

The moderating role of good corporate governance on the relationship between corporate social responsibility and real earnings management

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Abstract

Research Question: Does Good Corporate Governance have a moderating effect on the relationship between Corporate Social Responsibility and Real earnings management?

Motivation: Nowadays, the relationship between responsible governance and REM has gained momentum in the accounting and financial studies. In this context, the present work will provide more insight into the relationship between responsible governance factors (GCG, CSR) and REM in the presence of R&D and M&A.

Idea: this paper is to examine the moderating effect of good corporate governance (GCG) on the relationship between corporate social responsibility (CSR) and real earnings management (REM) level in innovative firms during mergers and acquisitions (M&A) transactions.

Data: Using the corporate governance ratio and CSR scores calculated by the Thomson Reuters Eikon ASSET4 database, this study was developed to investigate these issues on a sample of 113 U.S. S&P 500 index firms between 2015 and 2021. This study adopted a sampling process that divides the total sample into two sub-samples according to whether the companies are involved in M&A transactions (test sample) or not (control sample).

Tools: Multiple regressions on panel data is used to estimate our hypotheses.

Findings: The empirical results reveal that CSR score has a negative and statistically significant effect on REM in highly R&D-intensive firms involved in M&A. Furthermore, the findings suggest that that good corporate governance variable plays a moderating role in the relationships between CSR and REM of these firms but not for the non-merged ones.

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Contribution: This research contributes to the literature by providing the significant links between some CSR, good corporate governance and the REM level within R&D-intensive firms in the American M&A market.

Keywords: Corporate social responsibility (CSR), Good corporate governance (GCG), Real earnings management (REM), Mergers and Acquisitions (M&A).

JEL Classification: G34, M49.

1. Introduction

Global economic changes resulting from technological innovation and development have led to remarkable changes in corporate strategies. Indeed, firms have adopted new practices to disclose their financial information, such as business ethics, accountability, and transparency (Liu *et al.*, 2017; Ehsan *et al.*, 2018). These firms disclose not only financial information but also environmental and social information in the same report, i.e., integrated reporting (Grassmann, 2021). Hence, the emergence of CSR, which is perceived as an excellent tool to strengthen the company's legitimacy vis-a-vis stakeholders, especially after the global financial crisis of 2008 that created a climate of uncertainty and mistrust towards the market and stakeholders. To separate the company from this environment of mistrust, there has been an international trend to develop and implement corporate governance mechanisms to fight the opportunistic behavior of the executive (Gras-Gil *et al.*, 2016; Kuo *et al.*, 2021). In this regard, CSR emerged to combat various manipulations by executives and strengthen financial transparency.

Given the economic evolution that has generated a crisis of confidence in the quality of financial information, CSR practices have attracted the interest of several business leaders (Martinex-Ferrero *et al.*, 2016). Nowadays, no one doubts the critical place of CSR, which has become a pervasive theme at the heart of economic, social, and political debates. Consequently, companies have found themselves obliged to resort to monitoring and control mechanisms that strengthen the discipline of managers during the realization of innovation and Mergers and Acquisitions (M&A) investments (Muda *et al.*, 2017). This has led to re-emphasizing the role of CSR as an essential tool to avoid any manipulation by managers to protect the interests of stakeholders and ensure that commitments to the protection of the environment and sustainable development give credible results. Similarly, firms can ensure the credibility of the sound management of results by applying the good corporate governance (GCG) mechanisms. Indeed, GCG is represented by investor protection and concentration of ownership structure, which shows the crucial role of good governance practices and their considerable impact on the reputation of the firm and the implementation of governance methods that limit opportunistic behavior and improve the credibility of financial statements (Shleifer & Vishny, 1997; Gras-Gil

et al., 2016; Chao *et al.*, 2019). In addition, GCG mechanisms provide the control and oversight necessary to effectively control the management of the business and produce the desired results (Black *et al.*, 2015; Worokinasih *et al.*, 2020).

Within this analytical framework, this study aimed to test the impact of CSR and GCG on the real earnings management (REM) of Research and Development (R&D)-intensive firms involved in M&A transactions. Furthermore, we chose an internal growth strategy (R&D) and an external growth strategy (M&A) because these two growth strategies are considered crucial channels through which managers can increase the firm's value. They provide a range of accounting choices for company managers to manage their results. Indeed, there are two types of earnings management: accrual-based and cash flow-based (REM). This work focused on REM only as it has a direct impact on the cash flows of the company because it is applied by companies at the time of decision making in operating phases, financing decisions, and investment decisions. Therefore, REM involves operations that belong to the cash flows, such as discretionary expenses, operating cash flows, and production costs that constitute the three main components of the said management (Roychowdhury, 2006).

