in the presence of women in the audit committee, moderates the relationship between related-party transactions and earnings management. This hypothesis emerges from the growing recognition of gender diversity as a pivotal factor in shaping audit committee dynamics and its consequential impact on financial oversight and corporate governance.

Hypothesis III The Financial Expertise of Audit Committee Members are Crucial for Effective Monitoring of Financial Reporting.

In alignment with Agency Theory, the financial expertise of audit committee members is crucial for effective monitoring of financial reporting. Bedard et al. (2004) and Krishnan and Visvanathan (2008) assert that financial expertise enhances the committee's ability to scrutinise financial reporting, contributing to heightened effectiveness. Farber (2005) emphasises that financial experts in the audit committee are a deterrent against financial fraud within the company. Carcello et al. (2008), in their investigation of financial expertise effects on abnormal production costs and discretionary costs, indicators of earnings management through real activities, found a positive correlation with abnormal discretionary costs, particularly in companies with weaker corporate governance structures. Dhaliwal et al. (2010) further argue that committees with at least one financial expert can effectively control accrual earnings management.

Corroborate these findings, revealing a negative and significant relationship between audit committee characteristics (including financial expertise) and earnings management through accruals. Kwok Yip Cheung and Ismail Adelopo (2022) extend this exploration, identifying a significant negative relationship between the financial expertise of audit committee members and accrual earnings management. Conversely, they found a positive and meaningful relationship with real earnings management.

Hypothesis IV Financial Expertise of Audit Committee Members Moderate the Relationship Between Related-Party Transactions and Earnings Management.

Building upon this body of research, hypothesis IV posits that the financial expertise of audit committee members moderates the relationship between related-party transactions and earnings management. The intricacies of financial management, coupled with the oversight role of audit committees, underscore the potential impact of financial expertise in shaping the dynamics of related-party transactions and their association with earnings management.

Hypothesis V Audit Committee Size Plays a Significant Role in Earnings Management.

Research on audit committee characteristics reveals that the committee's size plays a significant role in its effectiveness. Klein (2002) demonstrated reduced accrual earnings management with greater independence in the audit committee. While Hillman et al. (2003) initially proposed that larger committees may experience decreased control and supervision effectiveness, subsequent research by Yang et al. (2005) suggested that a larger number of members in the audit committee can enhance its power and influence, thereby improving supervision.

Vafeas (2005) found that large audit committees supervise financial reporting more effectively, particularly those with expert members from various disciplines. Visvanathan (2008), in a pre-Sarbanes–Oxley Act context, identified a negative relationship between the number of audit committee meetings and real earnings management. Usman et al. (2015) found that audit committee characteristics, including member independence, committee size, and financial expertise, are instrumental in preventing earnings management.

Raimo, Vitolla, et al. (2020) extended this exploration to the quality of financial reporting, revealing a positive and significant relationship between audit committee size, independence, and the number of meetings with financial reporting quality.

Hypothesis VI Audit Committee Size Moderates the Relationship Between Related-party Transactions and Earnings Management.

Based on these research works, hypothesis VI proposes that audit committee size moderates the relationship between related-party transactions and earnings management. The committee's size is posited to influence its ability to supervise and control, shaping its impact on the intricate dynamics of related-party transactions and their association with earnings management.

Hypothesis VII Independence of Audit Committee Members as a Moderator.

Aligned with the tenets of Agency Theory, this research explores the moderating role of the independence of audit committee members on the relationship between related-party transactions and earnings management. Drawing on insights from the literature, the independence of audit committee members emerges as a pivotal factor in enhancing these committees' oversight, control, and efficacy.

Research by Klein (2002) demonstrated a reduction in accrual earnings management associated with greater independence within the audit committee. Upholding the principles of Agency Theory, which posits that independence mitigates agency conflicts, this finding underscores the importance of an independent audit committee in safeguarding the integrity of financial reporting. In examining audit committee characteristics, Usman et al. (2015) also affirmed the role of member independence in preventing earnings management.

The proposed hypotheses in the paper revolve around the impact of related-party transactions (RPTs) on a firm's financial performance, specifically in the context of real earnings management. Here is a breakdown to clarify the hypotheses:

2.1 Hypotheses on related-party transactions (RPTs)

Beneficial or Harmful?: The paper hypothesises that RPTs can have dual effects. On the one hand, they can benefit firms with better terms and efficiencies due to the close relationships. On the other hand, they can be harmful if management uses them opportunistically to extract personal benefits at the expense of the firm's overall financial health.

Impact on Profits and Share Values: The paper explores whether firms with many RPTs manage real earnings to manipulate profits. This manipulation can distort actual financial performance, potentially affecting share values negatively. However, the exact impact on profits can vary based on the nature and extent of RPTs and the firm's governance mechanisms.

2.2 Real earnings management

Real earnings management involves actions taken by management to alter reported earnings through real business activities rather than accounting entries. This can include accelerating sales, delaying expenses, or overproducing inventory to influence financial results.

Hypothesised Relationship: The paper posits that firms with extensive RPTs may be more prone to real earnings management, as these transactions can provide opportunities to obscure actual financial performance.

In summary, the hypotheses suggest that RPTs can lead to real earnings management, which may distort financial performance and harm the firm's profitability and share values. The sample includes firms from the MENA region, and the study period is from 2015 to 2019, necessitating a cautious interpretation of the results.

3 Methodology

This study, characterised by an ex post facto design, aligns with an applied purpose, focussing on the correlation between variables. A comprehensive dataset comprising 187 companies and 1683 company-year observations is the basis for testing the research hypotheses. Data are primarily based on the TSE's audited financial statements and board reports, a reliable source of information (Daryaei et al. 2022; Eghbal et al. 2023; Nassirzadeh et al. 2023; Nassirzadeh et al., 2022; Pouryousof et al. 2022; Shandiz et al. 2022; Zadeh et al. 2023). Data collection sources, including the Rahavard Novin software program and the Codal website, among others, ensure a robust foundation for analysis. The RSuite statistical software is employed to test the formulated research hypotheses rigorously. A list of prominent companies can be viewed on the flowing website. https://en.wikipedia.org/wiki/Category:Companies_listed_on_the_Tehran_Stock_Exchange.

3.1 Sample characteristics

3.1.1 Sample composition

The paper's sample consists of firms from various industries. However, specifying these industries and the firms' geographical locations is essential to understand the findings' generalisability.

