

Capital Market Penalties and Corporate Violations of the Three Pillars (Operations, Reporting, and Compliance) after COSO 2013 Internal Controls: Integrated Framework

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Introduction

Current literature is somewhat unclear on how corporate violations under the new set of governance environments versed in the Internal Controls Integrated Framework issued by COSO (acronym of Committee of Sponsoring Organizations of the Treadway Commission) influence shareholders' activism. Initially published in 1992, these guidelines faced a significant revision with proactive improvements in 2013. Since the first emission, this guidance has focused on providing safe-keeping basic standards for organizations to follow regarding the integrity of corporate governance and enterprise risk management by designing and implementing stable internal controls. The handbooks' primary approach builds upon an environment of permanent improvement of self-regulatory governance in three main catalysts or pillars: (i) operational safety; (ii) financial statements reporting assurance; and (iii) regulatory compliance.

Empirical evidence poses particular relevancy on investors' reactions to violations of the three pillars: operational safety, financial statements reliability, and regulatory compliance. For example, corporate quality failures have a punishable component in the capital markets regarding operational execution. Recalling products have profound reputational costs in investors' returns (Thirumalai and Sinha, 2011; Thomsen and McKenzie, 2001). Quality efforts on financial statements are also eloquent in literature. Defects in financial statements take an economic levy on stocks' returns (Karpoff, Lee, and Martin, 2008; Staubus, 2005). Stockholders are not negligent regarding the value of firms' efforts in regulatory compliance (Gangl and Torgler, 2020; Goncharov, Werner, and Zimmermann, 2006). Flaws complying with authorities also face disciplinary sanctions on securities valuations (Badertscher, Katz, Rego, and Wilson, 2019; Sampath, Gardberg, and Rahman, 2018).

This ample academic evidence illustrates how internal controls violations generally explain shareholders' activism in general. However, precise details warrant deeper investigation because of two significant constraints. In the first instance, most assumptions in previous literature delimitate the analysis to the outdated framework of COSO, 1992. In the original version, financial reporting was the only pillar requiring evidence of proper documentation. The revised version includes this requirement across the three pillars. Capital market participants became aware of firms' implementing the new framework as part of the auditor's opinion in the first financial statement after the recommended year in the guidance. Academic evidence documents that 83% of the publicly listed companies, firms included in this study sample, accelerated the adoption of the Internal Controls-Integrated Framework during the year 2013 (Lawson, Muriel, and Sanders, 2017). The first objective illustrates significant differences in the investors' response regarding internal control systems based on actual implementation failures.

The second factor that motivates this research denotes the potential homogeneous component across violations to the pillars in the COSO (2013) concerning market value. A large body of current literature precise in their observations only financial reporting controls violations. This article expands this knowledge to operational quality and regulatory compliance controls. Clarifying differences in the influence of the three breaches in explaining investors' responses represents the second objective.

To address these two primary objectives, this study's research question is, Do the updated version of the pillars of internal controls -operational efficiency, reporting reliability, and compliance adherence, influence market value penalties after controlling execution failures? By addressing this inquiry, this study expands and clarifies the current understanding of (i) the COSO intervention influencing market value and (ii) the distribution of investors' response reacting to corporate violations in the three pillars. These contributions rely on statistically testing the moderation effect using a bootstrapping

methodology found in Hayes (2012). The moderating effect represents the new updated version between the securities' cumulative abnormal returns and each type of internal controls violations.

The observed sample consists of three types of unique events that violate the principles of the Internal Control-Integrated Framework (COSO, 2013). The first set represents operational failures set represents a group of firms facing quality issues causing a recalling product from the market (failure identified by the U.S. Foods and Drugs Administration). Firms' restatements represent failures of financial statements quality after a filling defect in the accounting process (material misrepresentation). Firms violating the Securities and Exchange Act provisions (SEC, 1934) regarding international bribery comprehend the regulatory compliance issues.

First, the structure of this article develops based on accepted academic literature the study hypothesis. This order then details the sample characteristics, collected data, and methodological approach. A subsequent section presents the study findings and finishes with an exposition of the main conclusions.

