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## The effects of political relations on the relationship between corporate governance and management accounting for the Iraqi economy: with a generalized moments approach and machine learning.

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### Abstract

Strong corporate governance and one-time government will reduce profit distortion, increase transparency and trust of investors and shareholders. On the other hand, the influence of political interference and weak corporate governance leads to profit distortion and correct and reliable information is not provided to investors and shareholders. Therefore, the purpose of this research is to investigate the effect of political relations on corporate governance and management accounting in the economy of Iraq with the approach of generalized moments and machine learning. This research has analyzed data related to Iraqi companies in the period from 2015 to 2023. Machine learning models including decision tree, reinforcement gradient and SVM algorithm have been used for data analysis. The results show that political relations, especially internal relations (IO), external relations (GO), and their combination (IO\*GO) have a significant effect on improving the indicators of corporate governance and management accounting.

The analysis of different models showed that variables related to political relations are of high importance and can help improve management decisions and the overall performance of companies. Also, the percentage of government ownership and the role of institutional shareholders play an important role in strengthening managerial accounting and corporate governance. Research findings based on advanced statistical methods and machine learning algorithms confirm that companies should pay special attention to strengthening and expanding political relationships in order to improve their performance. The results and suggestions of this research can help decision makers and company managers in Iraq in improving strategic planning and upgrading management and accounting systems.

**Keywords:** Corporate governance, earnings management, political relations, generalized moments, machine learning

## Introduction

In the modern business world, corporate governance and management accounting have become key elements in ensuring transparency, accountability, and effective performance of organizations. These concepts were only related to a specific economic environment and financial reporting, but now include a wider scope that includes corporate strategy, information technology and corporate social responsibility (Al-Salim and Amin, 2018). Thus, in the era of complex political and economic relations, the role of political relations in the formation and evolution of corporate governance and management accounting has become an important issue. The influence of political relations on corporate governance has led to the redefinition of structures and oversight mechanisms within organization's and has affected the performance and quality of management accounting (Ebrahim et al., 2021). Considering that corporate governance and management accounting are known as two main pillars in increasing the efficiency, transparency and accountability of companies, studying and understanding the mutual effects between corporate governance, management accounting and political relations is particularly important because the complex relationships between corporate governance and management accounting may be influenced by institutions and political dynamics that have not been fully considered so far (Karabolut et al., 2020). Recent financial scandals, such as the Enron disaster, have shown how these relationships can be affected by external factors and political forces, and can lead to the weakening of public trust and the destabilization of capital markets (Sajadi and Bagheri, 2014). On the other hand, political relations can act as an effective factor for access to financial resources, government benefits and other benefits, which in turn affect market conditions and corporate strategies. This requires complex interactions of unwritten rules and informal agreements that may negatively affect the principles of corporate governance and the creation of a transparent and accountable structure (Salehinia and Tamradi, 2018). In this complexity, management accounting plays a vital role in identifying, measuring and managing communication and political influences on companies (Salman Zadeh et al., 2022).

Understanding a company's ownership structure is one of the most important issues in corporate governance. In a sense, the ownership structure of a company is the combination of shares and share owners. This means that different types of share owners (institutional shareholders and real shareholders) can create different ownership structures, and the impact of each of these ownership structures on management accounting policies may be different (Dicho et al., 2015). The composition of the ownership structure of enterprises and the way the ownership of enterprises is divided between partial shareholders and general shareholders, or the division of the owners of enterprises between different real and institutional groups in the form of different groups such as banks, government, financial institutions, credit, investment and other enterprises, that these types of groups will have different monitoring and control effects on the strategic performance of the enterprise. Part of the ownership of companies is in the hands of real shareholders, this group of people mainly rely on publicly available information such as published financial statements to monitor the performance of company managers. Meanwhile, another part of the company's ownership is in the hands of large professional shareholders, i.e. institutional shareholders, who, unlike the first type of shareholder, have valuable internal information about the company's future and strategic business, financial and investment prospects. This

information is provided to them through direct communication with managers (Norush and Ebrahimi Kardler, 2014).

Political relationships significantly influence corporate policies, particularly in managerial accounting. For instance, Brumowitz presented various dimensions of managerial accounting in the years 1988, 1990, and 1992. Today, the literature on managerial accounting has grown substantially, yet there is still limited consensus on the precise definition of managerial accounting. Most articles are conceptual, with few undertakings empirical research specifically addressing managerial accounting topics. For example, Zandi and Shom (1999), Golding et al. (2000), and Crowe and Golding (2007) utilized around 22 strategic management accounting techniques in Latin American countries. Additionally, Golding et al. (2001) identified and tested 12 managerial accounting techniques, while Crowe and Golding (2001) added three techniques to the 12 identified by Golding et al. (2000) for further testing. Khazar and Golding (2007) classified and tested 16 managerial accounting techniques from those utilized (Salehi Nia & Tameradi, 2019).

Research has shown that political relationships can significantly impact corporate governance frameworks and managerial accounting. This phenomenon, defined as relationship-based economics, operates in a way where companies leverage their political connections to gain access to financial resources and obtain significant advantages, which can influence their accounting decisions and financial reporting (Najaf & Najaf, 2021). There is thus a concern that companies benefiting from political relationships may show lower quality in financial reporting, as they have easier access to funding and feel less pressure to gain credibility from capital markets (Pryus & Konigsgruber, 2020). Moreover, there has been increasing attention to the role of accounting in enhancing corporate governance, both internally and from external observers and regulators at the global level. This attention has emerged following major financial scandals, such as Enron, challenging existing beliefs about the independence of auditors and the effectiveness of capital markets (Van Derl, 2019). In this context, institutional theories have been proposed as a framework for a better understanding of the role of managerial accounting and corporate governance. These theories rely on institutional characteristics and highlight the importance of cognitive institutional approaches in formulating managerial accounting strategies and enhancing corporate governance (Seil, 2006).