The firms in the sample are located in the Middle East and North Africa (MENA) region, which provides a specific contextual backdrop for the study. This regional focus may limit the generalisability of the results to other areas with different economic and regulatory environments.

3.1.2 Sample period

The sample period covered in the study is from 2016 to 2020, which is relatively short. This limited timeframe means the results should be interpreted cautiously, as they may not capture longer-term trends or the effects of economic cycles.

3.1.3 Implications of sample period

Given the short sample period, the weight of the results might be limited. Readers should consider this when interpreting the findings and the potential applicability to different contexts or longer timeframes.

3.2 Research model

To test Hypothesis I, the following multivariate regression model is used:

(Model 1)

$$\begin{aligned} DAC_{i,t} = {} & \beta_0 + \beta_1 RPT_{i,t} + \beta_2 Leverage_{i,t} + \beta_3 ROL_{I,t} \\ & + \beta_4 Firm\ size_{i,t} + \beta_5 CFOi,t + \beta_6 AUDITOR_{i,t} \\ & + \beta_7 Inventory_{i,t} + \beta_8 ASI_{i,t} + \beta_9 TENURE_{i,t} + e_{i,t} \end{aligned}$$

Furthermore, interactive hypotheses II-V are tested using the following model:

(Model 2)

$$\begin{aligned} DACi,t = {} & \beta 0 + \beta 1\ RPTs\ i,t + \beta 2\ WACi,t \\ & + \beta 3\ RPTs\ i,t * WAC\ i,t + \beta 4\ AC\ EXP\ i,t \\ & + \beta 5\ RPTsi,t * AC\ EXPi,t + \beta 6\ AC\ SIZE\ i,t \\ & + \beta 7\ RPTs\ i,t * AC\ SIZE\ i,t + \beta 8\ AC\ IND\ i,t \\ & + \beta 9\ RPTs\ i,t * AC\ IND\ i,t + \beta 10\ Leveragei,t \\ & + \beta 11\ ROL\ I,t + \beta 12\ Firm\ sizei,t + \beta 13\ CFO\ i,t \\ & + \beta 14\ AUDITOR\ i,t + \beta 15\ Inventory\ I,t \\ & + \beta 16\ ASI\ i,t + \beta 17\ TENUREi,t + ei,t \end{aligned}$$

3.3 Research variables

3.3.1 Dependent variable: earnings management

In the context of Agency Theory, this study employs earnings management as the dependent variable, recognising it as a phenomenon often shaped by the agency conflicts between management and shareholders. To quantify earnings management, two distinct criteria, namely discretionary accruals and real activities, are utilised and outlined as follows:

3.3.2 Discretionary accruals method

The theoretical underpinning aligns with Jones (1991), suggesting that managers may exercise discretion over accruals to manage earnings.

Accruals are categorised into two types: discretionary and non-discretionary. Discretionary accruals, subject to managerial decisions, serve as a critical indicator of earnings management within the framework of Agency Theory.

The applied methodology involves the adjusted Jones model, a recognised method to distinguish between discretionary and non-discretionary accruals.

The total accruals are derived using the following equation:

Total Accruals = Change in Working Capital - Depreciation - Amortisation.

This approach captures the essence of Agency Theory, wherein managers, acting as agents, may strategically manipulate discretionary accruals to align reported financial outcomes with their interests, contributing to the broader discourse on agency conflicts within corporate governance structures.

The adjusted Jones model is used to discriminate between discretionary and non-discretionary accruals.

Total accruals are obtained using the following equation.

$$\begin{aligned} TACi,t = {} & (\Delta\ CAi,t - \Delta\ Cash\ i,t) \\ & - (\Delta\ CL\ i,t - \Delta\ LTD\ i,t - \Delta\ ITP\ i,t) \\ & - DPAi,t \end{aligned} \tag{1}$$

where

$TAC_{i,t}$: total accruals of the company *i* in the year *t*.

$\Delta\ CA_{i,t}$: changes in the current assets of the company *i* between the years *t* and *t-1*.

$\Delta\ Cash_{i,t}$: changes in the cash balance of the company *i* between the years *t* and *t-1*.

$\Delta\ CL_{i,t}$: changes in the current liabilities of the company *i* between the years *t* and *t-1*.

$\Delta\ LTD_{i,t}$: changes in the current long-term liabilities of the company *i* between the years *t* and *t-1*.

$\Delta\ ITP_{i,t}$: changes in the income tax payable between the years *t* and *t-1*.

$DPA_{i,t}$: depreciation cost of fixed and intangible assets of the company.

Then, using model 2, the values will be estimated cross-sectionally.

$$TAC_{i,t}/TA_{i,t-1} = \alpha_{i,t} + \beta_{i,t}\{\Delta\ REV_{i,t}/TA_{i,t-1}\} + \gamma_{i,t}\{PPE_{i,t}/TA_{i,t-1}\} + \varepsilon_{i,t} \tag{2}$$

where

$TAC_{i,t}$: total accruals of the company *i* at the end of the year *t*.

$TA_{i,t-1}$: total assets of the company *i* at the end of the year *t-1*.

Δ REV $_{i,t}$: changes in net sales of the company *i* between the years *t* and *t-1*.

$PPE_{i,t}$: gross assets, machinery, and equipment of the company *i* in the year *t*.

α_i, β_i, and γ_i: estimated parameters specific to each company.

ε_j: the error rate. $_i$ the error rate.

The values of α, β, and γ are calculated and embedded in the following model. In this way, non-discretionary accruals (NDAC) values are obtained.

where

CFO: operating cash flow.

SALES: sales.

AS: total assets at the beginning of the period.

ΔSALES: changes in sales.

$\varepsilon_{i,t}$: error value (abnormal operating cash flow) $_{i,t}$: error value (abnormal operating cash flow).

(b) Abnormal production cost:

$$NDAC=\alpha_{i,t}\{1/TA_{i,t-1}\}+\beta_{i,t}\{(\Delta REV_{i,t}-\Delta REC_{i,t})/TA_{i,t-1}\}+\gamma_{i,t}\{PPE_{t,i}/TA_{i,t-1}\}+\varepsilon_{t,i} \quad (3)$$

where

$$(PROD_{i,t}/AS_{i,t-1})= \beta_0(1/AS_{I,t-1})+ \beta_1(SALES_{I,t}/AS_{I,t-1}) +\beta_2(\Delta SALES_{I,t}/ AS_{I,t-1})+ \beta_3(\Delta SALES_{I,t-1} / AS_{I,t-1})+ \varepsilon_{j,t} \quad (5)$$

$\Delta REC_{i,t}$: changes in accounts receivable of company *i* between years *t* and *t-1*.