Hypothesis Development

The theoretical background of this study relies on information asymmetry principles. This theory focuses on understanding the consequences of investors' limited visibility of firms' actions with potential performance influence. The latest version of the internal control guidance centers the improvements to increase organizations' risk management abilities and auditing execution (COSO, 2013). Firms implementing these safe-keeping standards fall into the asymmetric assumptions where investors, instead of relying on the executives' information disclosing qualities, could depend on the adherence to this framework regarding performance execution (Jimenez-Andrade, Fogarty, and Boland, 2021). Therefore, this study can confidently rely on the asymmetric assumptions to build upon the role of firms following the latest COSO parameters and the relationship between their behavior and market expectations.

Information asymmetry connects the signaling process between owners, market value, regulators, and executives' behavior (Bartov and Bodnar, 1996). To mitigate higher transactional costs and lowered stock prices between investors and firms when better risk practices incentivize safer economic environments. Academic literature has a plethora of examples of such actions. The most compelling evidence regarding corporate governance and COSO argues that enactments intended to improve monitoring systems (such as board and audit committees) reduce owners' and firms' asymmetries (Cormier, Ledoux, Magnan, and Aerts, 2010).

The main argument to theorize the study hypothesis relies on the notion that the updated version issued by the COSO reduces information asymmetry between owners and firms. The new framework should result in fewer market penalties than its predecessor because the latest version contains several provisions regarding corporate governance improvements. In this sense, internal controls, proper documentation, and a more inclusive control environment have proven to be constructive managerial practices in organizations' risk-identification and -mitigation process in general (Goh and Li, 2011). Therefore, in conjunction with the asymmetric process, firms' risk levels are theoretically lower due to more regulation.

Previous literature holds individual support for market penalties to violations in each one of the pillars of internal controls. This prediction relies on the substantive difference (across them) arising from the new control environment. The latest version requires firms' proper documentation for each one of the pillars, not only for the financial statement preparation process. In this sense, one of the implications is documenting actors' accountability. Executives holding fiduciary duties have lower incentives to behave in what could legally compromise them personally (MacCrimmon and Wehrung, 1990). Moreover, these less risky alternatives (who could make them accountable) are preferred even though their decisions may reduce their economic incentives (Jimenez-Andrade and Fogarty, 2019). These deterrence mechanisms imply a more consciously (legally) oriented mindset dominating their decision-making process.

Despite proper documentation would only attenuate the reputational penalties in the two pillars, operations and regulatory compliance, the new guidance includes an enhancement in the financial statements with an improvement in the materiality assessment process from auditors. In this guidance, auditing practices in financial reporting represents a reduction also of asymmetric levels and transaction costs (Almutairi, Dunn, and Skantz, 2009; Maksymov, 2021). Therefore, the quality in financial reporting because of the new guidance also attenuates the reputational penalties.

Proper documentation and enhanced risk assessment process in all three areas have multiple implications aside from the ones related to accountability. The effect of this new framework concerning the market penalties when organizations

fail in the execution remains uncertain. Because financial statements quality was the only pillar fully enforced (COSO, 1992), the other pillars, operational quality and regulatory compliance faced higher and distinct execution riskier levels to firms and their owners under the previous guidance. More so, because organizational risks decrease with lower asymmetry levels (between firm and managers), market penalties to internal controls violations, although present, there is a reasonable theoretical expectation that the influence of the new regulatory enactment would attenuate them. The influential relationship of the updated (or current) COSO framework about the market penalties, even though harmful, should be a lesser effect than the original version. Therefore, the first prediction of this study states the following:

H₁: The revised framework issued by the COSO attenuates the negative relationship between stock returns penalties and violations of the internal control pillars (a) operational safety, (b) financial statements quality, and (c) regulatory compliance.

Data and Methodology

This study details the following data collection process, methodology, and supplementary analysis to address the research question, objectives, and hypothesis while ensuring quality in this research. Sample detailing specific Internal Controls-Integrated Framework (COSO, 2013) violations, securities' returns, and firms' characteristics have an individual section below. The designed methodology refers to widely accepted statistical procedures found in previous literature. Also, this section concludes with an additional segment that states extra statistical oriented to enhance the quality of the findings.

Data and Variables

The study samples three types of internal control pillars violations: operational failures, financial statement quality issues, and regulatory transgressions. The time horizon of analysis is five years before and after the enactment of COSO (2013). This selection allows the study to explore fully implemented controls within organizations and then contrast these events with the previous environment of control (referred to in COSO, 1992). Therefore, the studied timeframe comprehends violations between 2008 and 2018 centered in 2013 for studying the before and after the event.