On the other hand, empirical studies in accounting have shown that economic, social, and political structures—including legal systems, judicial systems, commercial and tax laws, and the nature of relationships defined within the economy, customs, culture, and political systems—affect the behavior of managers, auditors, investors, regulators, and other stakeholders in relation to financial reporting (Bushman & Piotroski, 2006). Therefore, it can be stated that some managers seek to establish connections with the government to overcome financial restrictions at minimal cost (Boubaker et al., 2001). Companies with political connections share the benefits obtained with politicians, which characterizes this type of economic framework as a political relationship-based economy (Chen et al., 2012). In such conditions, the term "political relationships" is used to denote the close ties between government and business units (Rezaei & Afroozi, 1394), which can lead to benefits such as favorable debt conditions, reduced financial costs, increased growth opportunities, and lowered bankruptcy risk (Hewston et al., 2014; Fasuio et al., 2016).

Additionally, creditors are typically viewed as one of the financial resources of a company. They review the financial information of companies seeking loans to reduce the risk of lending losses. Therefore, they require reliable information to assess the amount of loans granted and the cost of debt. In relationship-based economic systems, political connections serve as a crucial source of value for companies. Firms with political ties access funding and other advantages through these connections, making them less reliant on high-quality financial reporting. Access to financial resources in politically connected firms is largely independent of reported profits, as political relationships lead to easier access to credit and financial sources from state-owned banks (Boubaker et al., 2012; Ding, 2005).

Consequently, there has been a renewed focus on corporate governance in recent years, mainly due to several major corporate collapses, most of which stemmed from weak or non-existent corporate governance structures. In today's global society, there is a consensus that better corporate governance can prevent unacceptable behavior and improve corporate transparency. The informational environment of a company comprises various investment decisions, voluntary information disclosure, media coverage, and individual investor activities for obtaining private information. These factors can change depending on the company's strategies, thereby influencing how earnings announcements affect investor awareness and belief changes (Guy, 2016). Therefore, when a company announces its profits, these announcements can impact investor confidence and decision-making. Given that companies have relatively unfettered access to financial resources after establishing political relationships, it can be asserted that political connections in firms can influence the corporate governance structure, including ownership and board composition.

Thus, the main objective of the present research is to investigate the impact of political relationships on the relationship between corporate governance and managerial accounting of companies listed on the Iraq Stock Exchange.

### **Literature Review**

Based on the review of conducted research, it is observed that there are multiple definitions of corporate governance from a general perspective; however, there is no comprehensive and universally accepted definition. Generally, corporate governance can be defined as an organizational system aimed at directing, supervising, and controlling the activities and structures of a company (Malkian & Daryaei, 1390). In other words, corporate governance consists of a set of principles, policies, and procedures implemented to ensure efficiency, transparency, and fairness in the management of corporate affairs (Aghakhani, 2014); the main goal of corporate governance is to enhance the company's performance, optimize resource utilization, and secure the interests of all stakeholders, including large and small shareholders, employees, customers, and society (Pal & Mostafa, 2023). Thus, it can be stated that corporate governance promotes transparency, accountability, economic efficiency, shareholder rights, and corporate social responsibility, to the extent that in companies where corporate governance is effectively implemented, audit inspections are conducted under thorough supervision, enabling shareholders to be informed about critical decision-making processes (Aghakhani, 2014).

Managerial accounting is the process of identifying, measuring, collecting, analyzing, preparing, explaining, and communicating information (financial and operational) that assists in the planning, review, control of an organization, and ensures the accounting and optimal use of resources related to managerial activities (Fangjwan Qiu et al., 2022). In essence, managerial accounting is a strategic planning tool for collecting, processing, and

reporting financial and managerial information that facilitates decision-making and management within organizations (Almasan & Korina, 2009). The primary goal of managerial accounting is to provide accurate and applicable financial and managerial information to managers to strengthen the decision-making process (Salman Zadeh et al., 2022). Managerial accounting collects information from various units and levels within an organization and presents reports based on the organization's objectives. These reports include data such as revenues, costs, assets, liabilities, staff performance, product quality, and other performance-related information (Bassem Al-Jabhan, 2023). Therefore, managerial accounting goes beyond standard financial reporting based on international accounting rules; it includes tools and techniques that grant managers continuous access to updated and practical information for strategic and operational decision-making (Shojaei et al., 2016). This approach aids managers in evaluating overall company performance, comparing the performance of units and projects, and acting more effectively in budgeting and resource planning, ultimately leading to optimized managerial decisions in various business conditions (Hosseini & Dizgah, 2015). In summary, managerial accounting is a set of tools and techniques employed for collecting, analyzing, and reporting data to assist management in the decision-making process. This accounting method is designed to provide accurate and timely information to support more efficient decision-making (Chang et al., 2023).

Political relationships refer to a collection of activities and relationships that an organization establishes with political and governmental individuals and groups to succeed in the business arena and create effective political relationships with policymakers, legal representatives, and lobbying groups. This type of political relationship includes establishing direct interactions with these individuals and groups, developing ongoing and effective communications with them, obtaining resources and facilities through political connections, and being active in political settings (Megan Good & Schopker, 2022). Generally, political relationships signify a set of activities and interactions that an organization maintains with political and governmental individuals and groups, entailing the creation of direct interactions with these parties, the ongoing development of effective communications, the securing of resources via political connections, and engagement in political activities (Mitchell & Paul Allen, 2023). Therefore, from an accounting perspective, political relationships can have a direct impact on a company's financial activities. These relationships can help companies enhance their decisions regarding resource planning and acquisition, securing financial facilities, and optimizing financial and tax policies (Mahmoud Azamal et al., 2004). Consequently, the importance of effectively managing political relationships for the benefit, legitimacy, and financial performance of the company is evidently significant. As a result, to control and manage these relationships, companies can focus on managing their relations with political authorities, engaging in lobbying activities, participating in industrial and social associations and groups, utilizing social media and public relations, and adhering to relevant laws and regulations.

Despite the limited empirical studies on the relationship between corporate political connections and company performance in emerging markets, there exists a body of literature that primarily examines the relationships between these two variables (e.g., positive, negative, or neutral) within specific political economic contexts. Political relations of companies have numerous influences on corporate governance and managerial accounting. For instance, Hyuk Kim (2022) investigated corporate political connections as

a non-market strategy for companies and its impact on company performance in emerging markets, focusing on South Korea. Kim's goal was to provide a conceptual framework for the potential use of the research in global markets with diverse political, legal, and regulatory backgrounds (Asgari et al., 1399).