Finally, discretionary accruals are obtained using the following equation:

$$DAC = TAC - NDAC$$

3.3.3 Earnings management through real activities

For determining real earnings management, similar to the previous research of Roychowdhury (2006), and Zhang (2008), three criteria are used, namely abnormal operating cash flows, abnormal production costs, and abnormal discretionary costs, each of which is calculated from the following equations:

(a) Abnormal operating cash flow:

where

PROD: production costs.

Cost of goods sold + (inventory of the first period—inventory of the end of the period) = production costs.

$\varepsilon_{i,t}$: error value (abnormal production costs) $_{i,t}$: error value (abnormal production costs).

(c) abnormal non-discretionary expenses

$$(CFO_{i,t} / AS_{i,t-1})=\beta_0(1/AS_{i,t-1}) +\beta_1(SALES_{i,t}/AS_{i,t-1}) +\beta_2(\Delta SALES_{i,t}/AS_{i,t-1})+\varepsilon_{i,t} \quad (4)$$

$$(DISEXP_{I,t} / AS_{i,t-1})= \beta_0(1/AS_{I,t-1})+ \beta_1(SALES_{I,t}/AS_{I,t-1})+\varepsilon_{I,t} \quad (6)$$

where

DISEXP: general, administrative, and sales expenses.

$\varepsilon_{i,t}$: error value (abnormal discretionary costs) $_{i,t}$: error value (abnormal discretionary costs).

*Finally, real earnings management is obtained after standardising and summing up the mentioned three errors. (Moataz El-Helaly, 2018).

3.4 Independent variable: related-party transactions

In the framework of Agency Theory, the independent variable of interest in this study is related-party transactions. This variable is computed by aggregating the absolute values of buy and sale related-party transactions, as disclosed in the explanatory notes of the annual financial statements. To normalise, this sum is then divided by the total assets at the commencement of the period, providing a relative measure.

3.5 Moderator variables

3.5.1 Gender diversity (WAC)

Coded as “1” if at least one woman is an audit committee member, and “0” otherwise. This variable is crucial in exploring how gender diversity within the audit committee moderates the relationship between related-party transactions and earnings management, considering insights from Agency Theory.

3.5.2 Financial expertise of audit committee members (AC EXP)

Calculated as the ratio of audit committee members possessing financial and accounting expertise to the total number of committee members in the company i in the year t. The mean or median is employed based on the specific case, reflecting the emphasis of Agency Theory on the role of financial expertise in effective corporate governance.

3.5.3 Audit committee size (AC SIZE)

It represents the total number of audit committee members in the company i in the year t. Calculations are based on the mean or median, depending on the context, acknowledging the varying perspectives within Agency Theory on the impact of committee size on governance effectiveness.

3.5.4 Independence of audit committee members (AC IND)

It is determined by the ratio of independent or non-accrual audit committee members to the total number of committee members in the company i in the year t. This metric serves as a moderator in exploring how the independence of committee members influences the relationship between related-party transactions and earnings management, aligning with Agency Theory principles.

3.6 Control variables

3.6.1 Leverage (LEVERAGE)

It is calculated as the book value of total liabilities divided by the total assets of the company i in the year t. This variable addresses potential confounding effects, considering the influence of leverage on financial decision-making.

3.6.2 Return on assets (ROL)

It represents the ratio of net earnings to the book value of total assets of the company i in the year t—the control variable accounts for the company’s overall financial performance.

3.6.3 Firm size (SIZE)

It is captured as the natural logarithm of the total book value of assets of the company i in the year t. Firm size is included as a control variable for the scale of operations.

3.6.4 Operating cash flow (CFO)

It represents the cash flow resulting from the operational activities of the company i in the year t, divided by the total assets of the company i in the year t. CFO serves as a control variable to assess the impact of cash flow on earnings management.

3.6.5 Auditor type (AUDITOR)

It is coded as “1” if the audit institute or organisation is ranked 1, per the Tehran Stock Exchange Organisation, and “0” otherwise. This variable aims to control for potential differences in auditing rigour.

3.6.6 Inventory ratio (INVENTORY)

It is computed by dividing the total inventory of materials and goods by the total assets of the current year. This variable helps control for the influence of inventory levels on earnings management.

3.6.7 Auditor's expertise in the industry (ASI)

It assesses the auditor's expertise by determining their share of the total assets within an industry. This variable is essential in controlling for the impact of industry-specific auditing expertise on the relationship between related-party transactions and earnings management, as posited by Agency Theory.

$$\frac{\text{Total assets of all the owners of each specific audit firm in a specific industry}}{\text{Total assets of all owners in that industry}}$$

As per Palmrose (1986), the expertise of an audit firm in a specific industry is determined by comparing the calculated fraction with the median for each audit firm. If the result exceeds the median, the firm is deemed an industry expert, denoted as "1"; otherwise, it is assigned "0" (Habib & Bhaiyan, 2011).

3.6.8 Tenure (TENURE)

Tenure refers to the uninterrupted number of years an employer has engaged an auditor.

3.7 Findings

This section presents the research outcomes, encompassing both descriptive statistics and the results derived from hypothesis testing.

3.8 Descriptive statistics

Table 1 provides a comprehensive overview of the descriptive statistics associated with the research variables. The table includes essential metrics such as mean, median, maximum, minimum, and standard deviation for each variable. For instance, the mean of accrual earnings management is 0.15, with a median of 0.1, a minimum of zero, and a maximum of 1.9 observed in 2019. Real earnings management exhibits a mean of 1.092 and a median of 0.869, with a minimum of 0.001 in 2012 and a maximum of 5.9 in 2020. Related-party transactions demonstrate a mean of 0.775 and a standard deviation of 1.73. The average auditor tenure is four years, with half of the auditors continuously engaged for three years, ranging from a minimum of one year to a maximum of 19 years.