The objective of this work was to determine the effect of CSR on REM as well as the moderating effect of the GCG on the CSR-REM relationship in R&D-intensive firms involved in M&A in the U.S. The American economic context offers a stimulating framework for research because of the diversity of normative choices and accounting and regulatory methods and the flexibility given to managers in the choice of accounting practices. Moreover, the last decade has witnessed rapid growth in ethical and socially responsible investments in the United States (Dhaliwal *et al.*, 2012; Okafor *et al.*, 2021). Also, this choice is determined by the fact that most U.S. firms belong to the high-tech industrial sector involved in M&A practices, thus allowing for a sufficiently large and representative sample and potentially providing more generalizable and robust results.

In this regard, the statistical results obtained show that CSR has a negative impact on REM for a sample of 113 U.S. firms in the S&P 500 index between 2015 and 2021. The regression results imply that R&D-intensive firms engaged in CSR practices and GCG manage their earnings during M&A transactions. Likewise, the results show that the GCG plays a moderating role in the relationship between CSR and REM in R&D-intensive firms involved in M&A.

The findings of this study could be helpful for decision making by policymakers and investors to choose between the two growth strategies at the level of responsible governance practice, which has attracted the attention of several stakeholders, such as investors, financial analysts, researchers, who need quality information based on this social and ethical approach. Similarly, we tried to explore in-depth the reality and perspectives of REM in the presence of CSR in R&D-intensive firms. In

addition, this work helps lawmakers assess the reliability of U.S. firms involved in M&A transactions and thus gain insight into the role of CSR and GCG in affecting REM practices. Currently, information about M&A transactions has become public in the capital market and attracted the attention of media, financial analysts, and investors.

The remainder of this paper is organized as follows: Section 2 presents the literature review and research hypotheses. Section 3 describes the methodology used. The main empirical findings are outlined in Section 4. Finally, the conclusions and the implications as well as the limitations of the research are presented in section 5.

2. Literature review and hypotheses development

2.1 CSR and REM in high R&D intensity firms involved in M&A transactions

Earnings management severely affects the credibility of financial statements, in which accounting information is worthwhile for the business (Chih *et al.*, 2008; Prior *et al.*, 2008; Ben-David *et al.*, 2013; Liu *et al.*, 2017; Kuo *et al.*, 2021). Thus, to combat this type of accounting manipulation and induce accounting transparency (Prior *et al.*, 2008; Susanto & Pradipta, 2016; Martinex-Ferrero *et al.*, 2016; Almahrog *et al.*, 2018), a new concept related to responsible governance practices appeared in recent decades, suggesting the importance of these practices in implementing responsible investments to avoid any manipulation by the managers.

Thus, responsible governance presents a new cornerstone of CSR as it is fundamental to ensuring that commitments to sustainable development yield credible results. CSR has been deemed one of the main challenges in corporate governance. Hence, companies and their boards need to integrate CSR into their overall approach. This concept has gained momentum for several years worldwide (Martinex-Ferrero *et al.*, 2016). It emerged at the end of the 19th century in the United States, with the development of large companies and the social and even societal issues they generated. In this regard, ISO 26000, a standard of the International Organization for Standardization (ISO), established guidelines for CSR and, more generally, for organizations. This standard, published on November 1, 2010, shows that social responsibility is closely related to sustainable development. Since the latter covers common economic, governance, social, and environmental objectives, it is used to reflect the broader expectations of society. CSR is therefore often understood as the implementation of sustainable development concepts in the company, integrating environmental, social, governance, and economic pillars. As a result, integrated reporting involves reporting financial and non-financial information in a single document to improve annual reports by providing more detailed financial information on current and future prospects (De Villiers *et al.*, 2017). Accordingly,

companies should produce IR because it plays a central role in CSR commitments and because a true sustainability strategy requires a real commitment to transparent reporting.

Moreover, since CSR is an essential element of corporate reputation and competitiveness and helps ensure efficiency and drive innovation (Stigson, 2002; Asongu, 2017), some CEOs now see CSR as part of their strategic management agenda, while others see it as a source of innovation.

Companies have vigorously invested resources in CSR to improve their image, shift interaction with stakeholders, and enhance investor confidence. As a result, Renneboog *et al.* (2008) view CSR as the integration of appropriate corporate governance that protects the shareholder's interests, environmental efficiency that protects the interests of environmental stakeholders, and good social relationships that protect the interests of other stakeholders, including employees and the local community.

This work examines the impact of CSR on the REM of R&D-intensive companies involved in M&A transactions. As a result, CSR is considered a way to decrease manipulation during M&A investments. Furthermore, CSR is becoming increasingly important in the U.S., especially among companies having a significant level of M&A transactions. Indeed, CSR has become a method used by companies in various fields to meet social expectations, which reflects their concern for employees, customers, upstream and downstream manufacturers, communities, and the environment (Yen & André, 2019). Consequently, the company aims not only to maximize profits but also to be responsible vis-a-vis stakeholders. Chao *et al.* (2019) show that companies with good CSR performance can generate positive average abnormal returns during the reporting period and three years after the completion of M&A.