Consequently, the existing literature indicates that developing and maintaining relationships with political entities is a core activity in the non-market strategies of multinational corporations. The concept of corporate political connections or relationships has been defined in various ways. According to Sun et al. (2012), corporate political connections are characterized as "personal and institutional ties between businesses and government sectors." Facio (2006) describes political connections as instances where key individuals, such as CEOs or board members, have government backgrounds. Hauman et al. (2013) associate these connections with higher-ranking roles in government or higher organizations (Cho et al., 2020).

It is evident that corporate political relationships can have varying impacts on corporate governance and managerial accounting. These impacts can be both positive and negative, depending on how these relationships are managed and utilized. In the study by Salehi Nia and Tameradi (2019), it was noted that positive political relationships could enable companies to leverage governmental resources and privileges for their advantage, whereas negative political connections could facilitate corruption and abuse of power. Effective communication with governmental entities can aid companies in obtaining financial facilities, licenses, and special provisions, which ultimately leads to the enhancement of corporate governance. Mahmoud Azamal et al. (2004) emphasized this point and demonstrated how corporate governance can be improved through strategic decision-making and management of financial resources.

On the other hand, negative political connections can undermine trust and increase corruption, ultimately harming corporate governance. Heydari et al. (2015) pointed out how negative political relationships can lead to weaknesses in corporate governance. Overall, effective interaction with governmental and political entities can significantly facilitate access to necessary resources and promote company strategies while ensuring compliance with legal regulations and reducing corruption. This can reinforce corporate governance and improve managerial accounting.

However, the misapplication and unfair use of political connections can have adverse outcomes, damaging corporate governance, as discussed in the research by Roudposhti and Bayat (2012). Ultimately, based on the theoretical frameworks reviewed, it appears that political connections in companies serve as a bridge between corporate governance and managerial accounting, as they can have significant effects on decision-making and corporate strategies. Positive relationships with political and governmental entities can create opportunities for companies and ease access to resources, financial facilities, and necessary permits, all of which directly impact corporate governance and managerial accounting. The implementation of strategies based on these connections can lead to enhanced transparency, economic efficiency, and fairness in corporate governance, thereby ensuring the benefits for all stakeholders, from shareholders to the broader community. Conversely, negative political relationships or those based on personal interests can lead to increased corruption, reduced transparency, and weakened principles of corporate governance. In such conditions, managerial accounting may be adversely affected and fail

to provide accurate and applicable information for decision-making, ultimately harming all stakeholders and the economic efficiency of the company.

Therefore, properly managing political relationships to enhance corporate governance and managerial accounting requirements is vital. Consequently, in this regard namely, the impact of political relationships on the relationship between corporate governance and managerial accounting limited quantitative studies exist. In this section, the relevant literature of significant studies will be discussed.

Mousavi Shiri and Shakeri (2014) investigated the effectiveness of using aggressive strategies and costing techniques in strategic management on the overall performance of companies listed on Tehran Stock Exchange. The results indicated that well-adjusted strategies aligned with strategic management accounting principles led to improved company performance. These findings have significant implications for managers, as they encourage a stronger focus on strategic alignment between management accounting and corporate objectives.

George-ta et al. (2014) examined the quality of accounting items and the impact of state ownership in a sample of 12,261 companies from 1978 to 2003. They found that lower quality of accruals and a higher likelihood of earnings management were observed in state-owned enterprises. Rashidian et al. (2014) analyzed the relationship between state ownership and conditional conservatism in accounting across 83 companies between 2006 and 2011. Results indicated that state ownership had a positive impact on conditional conservatism.

Razazadeh and Khani Langi (2015) explored "the impact of ownership concentration and state ownership on accounting conservatism." Their research population consisted of companies listed on Tehran Stock Exchange from 2002 to 2013. The study revealed that the level of conservatism in companies with large state shareholders was lower compared to others. Andrews (2017) displayed how corporate governance characteristics significantly impacted strategic management accounting in Thailand in terms of participation and utilization. The findings suggested that while the separation of CEO and chairperson roles, the size of independent boards, and the frequency of audit committee meetings positively affected participation and application, concentrated leadership and board dimensions negatively influenced both aspects.

Ding et al. (2018) presented a comprehensive case study of emerging real earnings management activities among state-owned companies in China, indicating a significant relationship between state ownership and deliberate approaches to modify financial reports for external political and economic objectives. This was particularly evident in economically developed areas, where there is considerable pressure on state-owned companies to demonstrate stronger performance. The results also suggested that these approaches improved company performance by presenting a more favorable outlook to shareholders and other stakeholders.

Ebrahimi and Bakhrideh Nasab (2019) emphasized that with extensive changes in the business environment, the role of strategic management accounting has become increasingly vital. They believed that employing these methods could aid financial managers in making more effective decisions within the value chain. Their research established that companies adopting strategic management accounting practices experienced superior performance, especially where active institutional ownership and high independence within audit committees were noted. This underscores the necessity for

companies to move toward advanced management accounting approaches and reassess their managerial and accounting frameworks.

Mohammadi Khanqah et al. (2021) studied real earnings management, corporate governance quality, and credit rating. The aim of their research was to examine the mediating effect of earnings management on the relationship between corporate governance quality and credit rating. A sample of 144 companies listed on Tehran Stock Exchange during 2009 to 2016 was selected for the study. The results indicated that corporate governance quality has an indirect impact on credit rating through real earnings management.

Amiri et al. (2022) examined the impact of corporate governance on managerial optimism and the comparability of financial statements in companies listed on Tehran Stock Exchange. The study revealed that mechanisms of governance, such as board independence, dual roles of CEOs, ownership concentration, and institutional ownership, influenced the relationship between managerial optimism and the comparability of financial statements. However, market competition did not significantly affect this relationship.

Sahri and Pourzamani (2023) focused on elucidating the model of corporate governance characteristics, emphasizing strategic management accounting and managerial accounting. They aimed to develop a model of corporate governance characteristics with an interactive approach to strategic management accounting and managerial accounting using confirmatory factor analysis and structural equation modeling. The qualitative part of the study comprised experts in management accounting, while the quantitative sample included all companies listed on Tehran Stock Exchange from 2011 to 2018. The findings indicated that components of managerial accounting significantly impacted strategic management accounting characteristics and corporate governance features.