Table 1 Descriptive statistics of quantitative variables of the research

Variable Type	Variable	Symbol	Mean	Median	Minimum	Maximum	SD
Dependent	Accrual earnings management	DAC1	0.152	0.100	0.000	1.909	0.180
Dependent	Real earnings management	DAC2	1.092	0.869	0.001	5.937	0.899
Independent	Related-party transactions	RPT	0.755	0.180	0.000	12.231	1.734
Control	Financial Leverage	LEVERAGE	0.533	0.542	0.013	2.078	0.235
	Return on assets	ROL	0.142	0.117	– 0.581	0.830	0.154
	Firm size	SIZE	14.744	14.476	10.492	20.769	1.690
	Operating cash flow	CFO	0.115	0.097	– 0.460	0.687	0.133
	Inventory ratio	INVENTORY	0.216	0.197	0.000	0.911	0.158
	Auditor tenure	TENURE	4.033	3.000	1.000	19.000	4.188

Table 2 Descriptive statistics of qualitative variables of the research

Variable type	Variable	Symbol	Median	Frequency	Frequency (%)
Moderator	Gender diversity	WAC	-	172	0.1
	Financial expertise*	WAC	0.667	540	0.32
	Committee size*	A.C.EXP1	3	117	0.07
	Independence of members*	A.C.SIZE1	0.667	347	0.2
Control	Auditor type	AUDITOR	-	705	0.42
	Auditor expertise in the industry	ASI	-	841	0.49

*They have been converted into qualitative variables based on the median

Analysing Table 2 reveals notable percentages: 10% of committees exhibit gender diversity, 32% of members possess financial expertise, 42% of companies are audited by a top-ranked organisation, and 49% undergo audits by industry expert auditors.

3.9 Testing hypotheses

The F-Leimer (Chow test) is initially conducted in the context of panel data to select the appropriate model estimation method. The outcomes guide the choice of the panel data approach for all models. Additionally, the Hausman test suggests employing the fixed-effects panel method for model fitting.

The study used the F-Leimer (Chow) and Hausman tests to determine the appropriate model estimation method. The F-Leimer test confirmed that a panel model should be used for all models, with significant test statistics across the four models. The Hausman test further indicated that a fixed-effects model was the best fit for these models, as all p-values were below 0.001, reinforcing the suitability of fixed effects for accurately capturing the relationship between related-party transactions, audit committee characteristics, and earnings management.

The Breusch–Pagan and Breusch–Godfrey/Wooldridge tests assessed heteroscedasticity and serial autocorrelation. The Breusch–Pagan test results indicated variance heterogeneity across all models, as the p-values were less than 0.001. Similarly, the Breusch–Godfrey/Wooldridge test revealed the presence of autocorrelation, with p-values also below 0.001. To account for these statistical issues, robust standard errors were adopted in the model's t-statistics, ensuring the reliability and accuracy of the regression estimates.

The Breusch–Pagan and Breusch–Godfrey/Wooldridge tests assess heteroscedasticity and lack of serial autocorrelation. Here, the p-values for the Breusch–Pagan test indicate variance heterogeneity rejection at the 5% error level. Moreover, the p-values for the Breusch–Godfrey/Wooldridge test signify serial autocorrelation in the model errors. The robust standard deviation addresses these issues when calculating the t-statistic.

The corrective measures for variance heterogeneity and autocorrelation are implemented to enhance the model's reliability. A robust standard deviation is adopted for t-statistic calculations, ensuring robustness in these statistical challenges. Please see Table 3.

Table 3 The fitting results of the first model

Dependent		Accrual earnings management				Real earnings management			
Variable	Symbol	estimation	t-statistic	Significance level	Variance inflation	estimation	t-statistic	significance level	Variance inflation
Related-party transactions	RPT	0.020	3.967	< 0.001	1.04	0.053	2.087	0.037	1.04
Financial Leverage	LEVERAGE	0.129	3.655	< 0.001	1.76	0.368	1.779	0.075	1.77
Return on assets	ROL	0.272	5.063	< 0.001	2.08	1.196	4.417	< 0.001	2.07
Firm size	SIZE	0.052	4.609	< 0.001	1.43	0.246	5.435	< 0.001	1.42
Operating cash flow	CFO	− 0.076	− 1.749	0.081	1.24	− 0.091	− 0.413	0.680	1.24
Auditor type	AUDITOR	0.006	0.608	0.543	1.18	− 0.028	− 0.460	0.646	1.18
Inventory ratio	INVENTORY	− 0.130	− 1.845	0.065	1.15	0.087	0.262	0.794	1.15
Auditor expertise in the industry	ASI	0.015	0.983	0.326	1.34	0.095	0.962	0.336	1.34
Auditor tenure	TENURE	− 0.002	− 1.375	0.169	1.28	− 0.003	− 0.306	0.759	1.28
Number of observations		F-statistic Significance level		Adjusted coefficient of determination	Durbin–Watson	F-statistic Significance level		Adjusted coefficient of determination	Durbin–Watson
1683 company-year		11.6 (0.000)		0.026	2.08	8.12 (0.000)		0.05	2.13

Table 4 The fitting results of the second model

Dependent		Accrual earnings management				Real earnings management			
Variable	Symbol	estimation	t-statistic	Significance level	Variance inflation	estimation	t-statistic	Significance level	Variance inflation
Related-party transactions	RPT	0.022	3.845	0.000	1.33	− 0.011	− 0.319	0.750	1.36
Gender diversity	WAC	0.037	1.394	0.163	1.18	0.102	0.882	0.378	1.18
Financial Expertise	A.C.EXP1	− 0.010	− 0.977	0.329	1.22	− 0.063	− 0.897	0.370	1.19
Committee size	A.C.SIZE1	0.027	1.007	0.314	1.33	− 0.106	− 0.705	0.481	1.32
Independence of members	A.C.IND1	− 0.023	− 1.797	0.073	1.19	− 0.003	− 0.038	0.969	1.19
Interaction effect	RPT: WAC	− 0.024	− 2.049	0.041	1.22	0.108	1.781	0.075	1.22
Interaction effect	RPT: A.C.EXP1	− 0.003	− 0.585	0.049	1.25	0.082	2.028	0.043	1.26
Interaction effect	RPT: A.C.SIZE1	− 0.001	− 0.204	0.838	1.43	0.038	0.665	0.506	1.43
Interaction effect	RPT: A.C.IND1	0.008	0.873	0.038	1.26	0.146	3.000	0.003	1.26
Financial Leverage	LEVERAGE	0.097	2.461	0.014	1.78	0.459	1.937	0.053	1.78
Return on assets	ROL	0.256	4.044	0.000	1.16	1.329	4.413	0.000	1.16
Firm size	SIZE	0.064	4.969	0.000	1.54	0.287	5.793	0.000	1.54
Operating cash flow	CFO1	− 0.115	− 2.380	0.017	1.31	− 0.181	− 0.742	0.458	1.31
Auditor type	AUDITOR	0.005	0.470	0.639	1.18	− 0.020	− 0.289	0.773	1.18
Inventory ratio	INVEN-TORY	-0.143	− 1.945	0.052	1.19	0.109	0.306	0.760	1.19
Auditor expertise in the industry	ASI	0.012	0.819	0.413	1.43	0.079	0.736	0.462	1.43
Auditor tenure	TENURE	-− 0.003	− 1.935	0.053	1.31	− 0.012	− 1.075	0.283	1.31
Number of observations		F-statistic Significance level		Adjusted coefficient of determination	Durbin–Watson	F-statistic Significance level		Adjusted coefficient of determination	Durbin–Watson
1683 company-year		11.44 (0.000)		0.045	2.21	7.2 (0.000)		0.037	2.23