The primary source for the operational quality failures (the first pillar) corresponds to Class I life-threatening recall archives issued by the Food and Drug Administration (FDA) from 2008 to 2018. Consistent with previous literature, this dataset evidence quality breaches in organizations for not adequately following implemented controls in ensuring safety standards with the highest financial impact to organizations (Thirumalai and Sinha, 2011). The number of collected cases ascends to 498 life-threatening recalls. However, not every case qualifies for this investigation. Only publicly listed companies permit to observe their securities' returns. The total observations of companies who faced a major recalling their product represent 164 (grouping variable *Quality* means 1=present, 0=otherwise).

Regarding financial statement quality violations, the sample includes firms that restate their financial information. The data source for this information is COMPUSTAT collection. These observations are widely used in academic literature in understanding reporting quality (e.g., Hasnan, Razali, and Hussain, 2020; Palmrose, Richardson, and Scholz, 2004). Companies issuing such documents evidence limited (or inadequate) accounting preparation controls (in the implementation or execution) in revealing their economic position to owners. Collected restatement during the observed timeframe ascended to 110 out of 234 cases (grouping variable *FSQ* means 1=present, 0=otherwise). However, many firms issued more than one restatement. Repetition was not allowed for the quality of this study. To avoid any potential lagged (or periodic) effect, only the first restatement issued by the company corresponds to an observation (in this case, the oldest in the studied horizon).

The last pillar is a representative sample correlated to regulatory compliance issues from companies obligated to follow the Internal Controls-Integrated Framework (COSO, 2013) enactment. Observations represent violations of the Foreign Corrupt Practices Act. The formal source of this data derives from the press releases issued by the SEC regarding their formal investigations. Empirical evidence poses particular relevance in these events because of the multidimensional implications within organizations for not implementing or enforcing adequate internal controls that can prevent employees from engaging in illegal activities on behalf of the companies (Jimenez-Andrade, Fogarty, and Jonas, 2021; Persons, 2019, 2020). The total number of qualifying cases (without the non-listed, international companies or other unqualifiable characteristics) ascends to 96 firms (grouping variable *RegComp* means 1=present, 0=otherwise).

These archival datasets supplied several pieces for information per record. For instance, firms' names helped identify the unique listed company number. Also, event date aided in addressing pre and post COSO events (grouping

variable *COSO13* where 1=after 2013, 0=otherwise). In addition to the collected events, and for isolating unique effects of the violations over the market returns as recommended in related academic literature, a sample of firms (and variables) absent of a COSO violation enriches the dataset. This unique compendium refers to the matching peer firms in same industry, event date, and closest value of their assets size. Besides the measuring benefits of the unique effects, this additional data helps control systemic effects happening in the economy at the violation time. The grouping variable for identifying the study event and the matching sample is Violation (where 1=presence, 0=otherwise). Noteworthy, the sampled data does not include any early adopters disclosed in their financial statements. Figure 1 displays the timeline of wrongdoings, events, and COSO implementation (2013). [See Figure 1, pg. 484]

Several control variables found in related literature enrich the quality of this research. This study parsimoniously controls for two main factors explaining market returns from each firm. The first set of variables represents firms' financial performance. Academic research finds size and profitability indicators as keen determinants of securities' pricing (Gill, Biger, and Mathur, 2011). For size, the variable Assets quantifies the value of firms' total assets. Profitability is measured with the most influential explanatory variables: net income (*NI*), return on equity (*ROE*), return on assets (*ROA*), and firms' market value indicator over the valuation of their assets (*TobinsQ*). The second group of variables captures industrial effects influencing securities' pricing. Previous research suggest a strong correlation between industrial performance indexes with stock returns. The industrial control variables for this research are net income, return on equity and return on assets. Boyle, Lewis-Western, and Seidel (2021) find these variables' annual (instead of quarterly) periodicity with the highest explanatory power over stocks' returns within the new internal control's environment.