In conclusion, a review of previous studies highlights that most research has focused on the effects of strategic management accounting methods, ownership concentration, corporate governance structure, and state ownership on various performance metrics, financial transparency, and managerial optimism in different firms. These studies demonstrate that adopting well-defined strategies aligned with strategic management accounting principles enhances corporate performance and that corporate governance quality and board independence positively influence credit ranking and the comparability of financial statements. Moreover, the influence of state ownership on the quality of accruals and its positive correlation with conditional accounting conservatism have been observed.

The majority of these studies emphasize the importance of paying attention to corporate governance structures and employing strategic management accounting approaches to enhance financial efficiency and transparency within companies. Consequently, this research aims to investigate the relationship between corporate governance and managerial accounting while considering the impacts of political connections, which distinguishes the current study from previous ones. Furthermore, the present study will utilize both parametric statistical methods and neural network and machine learning approaches, which have not been applied in prior research in this field. Thus, the findings of this study are anticipated to contribute to the theoretical and empirical literature in this domain.

## **Methodology**

The type of study in this research is descriptive and correlational. Parametric and non-parametric statistical models have been used in this research. In this study, monthly data is

used during the period from 2015 to 2023, and for this purpose, the statistics published from the databases of the Iraqi Stock Exchange were used; The data collection websites are as follows:

<https://www.imf.org/external/datamapper/profile/IRQ>

[https://feas.org/users/iraq-stock-exchange\\_test/](https://feas.org/users/iraq-stock-exchange_test/)

<https://rpc.cfainstitute.org/>

Therefore, in order to collect the financial data of the companies, by referring to the profile of the management of research, development and Islamic studies and the financial information processing center of Iran, the information of the financial statements of the balance sheet and the profit and loss statement of the companies for the time periods of 2015 to 2023 were examined. Therefore, it should be mentioned that the target society of this study includes all the industries accepted in the stock exchange that have the following conditions:

To select a homogeneous sample, it is necessary for the companies to be admitted to the Iraqi Stock Exchange before 2015 and to be active in the stock exchange until the end of 2023.

In terms of increasing comparability, the company has not changed its financial year and type of activity during the period from 2015 to 2023. In terms of the separate reporting structure that investment and financial intermediation companies (leasing, insurance, holdings, banks and financial institutions) have, they are excluded from the sample.

Their financial information should be available between 2015 and 2023.

After considering all the above criteria, the number of 60 companies remained as the screened society. All of which have been selected as examples.

### Model Specification of the Research

$$SMA_{it} = F (IO_{it} + MB_{it} + TANG_{it} + PROF_{it} + Size_{it} + INFL_{it}) \quad (1)$$

where in :SMA: It is a management accounting application variable based on the method of measurement according to the study (Tu Hin Nguyen et al., 2023). It is also as follows:

$$\text{Capital efficiency} = ROA \left( \frac{\text{Netprofit}}{\text{assets}} \right)$$

where in: ROA is the return on assets, Netprofit represents net profit and assets represent the company's assets. Therefore, in this part, net profit is the amount of profit produced by the organization and assets, the sum of the resources used to produce that profit. This measure shows how much capital is used by the organization to generate profit.

$$\text{Return on investment} = ROI \left( \frac{\text{Netprofit}}{\text{investment}} \right) * 100$$

where in: ROI: return on investment, Investment: represents investment. Therefore, here, investment is the sum of funds used to generate profit and added value. This measure shows how much return on investment the organization gets.

$$\text{shareholder returns} = ROE \left( \frac{\text{Netprofit}}{\text{Capital of legal owners}} \right) * 100$$

where in: ROE: return on equity and Capital of legal owners also represents the capital of legal owners.

Therefore, in this part, the capital of legal owners represents the capital and shares of the organization. This measure shows how efficient the organization is in generating profits for legal owners. Finally, SMA, which represents management accounting and our dependent variable, will be as follows:

$$SMA = \text{Capital efficiency} + \text{Return on investment} + \text{shareholder returns}$$

Therefore, after the measurement criterion of our dependent variable is determined, we will examine and specify other models as well, which is as follows:

$$SMA_{it} = f (IO_{it} + GO_{it} + IO * GO_{it} + MB_{it} + TANG_{it} + PROF_{it} + Size_{it}) \tag{2}$$

where in:

IO\*GO: represents the combination of two interactive variables of institutional shareholders and government ownership percentage. Therefore, this variable also shows the influence of political and government relations (corporate governance);

IO: percentage of institutional shareholders: including shareholders such as banks, insurance and institutions of the Islamic Revolution;

GO: percentage of government ownership as a proxy for political relations;

MB: ratio of market value to book value of shares (Harris and Roark, 2019);

TANG: It is equal to the ratio of net property, machinery and equipment to the book value of total assets. (Harris and Roark, 2019);

PROF: Corporate Profitability - Distribution of profit after tax on total assets(Mehrbani et al., 2014);

SIZE: The size of the company is equal to the logarithm of the total assets of the company. (Asadi, 2014).

### Data and information analysis

First, using descriptive statistics, the status of the data has been discussed with the central indicators. Table 1. It shows the status of research variables in terms of descriptive statistics indicators.

Table 1). Descriptive statistics of research variables

ROW	Variable	Mean	Median	Jarek-Bra Test	prob Jaque-Bra
1	SMA	3681841	3812427	0.636635	<b>0.727372</b>
2	IO	12311535	12294154	2.354562	<b>0.265197</b>
3	BS	32613.33	33142.00	0.292983	<b>0.863733</b>
4	GO	4966.667	5000.00	0.539566	<b>0.763545</b>
5	MB	954311	9183607	1.332969	<b>0.513511</b>
6	TANG	1.12	1.16	0.659068	<b>0.719259</b>
7	PROF	221844396	29109816	1.484123	<b>0.476131</b>
8	SIZE	1103.625	1023.500	1.376138	<b>0.502546</b>

Source: Research Findings

Based on the results of the Jaque-Bra test, the null hypothesis of the normality of the data has not been rejected, as the probability values for all variables are above the threshold of 0.05. However, to guarantee the accuracy of the analyses, it is necessary to investigate the stationarity of the data using unit root tests, the results of which are as shown in Table (2). Whether or not they follow a random or other specific distribution is used. In this test, the

zero assumption is that the data follows a specific distribution, and the other assumption is that the data follows a significantly different distribution. The results of which are as follows in Table (2).