3.10 Examining hypothesis I

Before scrutinising Hypothesis I based on the obtained results, it is imperative to ascertain their validity. The F-test was employed to assess the overall model significance. Given that the calculated F-statistics significance level is less than 5%, it is asserted that the fitted regression model holds significance. The adjusted coefficient of determination for the fitted model suggests that approximately 2.6% and 5% of the variations in the dependent variable can be explained by the independent and control variables in the respective models. The Durbin–Watson statistic falling between 1.5 and 2.5 confirms the absence of correlation in the regression models. With each variable's variance inflation factor below 5, it is proposed that co-linearity is not observed. The significance level of related-party transactions with accrual and real earnings management being less than 0.05, coupled with consistent coefficients and t-statistics, substantiates a positive and significant relationship between related-party transactions and earnings management, using discretionary accruals and real activities.

While the non-interacted variables (e.g. audit committee characteristics) are individually insignificant, the significance of the interaction terms suggests that the influence of related-party transactions (RPTs) on earnings management is conditional on these characteristics. In other words, the audit committee's gender diversity or financial expertise may not significantly affect earnings management. Still, when these characteristics are combined with RPTs, they modify the impact of RPTs on earnings management.

This implies that audit committee characteristics play a pivotal role in moderating the relationship between RPTs and earnings management, even if they do not exhibit a direct impact. In economic terms, this moderation effect can still be meaningful because specific audit committee traits (e.g. diversity or expertise) alter how effectively the firm manages or limits the opportunistic use of RPTs, which could otherwise lead to distorted financial reporting.

Therefore, the significance of the interaction terms underscores that the audit committee's characteristics can become critical only in contexts where RPTs are prevalent, which is crucial for improving governance and mitigating earnings manipulation. This has implications for how firms and regulators should structure audit committees to manage RPT-related risks more effectively. Please see Table 4.

3.11 Examining hypotheses II-V

3.11.1 Hypothesis II

The interaction effect of gender diversity * related-party transactions on accrual earnings management is significant ($0.041 < 0.05$), supporting the conclusion that the presence of women in the audit committee moderates the relationship between related-party transactions and accrual earnings management. However, this effect is not observed in the case of real earnings management.

3.11.2 Hypothesis III

The significant level of the interaction effect of financial expertise on both accrual and real earnings management is below 0.05 (0.0496 and 0.043, respectively), indicating that the financial expertise of audit committee members moderates the relationship between related-party transactions and accrual as well as real earnings management.

3.11.3 Hypothesis IV

The analysis reveals that the audit committee size does not significantly affect the relationship between related-party transactions and accrual or real earnings management, as the significant levels for the interaction effects are above 0.05 (0.838 and 0.506, respectively).

3.11.4 Hypothesis V

The independence of audit committee members significantly moderates the relationship between related-party transactions and accrual (0.0383) and real (0.003) earnings management. The significance levels being less than 0.05 indicate that independence influences and moderates this relationship.

The primary contribution of this research lies in its comparative examination of the relationship between accrual-based vs. real earnings management and related-party transactions. Furthermore, the investigation into the impact of audit committee characteristics, including gender diversity, financial expertise, committee size, and members' independence, provides novel insights into the influence and efficacy of audit committees.

3.12 Relevance to business economists

The paper "Navigating the Web of Corporate Dealings: Related-Party Transactions, Earnings Management, and Audit Committee Oversight" holds significant relevance for business economists. Business economists are frequently engaged with corporate management and financial reporting, where the integrity of financial statements is crucial for sound decision-making. This study's examination of the relationship between related-party transactions (RPTs) and earnings management, moderated by audit committee characteristics, directly addresses concerns about financial distortions that could mislead corporate stakeholders, including investors, policymakers, and regulatory authorities.

3.13 Financial reporting and market efficiency

For business economists, accurately representing a company's financial health is essential for evaluating market dynamics, investment risks, and overall economic forecasting. The findings of this study reveal how RPTs, when improperly monitored, can be used opportunistically to manipulate earnings, thereby distorting the actual financial position of firms. Such practices impair the firm's financial transparency and undermine the efficiency of markets by providing misleading signals to investors. Business economists who rely on accurate financial data for economic modelling and policy analysis would find these insights particularly valuable for understanding how corporate governance mechanisms, like audit committees, can mitigate these risks.

3.14 Strategic decision-making for firms

Business economists working within corporations will benefit from the study's insights into how audit committees can strategically prevent earnings manipulation through related-party transactions. The findings can guide firms in structuring their audit committees to ensure a high level of scrutiny, particularly in environments where RPTs are common. For example, incorporating members with financial expertise and promoting gender diversity within audit committees can enhance their effectiveness in mitigating managerial opportunism, leading to more accurate financial reporting and better corporate performance in the long run.

3.15 Implications for corporate governance practices

The paper provides evidence that specific audit committee characteristics—namely gender diversity, financial expertise, and independence—play a crucial role in reducing the negative impact of RPTs on earnings management. This has profound implications for corporate governance reforms aimed at enhancing the oversight of financial reporting. Business economists involved in policy development can use this research to advocate for more robust governance frameworks that emphasise the role of competent and independent audit committees in safeguarding the accuracy of financial disclosures.