Using companies' names and dates when the violations occurred, stock returns were collected for measuring the market response. Although academic literature offers several indicators and time horizons for observing investors' reactions, the selected indicator for this study represents the Cumulative Abnormal Return (*CAR*). The main reason for this decision stands on the variable characteristics. The computation of *CAR* isolates and quantifies the unique reaction that could exist due to a specific event (Fama and French, 2008). The variable *CAR* removes the systemic risks and potential lagged effects, as presented in the equation as follows:

$$CAR_{(3,8)} = \sum (R_{i,t} - \{\alpha_i + \beta R_{m,t}\}) \dots \text{Equation 1}$$

Where $R_{i,t}$ represents the risk-free rate. The term $\alpha + \beta R_{m,t}$ accounts for the securities' performance concerning their industry covariance of the firms' beta (β) with the average of the variable R_m . In this sense, $R_{m,t}$ represents the average return securities in a specific window. To capture the overall value reduction, because this study measures the negative returns under an event window, the variable $R_{m,t}$ ($Rm = \frac{\sum R}{N}$) includes the 12-month cumulative size adjustment with a maximum of 10 missing days. These parameters are commonly observed in related literature due to the maximum reliability levels of the lagged effects without compromising the integrity of the measurement with forecasting errors from unnecessary complexity (e.g., Abarbanell and Bushee, 1998; DeFond and Park 2001).

By using *CAR* as a variable also, it will be possible to compare the stockholders' returns before and after the enactment from the COSO. In terms of the timeframe, previous literature recommends the usage of more than one horizon for increasing the quality of the analysis (MacKinlay, 1997). In this sense, the observed horizons are three- and eight-day windows (CAR_3 and CAR_8) for allowing market participants to become fully aware of the violations without exceeding a reasonable time. Therefore, the selection of this variable and its timeframe can be consistent with the main research objective -analysis of the moderating effects between firms' market value penalties as a consequence of violating the three pillars of internal controls in the updated environment of the Internal Controls-Integrated Framework issued in 2013.

Methodology

The hypothesis in this study states the attenuation effect of the framework issued by the COSO in 2013 over the penalties on firms' market value due to the three pillars in the internal controls. Academic literature suggests capturing attenuating effects of one variable (in this case *COSO13*) over the relationship between two variables (*Violation* and $CAR_{3,8}$) moderation tests (Hayes, 2012). Statistical results derive from testing the regression coefficients using bootstrapping techniques using the tool PROCESS within the software SPSS 27 using the following formula:

$$CAR_{3,8} = i + \gamma_1 Violation_{(Quality,FSQ,RegComp)} + \gamma_2 COSO13 + \gamma_3 Violation_{(Quality,FSQ,RegComp)} \times COSO13 + e_y \dots$$

Equation 2

Supplementary Analysis

In order to assess potential statistical flaws, such as type error II (rejecting or accepting the hypothesis erroneously due to a measurement specification), this article's methodology includes a supplementary analysis for testing the consistency of the findings. The additional examination consists in replacing the moderating variable (COSO13) with two variables controlling for one year before (2012: *Control12*) and one after (2014: *Control14*) and one randomly created variable. The reasoning behind this approach is isolating the moderating effect of the updated regulation (issued in 2013) over the dependent ($CAR_{3,8}$) and independent (*Violation*) variables by discarding statistical flaws.

Results

Basic Statistics

From the collected data, some critical statistical indicators arise. Table 1 displays the basic statistics. On average, violations to the Internal Controls-Integrated Framework (COSO, 2013) pillars cost to owners .7% (SD=5%) and 1.7% (SD=9.1%) in the three-day and eight-day window, respectively. In the three-day window, the highest premium refers to violations in the quality of financial statements ($CAR_3=-.8\%$), followed by operational quality failures ($CAR_3=-.7\%$). The less costly violation is observed in the failure to comply with regulations ($CAR_3=-.5\%$). The highest downturn occurs in regulatory compliance ($CAR_8=-2.5$) in the eight-day horizon while equally costly for violating financial statements' quality and operational safety ($CAR_8=-1.5\%$). Lastly, once the new guidance was fully enforced, investors' returns are 33.3% lower –three-day window (and up to 70% in the eight-day), compared to the penalties under the original Internal Controls-Integrated Framework issued by COSO (1992), ($CAR_{3before}=-.9\%$; $CAR_{3after}=.6\%$). Variability after the framework also declines (in the three-day window from 5.4% to 4.5% and for eight-day 10.4% to 7.3%). More detailed primary descriptive and dispersion results are presented in Table 2. In addition, Table 3 displays Pearson's and Spearman's correlation coefficients. [See Tables 1 and 2, pg. 476; Table 3, pg. 477]