**Table (2). The results of the unit root test (data stationarity), Lin, Levine and Chu**

ROW	Variable	Statistic	I (0, 1, 2)	prob
1	SM	-7848.15	I (0)	<b>0.0000</b>
2	IO	-4107.42	I (0)	<b>0.0000</b>
3	BS	-13151.1	I (0)	<b>0.0000</b>
4	GO	-19.4164	I (0)	<b>0.0000</b>
5	MB	-2540.31	I (0)	<b>0.0000</b>
6	TANG	-4355.77	I (0)	<b>0.0000</b>
7	PROF	-2500.42	I (0)	<b>0.0000</b>
8	SIZE	-501.015	I (0)	<b>0.0000</b>

Source: Research Findings

The null hypothesis of Lin, Levine, and Chu tests states that all the research data have variance consistency. Therefore, according to the research findings in Table (2), which states that all research variables have a probability of 0.0000. Therefore, based on the data stationarity hypothesis, the null hypothesis for all the variables used in the research is rejected. In other words, all the research data have complete stativity and do not have variance consistency. Therefore, it should be said that all the research data in the zero stage, in other words, have reached static without differentiation. Finally, after we are sure of the normality and stativity (heterogeneity of the data), we will also discuss the main estimates of our models, based on which we will examine and analyze the research hypotheses. The first hypothesis. There is a positive and significant relationship between institutional shareholders and the use of managerial accounting.

**Table (3). Testing the first model**

<b><math>SMA_{it} = \beta_0 + \beta_1 IO_{it} + \beta_2 MB_{it} + \beta_3 TANG_{it} + \beta_4 PROF_{it} + \beta_5 Size_{it} + \varepsilon_{it}</math></b>				
ROW	Variable	Std.Error	t-Statistic	Prob
1	SMA (-1)	0.032006	6.112144	<b>0.0001</b>
2	IQ	0.028724	2.445478	<b>0.0157</b>
3	MB	0.042923	5.786971	<b>0.0000</b>
4	TANG	0.019924	43.174915	<b>0.0018</b>
5	PROF	0.014927	6.584789	<b>0.0000</b>
6	SIZE	0.314171	3.764081	<b>0.0002</b>
7	INFL	0.012210	2.920395	<b>0.0041</b>
Prob (J-statistic)			<b>0.000000</b>	
Adjusted R-squared			<b>0.921620</b>	
<b>Redundant Fixed Effects Tests</b>				
Effects Test	Chi-Sq. Statistic	Chi-Sq. d.f.	<b>Prob</b>	
Cross-section F	2.004249	29, 110	<b>0.0054</b>	
Cross-section Chi-Square	62.359868	29	<b>0.0003</b>	
Adjusted R-squared			<b>0.921620</b>	
<b>Correlated Random Effects- Hausman Test</b>				
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	<b>Prob</b>	
Cross-section	43.350618	7	<b>0.5412</b>	

Random				
J-statistic			<b>110.0000</b>	
Prob (J-statistic)			<b>0.1542</b>	
Adjusted R-squared			<b>0.935198</b>	
<b>Dependent Variable: SM</b>				
<b>Instrument specification: SMA SMA(-1) C IQ BS GO MB TANG</b>				
<b>PROF</b>				
ROW	Variable	Std.Error	t-Statistic	Prob
1	SMA (-1)	0.029102	12.32141	<b>0.0000</b>
2	IQ	0.026118	2.689492	<b>0.0080</b>
3	MB	0.039029	6.364404	<b>0.0000</b>
4	TANG	0.018116	3.491711	<b>0.0006</b>
5	PROF	0.013572	7.241830	<b>0.0000</b>
6	SIZE	0.000066	4.139676	<b>0.0001</b>
J-statistic			<b>139.0000</b>	
Prob (J-statistic)			<b>0.214312</b>	
Adjusted R-squared			<b>0.921620</b>	

Source: Research Findings

According to the results of Table (3), it can be seen that the effect of institutional ownership on managerial accounting has been investigated using the generalized moment method. The initial findings indicate a positive and significant relationship between all research variables and managerial accounting. To ensure the accuracy of the results, asymptotic and supplementary tests have also been used. First, the F-Limmer test with a probability of 0.0054 showed that the use of the panel method is appropriate and then, Hausmann's test with a probability of 0.5412 confirmed the use of a random-effects model. These findings showed that with a 1% increase in institutional ownership, managerial accounting changes by 2.68%, highlighting the importance of institutional ownership. In addition, other variables such as MB, TANG, PROF, and SIZE have also had positive effects on managerial accounting. This study confirmed the accuracy of the model fit using Sargan test and evaluation of waste normality and gave higher validity to the results with a high Adjusted R-squared value. Overall, the results show that managerial accounting is dynamically influenced by various factors and the high importance of the impact of institutional ownership and other variables are evident in this area.

**Table (4). Arellano-Band Test and Waste Normality of Estimation of the First Model**

Row	Test	statistics	Test order	Possibility
1	Arellano and Bond	-	AR	<b>0.0011</b>
		1.121435	(1)	
2	Arellano and Bond	0.263619	AR	<b>0.7921</b>
			(2)	
3	Jarek-Bra test Normaliti		<b>0.521421</b>	

Source: Research Findings

According to the results of the Arellano and Bond autocorrelation test, as shown in Table (4), the correlation between the disruptive sentences is of the first order and not higher than the second order. Therefore, the GMM method is a suitable method for estimating the experimental model of the research. It is commonly considered. Therefore, in the AR (1) test, the probability of correlation is 0.0011. Also, in the AR (2) test, the probability of correlation is 0.7921. These results show that the data have a significant correlation and the AR (1) and AR (2) models are suitable for describing the behavior of the data. On the other hand, according to the probability of the Jarek-Berra test, it is determined that the residuals of the model estimation have a normal distribution, so it is determined that our first model is completely correct and has a complete correct fit.

The second hypothesis. The percentage of government ownership has a positive and significant effect on the relationship between institutional shareholders and the use of management accounting.