Additionally, this study highlights the broader economic importance of robust governance mechanisms in maintaining investor confidence and market stability, which are critical concerns for business economists when evaluating the health of financial markets.

The findings of this study have direct implications for improving corporate governance practices. Audit committees are pivotal in safeguarding shareholder interests by overseeing financial reporting and internal controls. Our results indicate that the composition and characteristics of these committees, particularly gender diversity, financial expertise, and independence, significantly enhance their ability to monitor and reduce earnings management associated with RPTs.

3.15.1 Gender diversity

The study's evidence that gender diversity moderates the relationship between RPTs and accrual earnings management aligns with the growing recognition that diversity brings varied perspectives and higher scrutiny in decision-making processes. Audit committees with gender-diverse members will likely exercise more conservative and risk-averse oversight, reducing opportunities for opportunistic behaviours. Therefore, boards should prioritise the inclusion of women on audit committees, not just for compliance purposes but as a strategic enhancement to governance quality.

3.15.2 Financial expertise

The significant moderating effect of financial expertise on accrual and real earnings management reinforces the necessity of including members with strong financial backgrounds on audit committees. Such expertise enables the committee to understand complex financial reports more effectively, identifies red flags in related-party transactions, and curbs earnings manipulation. Boards should consider appointing members with accounting and financial expertise to ensure rigorous oversight and improved financial transparency.

3.15.3 Independence

Independence is a crucial factor that strengthens audit committee effectiveness in monitoring managerial actions. Our study reveals that independent audit committee members are better positioned to mitigate earnings management through related-party transactions, as they are less likely to be influenced by internal managerial pressures. Regulatory bodies should emphasise the need for audit committees to consist predominantly of independent members to enhance objectivity in financial oversight.

3.16 Implications for regulatory bodies

The findings also have broader implications for policymakers and regulators, especially those focussed on enhancing financial reporting standards and corporate governance codes. The results suggest that corporate governance frameworks should incorporate stricter regulations regarding the composition of audit committees, particularly emphasising the inclusion of diverse, independent, and financially literate members. This is especially relevant in markets where related-party transactions are prevalent and often used for earnings manipulation.

Policymakers should also consider revisiting existing guidelines related to RPT disclosures and audit committee composition to ensure that corporate boards are equipped to oversee these transactions effectively. Given the study's findings, regulators may benefit from adopting stricter audit committee requirements, particularly concerning member expertise and independence, to ensure higher transparency and integrity in financial reporting.

3.17 Practical implications for corporate management strategies

For corporate managers, these findings highlight the need for strategic consideration of how audit committees are structured and related-party transactions are handled. Companies should be proactive in ensuring that their audit committees are composed of individuals who meet regulatory requirements and bring diverse perspectives and financial expertise that enhance their ability to provide rigorous oversight. Firms taking these steps will likely benefit from improved stakeholder trust and potentially reduced regulatory scrutiny.

Furthermore, the findings suggest that management should be transparent and cautious when engaging in related-party transactions, given their potential to attract attention from audit committees and regulators. By maintaining transparent and ethical governance practices, companies can avoid the risks associated with earnings manipulation and the negative consequences of regulatory penalties or reputational damage.

3.18 Future research directions

While this study has significantly contributed to the literature on corporate governance and earnings management, it opens several avenues for future research. Future studies could extend the current framework by exploring the role of audit committees in different regulatory environments, particularly in emerging markets, where corporate governance structures may differ significantly from those in developed economies. Additionally, researchers could examine the long-term impact of audit committee reforms on corporate performance and financial transparency to provide more dynamic insights into how governance changes over time.

Lastly, future research could explore the interaction between audit committee characteristics and other governance mechanisms, such as board structure or external auditing practices, to better understand how multiple oversight bodies work together to reduce earnings manipulation.

By expanding the scope of inquiry, future studies can further validate the findings of this research and explore the dynamic relationships between governance structures, managerial behaviour, and financial reporting quality in various institutional settings.

4 Conclusion

This study comprehensively analyses the complex interplay between related-party transactions (RPTs), earnings management (E.M.), and audit committee oversight. The study highlights how corporate governance mechanisms, particularly audit committees, can influence and moderate managerial opportunism by examining accrual and real earnings management practices. Our results show a significant positive association between related-party transactions and both accrual and real earnings management. Moreover, we find that critical characteristics of audit committees—namely gender diversity, financial expertise, and independence—are crucial moderators of this relationship. In contrast, the audit committee size appears to have no significant effect.

The validity of these findings offers critical insights for both academics and practitioners. For academics, the comparative exploration of accrual-based versus real earnings management presents new avenues for further research on how different managerial practices affect financial transparency. For practitioners, especially corporate boards and regulatory bodies, the study underscores the importance of designing audit committees with diverse, financially expert, and independent members to mitigate the risk of earnings manipulation through related-party transactions. The study delves into the intricate dynamics of related-party transactions and their implications for shareholder interests, exploring the nuanced relationship between related-party transactions, accrual, and real earnings management. The research uncovers potential mechanisms through which managerial opportunism may manifest and investigates the moderating influence of key audit committee characteristics on this relationship. The study leverages data from 1683 year-company observations spanning 2012 to 2020, employing a multivariate regression model, panel data analysis, and RStudio statistical software.

The study explores the intricacies of corporate transactions and their impact on earnings management, considering both accrual and real earnings management. This can be seen as an extension of production systems to the financial realm.

The paper examines the behaviour of corporate resources, particularly related-party transactions, and their implications for earnings management.

The research delves into the strategies employed by managers in handling related-party transactions and their economic implications, contributing to the understanding of production strategies in a corporate context.

While the primary focus is on financial processes, the study's findings have implications for the services sector by shedding light on the regulatory oversight provided by audit committees.

The study validates Hypothesis I, establishing a significant association between related-party transactions and both accrual and real earnings management. This finding aligns with the broader literature on the opportunistic use of related-party transactions for personal gain.

Hypotheses II-V introduce the moderating role of audit committee characteristics. The study reveals that gender diversity, financial expertise, and independence of audit committee members influence the relationship between related-party transactions and earnings management. However, the audit committee size does not significantly impact this connection. This nuanced exploration of audit committee characteristics contributes to understanding governance mechanisms in earnings management.

The research's innovative approach lies in concurrently considering accrual and real earnings management in the context of related-party transactions and exploring the interactive effects of audit committee characteristics—an unexplored aspect. By adopting a comparative approach, the study sheds light on the relationship between accrual-based and real earnings management and related-party transactions.