We can infer that investment in CSR activities can bring positive benefits to shareholders and encourage companies to formulate strategic methods and objectives in light of organizational goals and operational benefits and consider their personal interests while fulfilling their social responsibilities to achieve sustainable development of companies and society.

Studies by Chao *et al.* (2019) and Yen and André (2019) argue that market returns from M&A events are generated differently for CSR commitments in different institutional settings. When firms operate in economies with slow investor protection systems, outside investors are more likely to worry about agency costs and assume that dominant insiders, without proper oversight, will execute unprofitable CSR programs to enhance their social reputation instead of balancing conflicts between interest groups. Similarly, Cohen and Zarowin (2010) demonstrated that M&A is a means to obtain control rights over target firms by making a targeted investment. In

addition, the results of Levi and Zhang (2014) revealed that there is REM in acquiring firms to overstate the results during the M&A period to improve market confidence. Regarding the long-term effects of M&A, some studies have found negative or insignificant returns for both target and acquiring firms (Tampakoudis & Anagnostopoulou, 2020).

The present work is based on a hypothesis that seeks to determine whether there is a significant relationship between CSR and REM in R&D-intensive firms involved in M&A transactions. Therefore, we will test the following hypothesis:

H1: CSR is negatively associated with REM in high R&D intensity firms involved in M&A transactions.

2.2 Moderating effect of GCG on CSR-REM relationship

The good governance score is introduced to capture how a better corporate governance practice, as an oversight factor, affects earnings management (Susanto & Pradipta, 2016). Therefore, board supervision influences managerial discretion and induces firms to be more transparent in financial reporting (Eng & Mak, 2003; Rossi *et al.*, 2015). The study of Chang *et al.* (2015) showed that corporate governance is an important control measure of any business organization, which affects all facets of the accounting system of firms. Indeed, when solid, corporate governance can mitigate opportunistic managerial behavior that leads to earnings management, poor earnings quality, and unfavorable portfolio selection (Ewert & Wagenhofer, 2005).

However, empirical evidence has shown that earnings management and corporate governance have a positive relationship in a merger. For example, Lehmann (2016) confirms that the board's role in preventing earnings management depends on the underlying incentives to engage in them.

Within this framework, the present work aimed to investigate the moderating effect of good corporate governance on the relationship between CSR and REM of R&D-intensive firms involved in M&A transactions. Indeed, due to information asymmetry, merged firms with information advantages tend to manage their earnings upward before the merger announcement in the absence of external attention to prepare for M&A success.

The implementation of GCG plays a strategic role in enhancing the credibility of the company's business processes that will encourage corporate social responsibility disclosure, as it is related to one of the principles of GCG, namely transparency, and can decrease REM practices (Mahdalena *et al.*, 2019). Based on previous studies, we expect the joint effect of CSR and GCG on REM to be stronger than the individual

effect of each of them. Accordingly, we expect that GCG will strengthen the negative relationship between CSR and REM. This leads us to state the following hypothesis:

H2: Good Corporate Governance strengthens the negative relationship between CSR and REM in R&D-intensive firms involved in M&A.

3. Research design

3.1 Sample Selection and Data Sources

The sample included U.S. firms that were listed in the S&P 500 index between 2015 and 2021. The final panel covers 113 listed U.S. firms, corresponding to 1960 firm-year observations. In our empirical analysis, the data on CSR scores were selected from the Thomson Reuters-ASSET 4 database. Specifically, ASSET 4 provides environmental, social, and governance information. To build an M&A database, we used companies' annual reports. For the remaining variables, the information was collected from Thomson Reuters DataStream.

3.2 Sample division

The sampling process is presented as follows: In the first step, we relied on two groups of firms according to their R&D intensity. Brown's (1997) method was adopted to distinguish high and low R&D intensity companies. Indeed, this author considers companies with a high potential for innovation to be those with an R&D intensity above the industry average for firms that have reported positive R&D spending. Therefore, we divided the total sample into a test sample consisting of companies that have high innovation potential and a control sample that encompasses companies with low R&D intensity. For that reason, we used the control sample assuming as normal the accounting behavior of less innovative companies, the idea being that they have no incentive to manage their earnings abnormally (Chouaibi *et al.*, 2019). In a second step, we subdivided the test sample into two groups according to the participation or non-participation of firms in M&A operations (Khlifi & Zouari, 2021). Thus, the test sample included merged and acquiring firms, and the control sample included non-merged firms. We could rank each of the two groups as follows:

G1: firms involved in M&A transactions

G2: firms not involved in M&A transactions

The data collection of the firms participating in M&A transactions was carried out based on the following criteria:

- 1) Index: S&P 500
- 2) Acquirers and targets are U.S. companies
- 3) The target company must be listed on the U.S. market (NYSE, AMEX, NASDAQ)

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- 4) The transaction has been completed successfully
- 5) The minimum size is 1 million U.S. dollars
- 6) The transaction must be closed within the cited period (from 01/01/2014 to 31/12/2020)
- 7) For a firm to be considered merged, the new owner must own the majority of the merged company's assets (i.e., more than 50% of the assets)
- 8) The M&A transaction must be between U.S. companies only

Table 1 summarizes the sample composition, and Table 2 presents the distribution of firms by industry.

Table 1. Sample selection

Panel A: Total sample selection			
Sample	No. of firms		
<i>Initial sample</i>	500		
Exclusion of financial firm	65		
Exclusion of Firms with missing ESG score	25		
Exclusion of data on Firms with missing data	130		
<i>Second sample</i>	280		
Exclusion of low R&D intensity firms	167		
<i>Final sample</i>	113		
Panel B: Sample distribution according to R&D intensity			
<i>Sample</i>	#firms	#Obs.	#%
Test Sample (high R&D intensity firms)	113	792	40.35%
Control Sample (low R&D intensity firms)	167	1169	59.65%
Total	280	1960	100 %
Panel C: Distribution of high R&D intensity firms according to M&A			
Sample	#firms	#Obs.	#%
Test Sample (merged and acquiring firms)	95	679	84%
Control Sample (non-merged firms)	18	126	16%
Total	113	791	100 %

Table 2 provides some details on the sectors in which the sampled companies operate, using U.S. SIC codes. The industrial and service sectors are well represented

in the sample, while none of the sample companies are involved in the construction, finance, insurance, real estate, or public administration sectors.

Table 2. Sample distribution by Sector

Panel A: Total sample distribution					
SIC code	Industry	R&D intensity sample		M&A sample	
		<i>N</i>	%	<i>N</i>	%
1000-1999	Mining and construction	43	15.36%	15	12.85%
2800-2890	Chemicals	76	27.14%	32	29.28%
3000-3999	Manufacturing	59	21.07%	19	26.42%
5063-5084	General Industrials	21	7.5%	12	7.85%
5200-5999	Retail Trade	44	15.71%	17	11.42%
7000-8999	Services	37	13.21%	18	12.14%
<i>Total</i>		280	100%	113	100%

Panel B: sample distribution according to the industry-median of R&D intensity				
Industry		Median RDI	Test sample	Control sample
1000-1999	Mining and construction	0,058	15	26
2800-2890	Chemicals	0,028	32	41
3000-3999	Manufacturing	0,040	19	44
5063-5084	General Industrials	0,047	12	4
5200-5999	Retail Trade	0,030	17	26
7000-8999	Services	0,062	18	26
Total			113	167

Panel C: Distribution of the sample of high R&D intensity firms according to participation or not in M&A transactions by sector of activity			
Industry		Test sample	Control sample
1000-1999	Mining and construction	11	4

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2800-2890	Chemicals	29	3
3000-3999	Manufacturing	17	2
5063-5084	General Industrials	8	4
5200-5999	Retail Trade	14	3
7000-8999	Services	16	2
Total		95	18

3.4 Empirical model

This study used the multiple linear regression method to estimate a model that will test the effect of CSR on REM practices and the moderating effect of GCG on CSR-REM relationship in R&D-intensive firms involved in M&A transactions. Empirically, the following model is presented:

$$REMI_{it} = \alpha_0 + \alpha_1 CSR_{it} + \alpha_2 CG_{it} + \alpha_3 CSR_{it} * CG_{it} + \alpha_4 SIZE_{it} + \alpha_5 LEV_{it} + \alpha_6 ROA_{it} + \alpha_7 Q_{it} + \alpha_8 COVID-19_{it} + \alpha_9 M\&A_{it} + \epsilon_{it}$$

Where;

- REMI: real earnings management index;
- CSR: corporate social responsibility score;
- CGS: corporate governance score;
- SIZE: firm size;
- LEV: leverage ratio;
- ROA: return on assets;
- Q: Tobin's Q
- M&A: Merger and acquisition;
- ε: Error term;
- i: firm subscript; and
- t: time subscript.