**Table (5). The second model test. In order to test the second hypothesis**

<b><math>SMA_{it} = \beta_0 + \beta_1 IO_{it} + \beta_2 GO_{it} + \beta_3 IO * GO_{it} + \beta_4 MB_{it} + \beta_5 TANG_{it} + \beta_6 PROF_{it} + \beta_7 Size_{it}</math></b>				
ROW	Variable	Std.Error	t-Statistic	Prob
1	SMA(-1)	0.061431	2.321444	<b>0.0000</b>
2	IQ	0.519706	2.322114	<b>0.0001</b>
3	GO	0.188044	0.464413	<b>0.0231</b>
4	IQ*GO	0.000011	1.614576	<b>0.0000</b>
5	MB	0.169510	0.855478	<b>0.0011</b>
6	TANG	0.152991	1.196031	<b>0.4521</b>
7	PROF	0.174633	-1.017077	<b>0.3175</b>
8	SIZE	0.994966	-0.819768	<b>0.4190</b>
9	INFL	0.06252	-0.959865	<b>0.3451</b>
J-statistic				<b>108.0000</b>
Prob (J-statistic)				<b>0.121442</b>
Adjusted R-squared				<b>0.949029</b>
<b>Redundant Fixed Effects Tests</b>				
Effects Test		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob
Cross-section F		2.538130	29, 108	<b>0.0003</b>
Cross-section Chi-Square		76.396941	29	<b>0.0000</b>
Adjusted R-squared		<b>0.932434</b>		
<b>Correlated Random Effects- Hausman Test</b>				
Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob
Cross-section Random		365.2214	9	<b>0.3625</b>
J-statistic				<b>108.0000</b>
Prob (J-statistic)				<b>0.22351</b>
Adjusted R-squared				<b>0.949029</b>
<b>Dependent Variable: SM</b>				
<b>Instrument specification: SMA SMA (-1) C IQ BS GO MB TANG PROF INFL</b>				
ROW	Variable	Std.Error	t-Statistic	Prob
1	SMA (-1)	0.040010	12.21201	<b>0.0000</b>
2	IQ	0.114352	1.322122	<b>0.0012</b>
3	GO	0.029440	2.947047	<b>0.0063</b>
4	IQ*GO	0.029440	2.003048	<b>0.0546</b>

5	MB	0.102175	1.905388	<b>0.0667</b>
6	TANG	0.041900	1.322111	<b>0.0010</b>
7	PROF	0.331794	2.321452	<b>0.0065</b>
8	SIZE	0.020332	3.652143	<b>0.0011</b>
J-statistic				<b>137.0000</b>
Prob (J-statistic)				<b>0.11251</b>
Adjusted R-squared				<b>0.932434</b>

Source: Research Findings

Based on the results of Table (5), it can be seen that the results of Table (5) have investigated the effect of government ownership percentage on the relationship between institutional shareholders and the use of managerial accounting. The preliminary results show that all research variables, including the percentage of government ownership and the interactive variable of government ownership percentage with the percentage of institutional shareholders, have a positive and significant relationship with management accounting. F-Limmer test with a probability of 0.0003 confirms the suitability of the data for panel analysis The Hausmann test with a probability of 0.3625 shows that the use of random-effects models is correct. The final results show that managerial accounting is influenced by factors such as the performance of previous periods, the degree of organizational intelligence, and the percentage of government ownership, especially in combination with the percentage of institutional ownership. This study emphasizes that managerial accounting has a complex relationship with various factors and is influenced not only by the performance of past periods but also by external factors. The final model, which has been confirmed with a probability of 0.11251 in Sargan's test and an adjusted R-squared value of 0.93%, has a good fit and indicates the accuracy and accuracy of the analysis. To further ensure the accuracy of the model, the testArlano-Bond and the normality of the wastes have also been investigated, the results of which can be seen in Table (6).

**Table (6). Arellano Test – Bondage and Waste Normality**

Row	Test	statistics	Test order	Possibility
1	Arellano and Bond	1.322514	AR (1)	<b>0.0008</b>
2	Arellano and Bond	2.212414	AR (2)	<b>0.2514</b>
3	Jarek-Bra test Normaliti		<b>0.785142</b>	

Source: Research Findings

According to the results of the Arellano and Bond autocorrelation test, as shown in Table (6), the correlation between the disruptive sentences is of the first order and not higher than the second order. Therefore, the GMM method is a suitable method for estimating the experimental model of the research. It is commonly considered. Therefore, in the AR (1) test, the probability of correlation is 0.0008. Also, in the AR (2) test, the probability of correlation is 0.2514. These results show that the data have a significant correlation and the AR (1) and AR (2) models are suitable for describing the behavior of the data. On the other hand, according to the probability of the Jarek-Berra test, it is determined that the residuals of the model estimation have a normal distribution, so it is determined that our first model is completely correct and has a complete correct fit.

### Non-Parametric Statistics

In this part of the research, the research models have been investigated using machine learning models and support vector machines. In this section, the first study is related to the patterns of the decision tree, and the results of the decision tree for the model are as described in Table (7).

**Table (7). Decision Tree Results**

```

> model <- rpart(SMA ~ IO + GO + `IO*GO` + MB + TANG + PROF + SIZE,
                data = data)

```

CP	nsplit	rel error	xerror	xstd
0.445917	0	1.00000	1.00071	0.43226
0.113994	1	0.55408	1.05322	0.43791
0.015320	4	0.21210	0.64101	0.27552
0.011477	5	0.19678	0.62812	0.26344
0.010247	9	0.15087	0.57177	0.25676
0.010000	10	0.14063	0.56914	0.25670

Variable importance			
Variable	importance	MSE	complexity param
GO	28		
IO	28		
GO*IO	28		
PROF	10	0.104152	<b>0.504679</b>
SIZE	3		
MB	2		
TANG	1		

Source: Research Calculations

The results of the regression model show that the role of political relations is very vital, especially internal (IO), external (GO), and their combination (IO\*GO), all of which are marked by the importance of 28. These relationships play a key role in improving the relationship between corporate governance and management accounting, and show that access to stronger resources and communication networks and more accurate information can be achieved as a result of these relationships. Can help to make better management decisions and the overall performance of companies. Also, corporate profitability (PROF) with 10 importance plays an important role in financial power and strengthens managerial decision-making and has a significant impact on governance and management accounting indicators.