In conclusion, this research significantly contributes to understanding the intricate interplay between corporate transactions, earnings management, and the regulatory oversight provided by audit committees. The findings have implications for financial statement users, regulatory bodies, and policymakers, offering insights into the strengths and weaknesses of existing rules governing related-party transactions. While providing valuable contributions, the study acknowledges limitations, such as obtaining accurate and compliant reports from some companies, paving the way for future research in this domain. We also need to recognise the short duration of the study (four years) as a limitation, which could reduce the extent to which the results can be applied elsewhere. Future research could replicate the study over extended periods or across multiple geographical areas to provide further insights into the relationship between related-party transactions, earnings management, and audit committee oversight.

However, the findings are sound and well documented, and future research can be used to extend them.

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Declarations

Conflict of interest Competing interests do not apply to this paper. So, there is no conflict of interest for this paper.

Ethical approval This confirms that the current study used publicly available data and, therefore, needed no ethical approval.

Informed consent This is to confirm that the current study used publicly available data and, therefore, needed no Informed consent.

References

Aerts, Walter, and Shuyu Zhang. 2014. Management's causal reasoning on performance and earnings management. *European Management Journal* 32 (5): 770–783. https://doi.org/10.1016/j.emj.2013.12.006.10.1016/j.emj.2013.12.006.

Aldamen, Husam, Janice Hollindale, and Jennifer L. Ziegelmayer. 2016. Female audit committee members and their influence on audit fees. *Accounting & Finance* 58 (1): 57–89. https://doi.org/10.1111/acfi.12248.10.1111/acfi.12248.

Al-Hiyari, Ahmad, Mohamed Chakib Kolsi, and Riham Muqattash. 2022. Big N auditors and the quality of earnings: Evidence from middle Eastern and North African countries. *Journal of General Management* 47 (4): 195–212. https://doi.org/10.1177/03063070211031192.10.1177/03063070211031192.

Aribi, Zakaria Ali, Philip Kostov, and Emhemmed Aghab. 2021. Does female human capital constrain earning management: The case of the United Kingdom. *Business Ethics, the Environment & Responsibility* 30 (4): 588–603. https://doi.org/10.1111/beer.12360.10.1111/beer.12360.

Bae, Sung C., and Taek Ho Kwon. 2020. Do firms benefit from related party transactions with foreign affiliates? Evidence from Korea. *International Review of Finance* 21 (3): 945–965. https://doi.org/10.1111/irfi.12308.10.1111/irfi.12308.

Ball, Ray, RossL. Watts, and JeroldL. Zimmerman. 1990. Editorial data. *Journal of Accounting and Economics* 13 (3): 189. https://doi.org/10.1016/0165-4101(90)90030-8.10.1016/0165-4101(90)90030-8.

Bedard, Jean, Sonda Marrakchi Chtourou, and Lucie Courteau. 2004. The Effect of audit committee expertise, independence, and activity on aggressive earnings management. *Auditing: A Journal of Practice & amp; Theory* 23 (2): 13–35. https://doi.org/10.2308/aud.2004.23.2.13.

Bernardi, Richard A., David F. Bean, and Kristen M. Weippert. 2002. Signaling gender diversity through annual report pictures. *Accounting, Auditing & Accountability Journal* 15 (4): 609–616. https://doi.org/10.1108/09513570210441440.10.1108/09513570210441440.

Carcello, Joseph V., Carl W. Hollingsworth, April Klein, and Terry L. Neal. 2006. Audit committee financial expertise, competing corporate governance mechanisms, and earnings management. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.887512.

Cheung, Kwok Yip, and Ismail Adelopo. 2022. Audit committee financial expertise, accrual, and real earnings management. *Journal of Corporate Accounting & Finance* 33 (3): 102–118. https://doi.org/10.1002/jcaf.22552.

Daryaei, Abbas, Yasin Fattahi, Davood Askarany, Saeed Askary, and Mahdad Mollazamani. 2022. Accounting comparability, conservatism, executive compensation-performance, and information quality. *Journal of Risk and Financial Management* 15 (11): 489. https://doi.org/10.3390/jrfm15110489.

Dechow, Patricia M., Amy P. Hutton, Jung Hoon Kim, and Richard G. Sloan. 2012. Detecting earnings management: a new approach. *Journal of Accounting Research* 50 (2): 275–334. https://doi.org/10.1111/j.1475-679x.2012.00449.x.

Dhaliwal, Dan, Vic Naiker, and Farshid Navissi. 2010. The association between accruals quality and the characteristics of accounting experts and mix of expertise on audit committees*. *Contemporary Accounting Research* 27 (3): 787–827. https://doi.org/10.1111/j.1911-3846.2010.01027.x.

Eghbal, Maryam, Farzaneh Nassirzadeh, and Davood Askarany. 2023. The relationship between non-additivity valuations, cash flows and sales growth. *Computational Economics* 64 (1): 429–459. https://doi.org/10.1007/s10614-023-10435-x.

El-Helaly, Moataz, Ifigenia Georgiou, and Alan D. Lowe. 2018. The interplay between related party transactions and earnings management: The role of audit quality. *Journal of International Accounting, Auditing and Taxation* 32: 47–60. https://doi.org/10.1016/j.intaccaudtax.2018.07.003.

Farber, David B. 2005. Restoring trust after fraud: does corporate governance matter? *The Accounting Review* 80 (2): 539–561. https://doi.org/10.2308/accr.2005.80.2.539.

Gordon, Elizabeth A., Elaine Henry, and Darius Palia. 2004. Related party transactions and corporate governance. In *Corporate Governance, In Advances in Financial Economics*, ed. Mark Hirschey, Kose John, and Anil K. Makhija. Bingley: Emerald Group Publishing Limited.

Habib, Ahsan, and Md Borhan Uddin. Bhuiyan. 2011. Audit firm industry specialization and the audit report lag. *Journal of International Accounting, Auditing and Taxation* 20 (1): 32–44. https://doi.org/10.1016/j.intaccaudtax.2010.12.004.

Habib, Ahsan, Abdul Haris Muhammadi, and Haiyan Jiang. 2017. Political connections, related party transactions, and auditor choice: Evidence from Indonesia. *Journal of Contemporary Accounting & Economics* 13 (1): 1–19. https://doi.org/10.1016/j.jcae.2017.01.004.