Main Hypothesis Results

This study's main hypothesis theorizes the latest Internal Controls-Integrated Framework (COSO, 2013) over the market value penalties associated with corporate violations of the three pillars of internal controls (a. operational safety, b. financial statements quality, c. and regulatory compliance). Using a bootstrap methodology, this testing process starts with the moderation effects of the variable *COSO13* over $CAR_{3,8}$ and *Violation*. Findings are presented in Panel A of Table 4. As presented, the relationship between *Violation* while explaining CAR is negative statistically significant in both the three- and eight-day horizon ($CAR_3: \lambda_1=-.009$, p-value<.05; $CAR_8: \lambda_1=-.019$, p-value<.05). In terms of the direct effect between *COSO13* and $CAR_{3,8}$, the explanatory power also has significant statistical and negative values ($CAR_3: \lambda_2=-.015$, p-value<.05; $CAR_8: \lambda_2=-.018$, p-value<.05). The moderating value, however, results in positive statistical significance only for the three-day horizon. ($CAR_3: \lambda_3=.011$, p-value<.05). In the eight-day window, moderating effects lack significant ($CAR_8: \lambda_3=.017$, p-value>.05). The highest and most significant explanatory model occurs only in the CAR_3 model (R-square=.014, p-value<.05). [See Table 4, pg. 479]

Operational Safety Hypothesis Results

In terms of violations to the operational safety pillar, the hypothesis theorizes the moderating effect on the market returns penalties due to the latest version of the Internal Controls-Integrated Framework (COSO, 2013). In this sense, applying the bootstrap technique to test the moderator *COSO13* over the relationship between *Quality* and $CAR_{3,8}$, results are presented in Panel B of Table 4. As observable, model 3 displaying the three-day horizon has the highest and most significant predictable power (R-square=.028, p-value<.01) compared to model 4, which presents the eight-day findings. Although the coefficient of *Quality* lacks statistical significance in predicting CAR_3 (p-value>.05), predictors *COSO13* and $QualityXCOSO13$ contain such significant values ($\lambda_{COSO13}=-.022$, p-value<.01; $\lambda_{QualityXCOSO13}=.014$, p-value<.05).

Financial Statements Quality Hypothesis Results

The following hypothesis test refers to the market returns penalties to violations of the financial statement's quality and the moderating effect of the updated version of the Internal Controls-Integrated Framework (COSO, 2013). Results from applying the bootstrapping methodology are presented in Panel C of Table 4. Statistical findings are consistent with the previously tested hypotheses. Regressed coefficients in the eight-day window lack statistically significant values (model 4: p-values>0). In the three-day window model, even though *FSQ* has a significant coefficient (p-value<.05) and *COSO13* does not (p-value>.05), the moderator $FSQXCOSO13$ contains positive and statistically significant values ($CAR_3:$

$\lambda_{FSQXCOSO13}=.017$, $p\text{-value}<.05$). The explanatory power of model 1 shares the same significance ($R\text{-square}=.031$, $p\text{-value}<.05$).

Regulatory Compliance Hypothesis Results

The last hypothesis in the testing process refers to the moderating effect of COSO13 in the correlation between regulatory compliance violations and the associated penalties in the stock returns. The bootstrapping results are presented in panel D of Table 4. As illustrated in Panel D of Table 4, regressed coefficients in both of the observed horizons (three- and eight-day) lack statistical significance ($p\text{-values}>.05$). The absent statistical significance also includes the moderator and interacting term. This finding evidence that reputational penalties from failures to comply with regulators remain invariant with the new guidance. A plausible justification could be associated with the strengthened regulatory sanctioning mechanism from the financial crisis of 2008. Authorities in charge of oversight securities' market reinforced and implemented higher regulatory efforts during the observed sample timeframe 2008–2018, increasing the compliance complexities for firms and, therefore, their investors (Hughes, Wood, and Hodgdon, 2011; Katz, 2009).