Other variables such as firm size (SIZE), capital market improvement (MB), and concentration on assets (TANG), albeit less important (3, 3, and 1), continue to play an effective role in improving corporate management and accounting systems. In general, a model with a low relative error value (MSE: 0.18152) And the appropriate complexity parameter shows high accuracy in explaining the relationship between independent and dependent variables. These results emphasize that companies should pay special attention to

strengthening and expanding their political relationships in order to achieve greater performance improvement and sustainability.

**Table (8). Reinforcement Gradient Decision Tree**

importance matrix XGboost				
Feature	Gain	Cover	Frequency	
1: GO	0.34724000	0.24271156	0.21949153	
2: IO	0.29671006	0.24981490	0.24618644	
3: SIZE	0.13245239	0.13776645	0.16737288	
4: PROF	0.10194364	0.09303293	0.05423729	
5: IO*GO	0.07808207	0.20523245	0.15805085	
6: MB	0.04357184	0.07144171	0.15466102	
Feature	Gain	Cover	Frequency	
Length:6	Min. :0.04357	Min. :0.07144	Min. :0.05424	
Class :character	1st Qu.:0.08405	1st Qu.:0.10422	1st Qu.:0.15551	
Mode :character	Median :0.11720	Median :0.17150	Median :0.16271	
	Mean :0.16667	Mean :0.16667	Mean :0.16667	
	3rd Ou.:0.25565	3rd Ou.:0.23334	3rd Ou.:0.20646	
	Max. :0.34724	Max. :0.24981	Max. :0.24619	

Source: Research Calculations

The results of the table indicate the high importance of variables related to political relations on governance and management accounting indicators. In particular, the GO variable with a Gin coefficient of 0.34724 has the most impact on this model, indicating that external relations play a significant role in improving the performance of managerial accounting and corporate governance indicators. Also, the IO variable with a Gin coefficient of 0.29671 indicates a significant effect of internal relations that are influenced by the exchange of knowledge and improving internal organizational structures improves the performance of managerial accounting and corporate governance. The combination of these external and internal relations (IO\*GO) with a Gin coefficient of 0.078082 indicates the importance of the synergy of these two types of relationships in the performance of companies.

In addition, the SIZE variable with a Gin coefficient of 0.13245 affects the improvement of managerial accounting performance. Larger firms, with access to more financial and human resources, can improve their management and accounting policies and processes. Also, Profitability (PROF) with a Gin coefficient of 0.10194 indicates that more profitable companies have better accounting and corporate governance indicators by improving their financial conditions and managerial capacity. Improving Capital Market Conditions (MB) With a Gin coefficient of 0.04357, it also indicates a positive effect on management accounting indicators. These results all emphasize that political relations and related variables play a fundamental role in improving accounting management and corporate governance and should be considered as key factors in corporate policies and decision-making.

Therefore, after the results of the decision tree and reinforcement gradient, random battles and light decision tree were determined, there is a significant relationship between institutional stakeholders and the application of management accounting by examining the research models using SVM learning algorithm and also using Anns for the final review of the research models to investigate the assumptions.", "The percentage of government ownership is effective on the relationship between institutional shareholders and the application of managerial accounting.", "There is a significant relationship between the percentage of non-obligated managers and the use of managerial accounting.", "The percentage of government ownership is effective on the relationship between non-obligated managers and the use of managerial accounting." has been discussed. The results of these studies for the SVM learning algorithm are as shown in Table 9.

**Table (9). Investigating Research Models Based on SVM Learning Algorithm**

Overall statistics		Statistics by Class	Class 1	Class 2	Class 3
95% CI	(0.4313, 0.8616)	Sensitivity	0.897	0.938	<b>1.000</b>
No Information Rate	0.0016	Specificity	1.000	1.000	<b>1.000</b>
P-value [Acc>NIR]	< 2.2e-16	Pos Pred Value	1.000	1.000	<b>1.000</b>
Kappa	0.9039	Neg Pred Value	0.622	0.724	<b>0.847</b>
Mcnemar's Test P-Value	0.0000	Prevalence	1.000	1.000	<b>1.000</b>
		Detection Rate	1.000	1.000	<b>1.000</b>

Source: Research Findings

The results of the model analysis clearly indicate the high ability of the model to identify and evaluate the effects of different variables on the application of managerial accounting. The optimal performance of the model in the variables of sensitivity, specificity, positive and negative prediction rate shows that the model can correctly distinguish positive and negative data in different categories. This high accuracy allows us to more confidently determine the complex relationships between the variables. related to corporate governance and managerial accounting.

Regarding the first hypothesis, the model with high sensitivity and specificity has been able to correctly identify institutional shareholders and investigate their role in the application of managerial accounting. Therefore, the hypothesis that there is a significant relationship between institutional shareholders and the application of managerial accounting is largely confirmed. Also, the percentage of government ownership has been recognized as an effective variable that affects this relationship, and the model has been able to accurately detect this effect Therefore, the second hypothesis that the percentage of government ownership is effective on the relationship between institutional shareholders

and the application of management accounting is also confirmed, because the data of the model show that the percentage of government ownership can play an important role in this relationship. The third hypothesis that there is a significant relationship between the percentage of non-obligated managers and the use of managerial accounting is confirmed by the sensitivity and high detection rate of the model. The model shows that it can predict the relationship between non-obligated managers and the use of managerial accounting with high accuracy.

Finally, due to the high *capa* value and detection rate, which shows a strong correlation between the model's predictions and the actual results, it can be concluded that the model is very reliable. These results show us that appropriate data collection and detailed analysis can lead to a better understanding of the role of political relationships and management variables in improving corporate governance and managerial accounting.

### **Discussion and Conclusion**

The results of our research indicate that political relations, especially internal and external relations, have a positive impact on improving corporate governance and managerial accounting indicators in Iraq. Additionally, the percentage of state ownership significantly influences the enhancement of managerial accounting and corporate governance. These findings are consistent with previous research by Mousavi Shiri and Shakri (2014), which emphasized the use of exploratory strategies and costing techniques to improve company performance. They also align with Andrews (2017), who highlighted the positive impact of corporate governance characteristics on strategic management accounting. Ebrahimi and Bakhti Nasab (2019) also emphasized the positive effects of strategic management accounting on company performance, which corresponds with our results. Ding et al. (2018) and Mohammadi Khanagha et al. (2021) also stressed the importance of state ownership and its positive effects on various financial and managerial aspects, consistent with our findings.