3.5 Variables measures

Dependent Variable: Real Earnings Management index (REMI)

The modeling of the REM was developed through the study of Roychowdhury (2006), which is often used by other researchers and has proven to be valid (Cohen *et al.*, 2008; Cohen & Zarowin, 2010; Zang, 2012; Chouaibi *et al.*, 2019; Kuo *et al.*, 2021; Khelifi & Zouari, 2021). Roychowdhury (2006) mentioned three ways of measuring real earnings management using models developed by Dechow *et al.* (1998): Abnormal Operating Cash Flow (Abn_CFO), Abnormal Discretionary Expenditure (Abn_DISEXP), and Abnormal Production Cost (Abn_PROD). These

proxies of real earnings management are determined by subtracting the normal levels of the variables from the real levels of the variables. This means that the error term reflects the abnormal level. The models given below calculate the normal levels of the variables. Hence, the three models are as follows:

- 1) $CFO_{it}/A_{it-1} = \alpha_1(1/A_{it-1}) + \alpha_2(SALES_{it}/A_{it-1}) + \alpha_3(\Delta SALES_{it}/A_{it-1}) + \varepsilon_{it}$
- 2) $DISEXP_{it}/A_{it-1} = \alpha_1(1/A_{it-1}) + \alpha_2(SALES_{it-1}/A_{it-1}) + \varepsilon_{it}$
- 3) $PROD_{it}/A_{it-1} = \beta_1(1/A_{it-1}) + \beta_2(SALES_{it}/A_{it-1}) + \beta_3(\Delta SALES_{it}/A_{it-1}) + \beta_4(\Delta SALES_{it-1}/A_{it-1}) + \varepsilon_{it}$

where

CFO_{it} = Cash Flow from Operations

A_{it-1} = Total Assets at t-1

$SALES_{it}$ = Net sales

$\Delta SALES_{it}$ = Change in net sales between t and t-1

$DISEXP_{it}$ = Discretionary expenses in period t

$SALES_{it-1}$ = Change in net sales between t-1 and t-2

$PROD_{it}$ = Production costs in period t

ε_{it} = Residual of the regression at time t

Subsequently, we cumulated the three proxies to verify the global effect of REM, replicated in the REM_proxy variable. The residuals of operating cash flow and the abnormal level of discretionary expenses were multiplied by (-1) as higher values designate higher levels of these proxies decreased by the firms to manipulate earnings. Consequently, multiplying these proxies by -1 makes REM interpretation less complex.

In this sense, the REM index is equal to the sum of the three measures of real earnings management:

$$REMI = A.CFO + A.DISEXP + A.PROD$$

Independent variables:

Corporate social responsibility (CSR)

Based on the literature, this study used the economic, social, and environmental scores reported by ASSET4 as a measure of CSR score. Indeed, the CSR score reflects the aggregation of economic, social, and environmental performance by measuring their average. Consistent with previous studies, we excluded the corporate governance score in the CSR measure because corporate governance is considered a separate construct from other CSR dimensions (Hong *et al.*, 2012; Kim *et al.*, 2012).

Good Corporate Governance Score (GCGS)

Several studies have shown that corporate governance plays a crucial role in constraining earnings management by monitoring managers' opportunistic behavior

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(Prior *et al.*, 2008; Lehmann, 2016; Susanto & Pradipta, 2016). Nevertheless, our study used the corporate governance score developed and presented by the Thomson Reuters ASSET4 database that includes five main rankings: board composition, compensation systems, board roles, shareholder rights, and vision and strategy (Ferrero *et al.*, 2015).

Control variables

According to previous literature and the theoretical framework, we used the following control variables: Firm size (SIZE) measured by the log of total assets, leverage (LEV) measured by total debts divided by total assets, return on assets (ROA) to control for a firm's profitability, and Tobin's Q measured as the rapport between market value and total assets. The coronavirus (COVID-19) is a dummy variable that takes the value 1 if the study period is 2020 and 0 otherwise (Bae *et al.*, 2021). The merger and acquisition (M&A) variable takes 1 if the company is involved in M&A transactions and 0 otherwise (Khlifi & Zouari, 2021).

Table 3 presents the definitions of all variables in this study.

Table 3. Variables measures

Variable	Symbols	Measures
Panel A: Proxies for REM		
Abnormal operating cash flows	A.CFO	$CFO_{it}/A_{it-1} = \alpha_1 (1/A_{it1}) + \alpha_2 (SALES_{it}/A_{it-1}) + \alpha_3 (\Delta SALES_{it} / A_{it1}) + \varepsilon_{it}$
Abnormal discretionary expenses	A.DISEX	$DISEXP_{it}/A_{it} = \alpha_1 (1/A_{it1}) + \alpha_2 (SALES_{it-1}/A_{it-1}) + \varepsilon_{it}$
Abnormal production costs	A.PROD	$PROD_{it}/A_{it1} = \beta_1 (1/A_{it1}) + \beta_2 (SALES_{it}/A_{it1}) + \beta_3 (\Delta SALES_{it}/A_{it-1}) + \beta_4 (\Delta SALES_{it-1}/A_{it-1}) + \varepsilon_{it}$
A.PROD		
Real earnings management index	REMI	A.CFO + A.DISEXP+ A.PROD
Panel B: Independent variables		
Corporate social responsibility	CSR	The average score of the three dimensions (economic, social, environmental)
Good corporate governance	GCGS	Good corporate governance score.
Panel C: Control variables used in the models		
Firm size	SIZE	Natural logarithm of total assets
Leverage	LEV	Debt-to-equity ratio
Profitability	ROA	Return to total assets ratio
Tobin's Q	Q	measured by the ratio of the market value of shareholders' equity and the book value of liabilities to the book value of assets