Overall Findings

The main research hypothesis stands for the attenuation effect as consequence of the latest COSO framework on explaining stock returns penalties and corporate violations to the three pillars of the internal controls (operational safety, financial statements quality, and regulatory compliance). Using a methodological approach based on the bootstrapping methodology, Preacher, and Hayes (2004) argue that moderation exists when the interaction term between the moderator and the explanatory variable has statistically significant values. Significant values in such interacting variable are found in *ViolationXCOSO13*, *QualityXCOSO13*, and *FSQXCOSO13* in the three-day horizon. Interaction terms in the eight-day window were not significant across the studied models and *RegCompXCOSO13* (in both models). With such indicators, although the main hypothesis can be fully supported for the three-day window, only H1.a and H1.b has full support based on the used statistical methods and collected date. This supports that the new updated version of the Internal Controls-Integrated Framework (COSO, 2013) principles indeed attenuate the returns penalties of companies who implement these principles but failed in their execution in terms of operational safety and financial statements quality. Regulatory compliance failures are not however attenuated by implementing this guidance.

Supplementary Analysis Results

The last segment of testing process corresponds to the supplementary analysis for enhancing the quality of these study findings. By applying a statistical bootstrapping technique, the moderating variable *COSO13* was replaced with two controlling variables for discarding type errors I and II. The moderators are violations one year prior the enactment of the guidance (2012: *Control12*) and one year after the issuance (2014: *Control14*). Test results indicate negative regressed coefficients ($\lambda<0$) between *Violation* (IV) and *CAR_{3,8}* (DV). The only horizon with statistically significant values is only in the three-day window ($p\text{-value}<.05$). The moderators *Control12* and *Control14* and the interaction terms lack of statistical power ($p\text{-value}>.05$). These results suggest that the internal control violations serve to explain the market value penalty regardless of the enactment issued by the COSO. However, the moderating effect of attenuated risks consequence of this guidance exists and is only present in the year 2013 (absent in 2012 or 2014). These results help to mitigate the likelihood of incurring in errors type I and II in this study, and therefore, this supplementary analysis enhances the quality of the findings. [See Table 5, pg. 483]

Conclusion

Based on the collected data, and the applied bootstrapping statistical techniques, this study resolves that the updated enactment of the Internal Controls-Integrated Framework (COSO, 2013) has an attenuation effect on the asymmetric risks between owners and firms. This fact is observed by the influence of the new guidance in contributing to lesser the capital market penalties associated to corporate violations in operational safety and financial statements quality (excluding the third pillar -regulatory compliance). This result suggests that the new provisions contained in such framework promote healthier organizations stability with higher levels of proper documentation and more inclusive control of environments. Which means, organizations, as consequence of the implementation of these practices, have lower levels of asymmetric risk to shareholders when they fail in the internal controls' execution. These findings suggest a major and secondary contribution to the regulatory enforcement academic literature streams.

This study main findings offers a major contribution with respect to the influence of regulators over the market response. Regulators' interventions, in general, successfully promote markets competition fairness and safer practices in organizations. Academia offers however justified criticism regarding the over regulatory interventions (Arnold, Benford, Canada, & Sutton, 2011). Promoters of lower intervention levels have found unjustified expensive bureaucratic costs detrimental in firms' performance and shareholders (e.g., Nalukenge, Nkundabanyanga, and Ntayi, 2018). This study suggests that even though compliance costs are associated with lower profitability, regulations promoting safer business practices (like COSO 2013 Internal Controls-Integrated Framework) can be highly justified by lowering the market penalties when controlling systems fail. This position is mainly because of lower execution risk and asymmetric levels between companies and owners.

The secondary contribution relies on this study methodological approach. Results however are narrowed only to the study of the three-day window (not applicable for the eight-day cumulative abnormal return horizon). This contribution suggests that penalties, despite moderated by the new Internal Controls-Integrated Framework (COSO, 2013), are not sustained after a brief period of time. For shareholders and organizations this information becomes relevant because of the complexity levels arising from potential dilution effect (and noise) in the following days after the violation. Findings suggests instead that the study of market reactions to corporate violations of the Internal Control-Integrated Framework issued by COSO (2013) should be study in a brief time horizon lower than an eight-day window.