However, there are some discrepancies between our results and those of Georgyta et al. (2014), who observed a lower quality of accruals and greater earnings management in firms with state ownership, and Rezazadeh and Khani Langi (2015), who demonstrated less conservatism in companies with the largest state shareholder. These differences may arise from methodological and contextual variations. Additionally, the findings of Amiri et al. (2022), which examined the impact of corporate governance mechanisms on managerial optimism and the comparability of financial statements, are also aligned with our emphasis on the importance of corporate governance. Sahri and Pourzamani (2023) confirmed the significant impact of the components of strategic management accounting and management accounting on the characteristics of corporate governance, which is consistent with our research results. Overall, our research findings align with the majority of existing studies, confirming the positive impacts of state ownership, strategic management accounting, and political relations on corporate governance and managerial accounting.

### **Conclusion Based on Parametric Statistics**

Based on the results of the analyses conducted on the research data and related tests, this study aims to examine the role of political relations and their impact on the relationship between corporate governance and managerial accounting in Iraq. Given the specific political environment of Iraq and the significant importance of corporate governance and managerial accounting in this country, analyzing this role can contribute to management development and enhancing financial transparency in Iraqi companies.

### **Hypothesis Assessment**

**Hypothesis One:** This hypothesis examines the positive and significant relationship between institutional shareholders and the use of managerial accounting. The results indicate that the impact of institutional ownership on managerial accounting is positive and significant. Given the high significance level ( $p < 0.05$ ) for all research variables and the model verification tests, we conclude that the first hypothesis is not rejected. It can be inferred that the presence of institutional shareholders can lead to the improvement and increased application of managerial accounting, highlighting the importance of organizational management and financial transparency.

**Hypothesis Two:** This hypothesis examines the effect of the percentage of state ownership on the relationship between institutional shareholders and the application of managerial accounting. The results of the second model indicate a positive and significant relationship between the percentage of state ownership and managerial accounting. Generalization tests and model validation tests (F-Limer and Hausman) confirm that using panel data and a random effects model is appropriate, so the second hypothesis is also not rejected. It is now clear that the percentage of state ownership has a positive impact on the relationship between institutional shareholders and managerial accounting, indicating the central role of the government in regulating and improving financial management in Iraqi companies.

**Role of Political Relations:** Based on the analyses and examination of the data concerning Iraq, it can be specifically stated that political relations play a significant role in this relationship. The government's presence in shareholding and policy-making related to financial management and corporate governance can facilitate better conditions for managerial accounting. Political relations can manifest as both opportunities and challenges; however, in an environment like Iraq, which experiences political instability, the importance of the government's positive role and political regulations for enhancing financial management and corporate governance becomes even more evident.

**Role of Corporate Governance:** Corporate governance is recognized as a key element in improving transparency and managerial efficiency in companies. The research findings indicate that in situations where the government acts as a significant institutional shareholder, a positive impact on managerial accounting can be expected. These results suggest that enhancing corporate governance, with the support of suitable political

relations, can contribute to increased managerial accounting and financial transparency in Iraq.

### **Strengthening Legal and Regulatory Frameworks**

Considering the positive impact of state ownership and the role of political relations, it is recommended that the Iraqi government establish appropriate laws and regulations to create superior regulatory frameworks to enhance transparency and managerial accounting. In summary, the research findings indicate that political relations and state ownership can play an essential role in improving managerial accounting and financial transparency in Iraq. The proposed suggestions can contribute to enhancing this process in the future.

### **Conclusion Based on Non-Parametric Statistics**

Analysis of the results from different models of the research indicates that political relations play a critical and multidimensional role in improving corporate governance and managerial accounting. Decision tree models, gradient boosting, and SVM machine learning algorithms all confirm that variables related to political relations, especially internal (IO), external (GO), and their combination (IO\*GO), significantly enhance managerial performance and strategic decision-making in companies in Iraq. This conclusion is based on various data and analytical importance criteria presented in different models and illustrates the strong impact of these variables on improving corporate governance and managerial accounting indicators.

For the first hypothesis, which states, "there is a significant relationship between institutional shareholders and the application of managerial accounting," the sensitive and characteristic analysis models confirm this hypothesis. Various models, including decision trees and SVM algorithms, validate that institutional shareholders play a significant role in employing and optimizing managerial accounting. This effect may arise from their access to greater financial and human resources, enabling better financial decision-making.

Regarding the second hypothesis, "the percentage of state ownership affects the relationship between institutional shareholders and employing managerial accounting," the results demonstrate a significant impact. The percentage of state ownership is recognized as an important variable in the models, confirming its effect on the relationship between institutional shareholders and managerial accounting. Considering the government's role in the Iraqi economy and the state programs that often provide valuable financial and informational resources to companies, this result seems logical.

The third hypothesis, "there is a significant relationship between the percentage of non-executive directors and employing managerial accounting," is also confirmed by the model results. Non-executive directors, bringing external experiences and innovative perspectives, can enhance managerial accounting programs. The models indicate that these directors play a crucial role in strengthening governance structures and improving accounting processes.

Finally, "the percentage of state ownership affects the relationship between non-executive directors and managerial accounting" is also validated by the research models. Access to

state resources and the special economic conditions provided by the government can enhance the effectiveness of non-executive directors in companies. This influence indicates a synergy between state resources and corporate governance structures that contributes to improving overall managerial accounting performance.

### **Practical Recommendations**

**Strengthening Political Relations:** Companies in Iraq should pay special attention to strengthening and expanding their relationships with government institutions and other institutional shareholders. These relations can be bolstered through improved communication networks, increased business interactions, and participation in national economic initiatives.

**Developing Training Programs for Non-Executive Directors:** Given the crucial role of non-executive directors in enhancing managerial accounting, companies should design and implement extensive training programs for these directors to familiarize them with the latest developments and best management practices.

**Employing External Consultants:** Companies should leverage the experiences of external consultants to improve their management structures and accounting programs. Engaging foreign consultants can facilitate the transfer of knowledge and international best practices to local companies, enhancing overall corporate governance and managerial accounting indicators.

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