Variable	Symbols	Measures
Coronavirus	COVID-19	takes 1 if the study period is 2020 and 0 otherwise.
Merger and acquisition	M&A	takes 1 if the company is involved in M&A transactions and 0 otherwise

4. Results and discussion

4.1 Descriptive statistics

To compare the two samples, we used the mean difference tests.

Table 5. Means of model variables according to the M&A firms (involved or non-involved)

Variables	M&A firms	Number of observations (firms-years)	Means
REMI	Involved in M&A	665	0.025
	Non-involved in M&A	126	-0.015
GCGS	Involved in M&A	665	0.791
	Non-involved in M&A	126	0.658
CSR*GCGS	Involved in M&A	665	0.746
	Non-involved in M&A	126	0.743
SIZE	Involved in M&A	665	16.807
	Non-involved in M&A	126	17.085
LEV	Involved in M&A	665	0.282
	Non-involved in M&A	126	0.239
ROA	Involved in M&A	665	0.034
	Non-involved in M&A	126	0.017
Q	Involved in M&A	665	0.506
	Non-involved in M&A	126	0.029
COVID-19	Involved in M&A	665	0.468
	Non-involved in M&A	126	0.112

Note: REMI is Real earnings management index, CSR is corporate social responsibility, GCGS is good corporate governance score, SIZE is firm's size, LEV is leverage ratio, ROA is return on assets, Q is Tobin's Q, and COVID-19 is Coronavirus.

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Table 6. Student test on explanatory and explained variables according to the M&A firms (involved or non-involved)

Variables	Unequal variance Hypotheses	T test of equality of means		
		T	P value	Differences Between means
REMI	The unequal-variance assumption	-3.282	0.000	-0.040***
CSR	The unequal-variance assumption	-5.440	0.000	-0.115***
CSR*GCGS	The unequal-variance assumption	-4.007	0.000	-0.048***
SIZE	The unequal-variance assumption	-1.592	0.056	-0.189*
LEV	The unequal-variance assumption	-3.138	0.001	-0.043***
ROA	The unequal-variance assumption	-0.966	0.167	-0.016n.s
Q	The unequal-variance assumption	-27.108	0.000	-0.844***
COVID-19	The unequal-variance assumption	-7.452	0.000	-0.541***

Note: REMI is Real earnings management index, CSR is corporate social responsibility, GCGS is good corporate governance score, SIZE is firm's size, LEV is leverage ratio, ROA is return on assets, Q is Tobin's Q, and COVID-19 is Coronavirus. * p < 10%; ** p < 5%; *** p < 1%; n.s = non-significant

Tables 5 and 6 show a significant difference in the REM index between the two groups of firms (Involved in M&A /non-involved in M&A). The results in Table 5 indicate that non-merged R&D-intensive firms are more involved in REM practices (the average of R&D-intensive firms involved in M&A (0.025) is lower than that of non-merged ones (-0.015). Table 6 indicates that the Mean difference test has a t-student value of -3.282, which is statistically significant at the 1% level.

Regarding CSR, the results show that the average of the test sample (control sample) is about 0.513 (0.417). This finding indicates that R&D-intensive firms involved in M&A are more implicated in manipulating real activities from their CSR activity than non-merged ones. This mean difference is significant (t-student = -5.440; P=0.000).

For the moderating effect of the GCG on the relationship between CSR and REM, the results show a significant difference between the two groups of firms. Moreover, for this variable, the test sample mean (0.746) is higher than that of the control

sample (0.743). The mean difference test for the hypotheses of unequal variance shows that the t-student (-4.007) is significant at the 1% threshold.

For the control variables, the firms in our sample are generally large: The average sizes of the firms belonging to the test and control samples are 16.807 and 17.085, respectively. For the debt variable, the average value of debt for the test sample is 0.282, while for the control sample is 0.239. When observing the mean difference test for the unequal variance hypotheses, we notice that the t-student has a value of - 3.138, which is significant at the 1% level. Regarding the return on assets, the results show that there is no significant difference between the two groups.