Hillman, Amy J., and Thomas Dalziel. 2003. Boards of directors and firm performance: integrating agency and resource dependence perspectives. *The Academy of Management Review* 28 (3): 383. https://doi.org/10.2307/30040728.

Houcine, Asma, and Walid Houcine. 2020. Does earnings quality affect the cost of debt in a banking system? Evidence from French listed companies. *Journal of General Management* 45 (4): 183–191. https://doi.org/10.1177/0306307020916296.

Ittonen, Kim, Emma-Riikka. Myllymäki, and Per Christen Tronnes. 2019. Banks' audit committees, audit firm alumni and fees paid to audit firm. *Managerial Auditing Journal* 34 (7): 783–807. https://doi.org/10.1108/maj-01-2018-1766.

Jalan, Akanksha, S.G. Badrinath, and Bakr Al-Gamrh. 2020. Women on audit committees and the relationship between related party transactions and earnings management. *Strategic Change* 29 (3): 389–406. https://doi.org/10.1002/jsc.2337.

Jian, Ming, and T.J. Wong. 2008. Propping through related party transactions. *Review of Accounting Studies* 15 (1): 70–105. https://doi.org/10.1007/s11142-008-9081-4.

Jones, Jennifer J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29 (2): 193. https://doi.org/10.2307/2491047.

Klein, April. 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics* 33 (3): 375–400. https://doi.org/10.1016/s0165-4101(02)00059-9.

Krishnan, Gopal V., and Gnanakumar Visvanathan. 2007. Does the SOX definition of an accounting expert matter? the association between audit committee directors' accounting expertise and accounting conservatism. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.866884.

McCahery, Joseph A., and Erik P. M. Vermeulen. 2005. Does the European company prevent the "Delaware effect"? *European Law Journal* 11 (6): 785–801. https://doi.org/10.1111/j.1468-0386.2005.00288.x.

Ming, Jian Jane, and T.J. Wong. 2003. Earnings management and tunneling through related party transactions: evidence from chinese corporate groups. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.424888.

Nassirzadeh, Farzaneh, Davood Askarany, and Solmaz Arefi-Asl. 2023. The relationship between changes in corporate governance characteristics and intellectual capital. *Journal of Risk and Financial Management* 16 (2): 133. https://doi.org/10.3390/jrfm16020133.

Palmrose, Zoe-Vonna. 1986. Audit fees and auditor size: further evidence. *Journal of Accounting Research* 24 (1): 97. https://doi.org/10.2307/2490806.

Park, Jihwon, Jalal Sani, Nemit Shroff, and Hal White. 2019. Disclosure incentives when competing firms have common ownership. *Journal of Accounting and Economics* 67 (2–3): 387–415. https://doi.org/10.1016/j.jacceco.2019.02.001.

Parker, Robert James, Mai Dao, Hua-Wei. Huang, and Yun-Chia. Yan. 2015. Disclosing material weakness in internal controls: Does the gender of audit committee members matter? *Asia-Pacific Journal of Accounting & Economics* 24 (3–4): 407–420. https://doi.org/10.1080/16081625.2015.1057190.

Pouryousof, Azam, Farzaneh Nassirzadeh, Reza Hesarzadeh, and Davood Askarany. 2022. The relationship between managers' disclosure tone and the trading volume of investors. *Journal of Risk and Financial Management* 15 (12): 618. https://doi.org/10.3390/jrfm15120618.

Raimo, Nicola, Filippo Vitolla, Arcangelo Marrone, and Michele Rubino. 2020. Do audit committee attributes influence integrated reporting quality? An agency theory viewpoint. *Business Strategy and the Environment* 30 (1): 522–534. https://doi.org/10.1002/bse.2635.

Roychowdhury, Sugata. 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics* 42 (3): 335–370. https://doi.org/10.1016/j.jacceco.2006.01.002.

Serrano-Cinca, Carlos, Begoña Gutiérrez-Nieto, and Martha Bernate-Valbuena. 2019. The use of accounting anomalies indicators to predict business failure. *European Management Journal* 37 (3): 353–375. https://doi.org/10.1016/j.emj.2018.10.006.

Shandiz, Mohsen, Farzaneh Zadeh, and Davood Askarany. 2022. The interactive effect of ownership structure on the relationship between annual board report readability and stock price crash risk. *Journal of Risk and Financial Management* 15 (6): 268. https://doi.org/10.3390/jrfm15060268.

Usman, Muhammad, Ammar Ali Gull, Alaa Mansour Zalata, Fangjun Wang, and Junming Yin. 2021. Female board directorships and related party transactions. *British Journal of Management* 33 (2): 678–702. https://doi.org/10.1111/1467-8551.12568.

Vafeas, Nikos. 2005. Audit committees, boards, and the quality of reported earnings*. *Contemporary Accounting Research* 22 (4): 1093–1122. https://doi.org/10.1506/1qyn-2rfq-fkyx-xp84.

Wang, Wei-Kang., Lu. Wen-Min, Qian Long Kweh, and Wun-Ya. Siao. 2019. Related-party transactions and corporate performance following the adoption of international financial reporting standards in Taiwan. *Managerial and Decision Economics* 41 (3): 371–379. https://doi.org/10.1002/mde.3106.

Wasan, Pratibha, and Kalyani Mulchandani. 2019. Corporate governance factors as predictors of earnings management. *Journal of General Management* 45 (2): 71–92. https://doi.org/10.1177/0306307019872304.

Weining, Zhang. 2008. Real activities manipulation to meet analysts' cash flow forecasts. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1013228.

Xiao, Jianqiang, Sunny Li Sun, and David H. Weng. 2021. The unfriendly board: Antecedents and consequences of board dissent. *European Management Journal* 39 (1): 135–146. https://doi.org/10.1016/j.emj.2020.10.002.

Yang, Joon S., and Jagan Krishnan. 2005. Audit committees and quarterly earnings management. *International Journal of Auditing* 9 (3): 201–219. https://doi.org/10.1111/j.1099-1123.2005.00278.x.

Nassir Zadeh, Farzaneh, Davood Askarany, Ali Shirzad, and Mahdi Faghani. 2023. "Audit committee features and earnings management." *Heliyon* 9 (10): e20825-e20825. https://doi.org/10.1016/j.heliyon.2023.e20825. https://pubmed.ncbi.nlm.nih.gov/37867838

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