Although several statistical procedures mentioned above center COSO, 2013 as the principal inducement for attenuation of securities' reputational penalties, there is a possibility that this guidance may not be the only explanatory factor. In 2013, the same year of the internal controls framework implementation, academic evidence argues an inflection point for overcoming the fiscal crisis that occurred in 2008 (Berkowitz et al., 2015; Milanovic, 2020). Although this evidence also could be a possible explanatory scenario, this study poses the effects of the COSO, 2013 Internal Controls-Integrated Framework, the main inducement for the reasons described above.

Lastly, this study contains several controlled limitations. The most important relies on the used controls variables followed by selecting the three-day time horizon. The control variables measurement of firms' and industry's performance are annually rather than quarterly. This decision was made because related literature argues that the annual cumulative effect is more pronounced than quarterly (Boyle, Lewis-Western, and Seidel, 2021). In terms of the studied time horizon, three- and eight-day window, the selection criteria also refer to academic literature using more than one period (MacKinlay, 1997). The findings of this study are limited only to these parameters. Variations may not provide consistent results.

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Tables

Table 1: Basic Descriptive Statistics—Study Variables

	N	CAR ₃		CAR ₈	
		M	SD	M	SD
<i>Quality</i>	164	-.007	.040	-.015	.050
<i>FSQ</i>	110	-.008	.065	-.015	.135
<i>RegComp</i>	96	-.005	.046	-.025	.081
<i>COSO before 2013</i>	190	-.009	.054	-.026	.104
<i>COSO after 2013</i>	180	-.006	.045	-.008	.073
<i>Violation</i>	370	-.007	.050	-.017	.091

This table presents the number of collected firms with corporate violations before and after the updated enactment by the COSO. In addition, this table includes means (M) and standard deviations (SD) in the two observed horizons.

Table 2: Key Descriptive Statistics—Overall Variables

	M	MEDIAN	SD	Q ₁	Q ₂	Q ₃
<i>CAR₃</i>	-.007	-.002	.050	-.019	-.002	.019
<i>CAR₈</i>	-.017	.015	.091	-.022	-.015	.057
Assets (usd millions)	187,134	21,977	454,746	3,712	21,977	121,347
NI (usd millions)	3,618	864	7,870	34	864	3,907
ΔNI (usd millions)	163	11	7923	-284	11	475
ΔTA (usd millions)	-2,195	20	39,661	-1,360	20	1,440
ROE (percentage)	.102	.106	1.399	.046	.106	.177
ROA (percentage)	.025	.040	.197	.008	.040	.082
TobinsQ	1.187	1.036	.859	.682	1.036	1.399
ΔTA _{IND} (usd millions)	98.9	110.9	31.3	87.0	110.9	114.5
ΔNI _{IND} (usd millions)	4.9	12.7	17.7	-2.5	12.7	20.1
ROE _{IND}	.162	.168	.018	.154	.168	.177

This table presents the dependent and control variables basic statistics (mean and standard) and their quartile dispersions.

Table 3: Correlation Coefficients—Pearson’s and Spearman’s Methodology

	1	2	3	4	5	6	7	8	9
<i>CAR₃</i>	--	.465**	-.148**	.014	-.013	-.042	.057	-.013	-.030
<i>CAR₈</i>	.412**	--	-.097	-.060	-.026	-.015	.053	-.074	-.078
<i>COSO13</i>	-.112*	-.118*	--	-.051	.306**	-.114*	-.222**	.017	-.090
<i>Violation</i>	.033	-.079	-.051	--	-.047	-.034	-.030	-.021	-.025
<i>Quality</i>	.006	-.024	.306**	-.047	--	-.583**	-.523**	-.194**	.114*
<i>FSQ</i>	-.064	-.043	-.114*	-.034	-.583**	--	-.381**	.347**	-.039
<i>RegComp</i>	.056	.082	-.222**	-.030	-.523**	-.381**	--	-.141**	-.086
<i>Assets</i>	.019	-.079	.089	-.085	.118*	-.020	-.103*	--	.279**
<i>NI</i>	.116*	-.003	-.019	-.071	.246**	-.216**	-.046	.748**	--
<i>ΔNI</i>	.022	.027	-.058	-.029	.026	.000	-.027	.143**	.355**
<i>ΔTA</i>	.030	.028	-.156**	-.021	-.081	-.051	.148**	-.033	.111*
<i>ROE</i>	.087	.054	-.154**	-.086	.113*	-.195**	.086	.131*	.533**
<i>ROA</i>	.082	.044	-.142**	-.088	.221**	-.331**	.107*	.034	.494**
<i>TobinsQ</i>	.047	.068	.112*	-.051	.479**	-.507**	-.008	-.275**	.104*
<i>ΔTA_{IND}</i>	-.060	-.035	-.247**	-.087	.086	-.123*	.041	.159**	.221**
<i>ΔNI_{IND}</i>	.011	.018	-.026	-.067	-.112*	.005	.130*	.083	.057
<i>ROE_{IND}</i>	.019	-.032	-.032	-.087	.286**	-.265**	-.037	.102	.226**