The Tobin's Q variable has a significant difference between the two samples of firms, which shows the importance of stock market performance in the M&A market. It turns out that R&D-intensive merged firms (mean equals 0.506) are more profitable than non-merged ones (mean equals 0.029). This difference between the means is significant between the two sample groups (t-student = -27.108 significant at the 1% threshold). Finally, the results of the COVID-19 variable indicate a considerable difference between the two sample groups. Indeed, the mean of merged firms (0.468) is higher than that of non-merged ones (0.112). This difference between the means is significant between the two samples (t-student = -7.452 significant at the 1% threshold).

4.2 Pearson correlation matrix

The Pearson correlation matrix shows that all correlation coefficients between the explanatory variables are less than 0.7, implying the absence of the multicollinearity problem (Table 7).

Table 7. Pearson correlation matrix

	CSR	CSR* GCGS	M&A	SIZE	LEV	ROA	Q	COVID- 19
CSR	1							
CSR* GCGS	-0.003	1						
M&A	-0.072	-0.019	1					
SIZE	0.154	0.137	-0.015	1				
LEV	-0.016	0.004	0.057	-0.127	1			
ROA	0.021	-0.011	0.016	0.008	-0.051	1		
Q	0.022	-0.019	0.045	-0.230	-0.063	0.025	1	
COVID-19	0.056	0.022	0.037	0.045	-0.230	-0.063	0.025	1

The moderating role of good corporate governance on the relationship between corporate social responsibility and real earnings management

Note: CSR is corporate social responsibility, GCGS is good corporate governance score, M&A is merger and acquisition, SIZE is firm's size, LEV is leverage ratio, ROA is return on assets, Q is Tobin's Q, and COVID-19 is Coronavirus. All correlations between variables are significantly smaller than 0.7 (threshold at which serious problems of multi-collinearity begin, Kervin, 1992). In the Pearson test (T-statistics are reported in parentheses) and for the index of conditioning, we found that these variables are distinct from each other and are not significant (correlation thresholds above 10% and the packaging is less than 1000).

4.3 Discussion

In what follows, we will present the regression results of the hypotheses tests that relate CSR and GCG with REM in the context of R&D-intensive firms during M&A transactions.

Table 8. Regression results

Variables	Full sample		Test sample		Control sample	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant	-0.328***	-3.53	-0.620**	-2.17	-0.809***	-2.66
CSR	-0.029**	-2.08	-0.039**	-2.23	-0.016	-1.60
CSR* GCGS	-0.0247	-1.57	-0.031**	-2.16	-0.055	-1.48
SIZE	0.030***	4.44	-0.014**	-0.99	0.041***	2.85
LEV	-0.036	-1.11	-0.025	-0.90	0.001	0.09
ROA	0.176***	4.88	0.131**	2.79	0.285***	4.01
Q	-0.009	-1.92	0.009***	1.92	-0.013	-1.40
COVID-19	-0.024**	-1.74	-0.047**	-2.97	-0.032	-0.46
M&A	-0.041*	-1.71	-	-	-	-
Firmfixedeffects	Included		Included		Included	
Yearfixedeffect	Included		Included		Included	
R2 within	0.117		0.052		0.002	
F-statistics	44.90		45.29		38.89	
Nb. Of Obs.	791		665		126	

Note: CSR is corporate social responsibility, GCGS is good corporate governance score, SIZE is firm's size, LEV is leverage ratio, ROA is return on assets, Q is Tobin's Q, COVID-19 is Coronavirus, and M&A is merger and acquisition. Statistical significance at the 10%, 5%, and 1% levels are indicated by *, **, and ***, respectively.

The statistical tests in Table 8 shows that all our hypotheses are confirmed. As can be seen in Table 8, for H1, there is a negative and significant impact of CSR on REM

for the total and test samples. After estimating our empirical model, we present the following results; a negative coefficient ($\beta = -0.039$) and statistically significant at the 5% threshold for merged R&D-intensive firms, and a positive coefficient ($\beta = 0.011$) and statistically insignificant for non-merged ones. For the total sample, the coefficient is negative ($\beta = -0.029$) and significant at the 1% level. This finding indicates that firms engaged in CSR activities are less likely to manipulate real activities.

Thus, we can conclude that the more heavily R&D-intensive merged firms are engaged in CSR activities, the more likely they are to act responsibly when reporting their financial statements. Nonetheless, the validation of our research hypothesis is consistent with the assertion that CSR activities reduce REM among highly R&D-intensive firms participating in the M&A market. Indeed, a focus on the effect of CSR's ethical involvement on financial reporting ensures a good relationship with stakeholders (Cho *et al.*, 2015); thus, the R&D and M&A contexts provide a favorable environment for the application of sustainability from CSR activities, which leads to decreasing REM practices. In short, merged firms with high R&D intensity are the most committed to CSR practices to combat REM. This result suggests that the presence of CSR limits the practice of REM in the presence of the two growth strategies within a firm at the same time. Therefore, Hypothesis H1 is validated.

The second hypothesis aims to test the moderating effect of GCG score on the CSR-REM relationship. The results for the test sample showed a negative coefficient ($\beta = -0.031$) significant at the 5% level. For the full and control samples, we found negative signs ($\beta = -0.0247$ and $\beta = -0.055$) but non-significant. These results are interesting regarding the active role played by CSR in reducing the extent of REM of R&D-intensive firms participating in M&A transactions. However, when incorporating governance, the effect of CSR remained negative, i.e., the interaction between CSR and GCG reduces REM. With a negative interaction coefficient, we can conclude that GCG with high CSR commitment is very effective in reducing REM for R&D-intensive firms participating in M&A transactions. Hence, hypothesis H2 is accepted.

To ensure the credibility of our empirical findings, we included several control variables that are likely to shed light on the impact of these variables on REM. The empirical results show that the variable of the size of the U.S. firms is significant for all three samples, but the variable of the firm's debt has no significant effect on REM for the three samples of our study. However, the ROA variable has a positive ($\beta = 0.131$) and significant effect at the 5% level for the test sample, and for the control sample the coefficient is positive ($\beta = 0.285$) and significant at the 1% level. Moreover, for the total sample, the coefficient is positive ($\beta = 0.176$) and significant at the 1% level. This implies that managers are engaged in REM within highly R&D-intensive firms during M&A transactions.

Concerning Tobin's Q, the results of this regression show that this variable has a positive ($\beta = 0.009$) and significant impact at the 1% threshold on the REM practices for the test sample but negative ($\beta = -0.009$ and $\beta = -0.013$) and non-significant for the full and control samples. Therefore, the stock market is considered a favorable field for the management of merged R&D-intensive firms to manage their earnings. This result highlights the importance of this variable in determining REM in merged R&D-intensive firms.

As for the COVID-19 variable, because the COVID-19 pandemic was unexpected, studies on COVID-19 have focused primarily on market responses. As a result, the relationship between the COVID-19 outbreak and REM practices is limited. Thus, this study provided significant insights into the COVID-19 and REM relationship. This variable has a negative ($\beta = -0.024$ and $\beta = -0.047$) and significant impact on REM practice at the 5% level for the total and test samples but negative ($\beta = -0.032$) and non-significant for the control sample. This finding revealed that firms with high R&D intensity in the most severely affected regions were less likely to engage in REM during M&A transactions.

Finally, M&A has a negative ($\beta = -0.041$) and significant impact at the 10% threshold on REM practice in R&D-intensive firms. This result could also be justified by the fact that firms engaged in innovation activities and M&A operations weakly practice REM.

5. Conclusion

This study aimed to determine the effect of CSR on REM and the moderating effect of GCG on CSR-REM Relationship within R&D-intensive firms during M&A transactions to provide more insight into the relationship between responsible governance factors and REM in the presence of R&D and M&A. Based on a sample of 113 R&D-intensive firms between 2015 and 2021. Our total sample was divided into two groups according to R&D intensity (high/low R&D intensity). We then subdivided the test sample (high R&D intensity) into two sub-samples according to M&A operations (merged and non-merged firms). This tool allowed us to specify the properties of the data we collected.

For more robust results, we used the multiple linear regression model. The regression results show that CSR and GCG score have a negative and significant effect on REM for the full and test samples but non-significant for the control sample. As a result, CSR activities can help gain and maintain a competitive advantage by building a strong relationship with key stakeholders (Carroll & Shabana, 2010). In addition, good governance mechanisms strengthen the board of directors and the management of the firm to achieve its objectives by maximizing the wealth of the shareholders' interests. This appears to be in line with the firm's interests to control the published

results and discourage REM practices. The moderating effect of GCG is negative and significant only for the sample test, implying that the interaction between GCG and high CSR commitment reduces REM for R&D-intensive firms involved in M&A transactions.

Our results have practical implications that may interest academic researchers and practitioners who wish to explore the impact of CSR and GCG on REM practices in the M&A market. The present work has limitations and leaves many questions open. The first limitation consists of the difficulty of collecting data for the M&A variable, which may skew the results. Second, this study uses a sample of only American firms, so it is not possible to apply the results for real earnings management to other world regions, such as, UK or Europe. Also, our study did not address the different types of M&A for example; stock-for-stock mergers.

To more fully understand the studied relationship and shed light on this critical area of research, additional work is needed. Future research could investigate the moderating effect of environmental and social scores on the REM-GCG relationship with a larger sample, in particular, an international comparison in the context of different types of M&A.

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