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	10	11	12	13	14	15	16	17
<i>CAR₃</i>	-.100	.010	-.009	.023	.056	-.108*	.023	-.044
<i>CAR₈</i>	-.126*	.129*	.032	-.176**	.133*	-.107*	.022	-.070
<i>COSO13</i>	-.107*	.032	-.073	-.085	.143**	.110*	-.218**	-.115*
<i>Violations</i>	-.001	.003	-.047	-.162**	-.033	-.182**	-.071	-.096
<i>Quality</i>	-.038	.040	-.018	.051	.321**	.183**	-.116*	.264**
<i>FSQ</i>	.070	-.130*	.025	-.111*	-.285**	-.173**	.007	-.266**
<i>RegComp</i>	-.030	.091	.000	.078	-.063	-.005	.134**	-.011
<i>Assets</i>	-.021	-.186**	-.008	-.011	-.249**	.076	.074	.007
<i>NI</i>	.716**	.269**	.116*	.245**	-.063	.101	.086	.105*
<i>ΔNI</i>	--	.159**	.120*	.199**	-.015	-.017	.063	-.054
<i>ΔTA</i>	.085	--	.020	.030	.067	.040	.136**	.101
<i>ROE</i>	.339**	.198**	--	.319**	-.107*	-.125*	-.040	-.030
<i>ROA</i>	.336**	.226**	.863**	--	-.179**	.099	.017	.077
<i>TobinsQ</i>	.101	.143**	.376**	.554**	--	.158**	-.030	.099
<i>ΔTA_{IND}</i>	.132*	.115*	.123*	.165**	.168**	--	.185**	.413**
<i>ΔNI_{IND}</i>	.018	.135**	.033	.001	-.058	.050	--	.532**
<i>ROE_{IND}</i>	-.007	.030	.173**	.208**	.219**	.124*	.301**	--

Spearman's correlations results represent the lower diagonal. Pearson's correlations values are on the top diagonal. **. Correlation is significant at the .01 level (2-tailed). *. Correlation is significant at the .05 level (2-tailed).

Table 4: Moderation Test Results
Panel A: Returns, Violation and *COSO13*

Variables	1			2			3			4		
	CAR ₃	SE	P-value	CAR ₈	SE	P-value	CAR ₃	SE	P-value	CAR ₈	SE	P-value
<i>Intercept</i>	.006	.004	.090	.026	.006	.000	.016	.021	.450	.063	.036	.083
<i>Violation</i>	-.009	.006	.106	-.019	.009	.054	-.010	.006	.086	-.024	.010	.016
<i>COSO13</i>	-.015	.005	.005	-.018	.009	.045	-.017	.005	.001	-.025	.009	.007
<i>ViolationXCOSO13 (H1)</i>	.011	.008	.146	.017	.014	.204	.012	.008	.112	.022	.013	.101
Assets							.000	.000	.910	.000	.000	.442
NI							.000	.000	.604	.000	.000	.583
Δ NI							.000	.000	.020	.000	.000	.016
Δ TA							.000	.000	.026	.000	.000	.001
ROE							.000	.000	.958	-.001	.000	.091
ROA							.027	.012	.030	-.037	.021	.086
TobinsQ							.005	.002	.035	.011	.004	.003
Δ TA _{IND}							.000	.000	.556	.000	.000	.567
Δ NI _{IND}							.000	.000	.573	.000	.000	.451
ROE _{IND}							-.066	.138	.633	-.235	.236	.321
R^2	.014			.009			.046			.070		
F	3.157		.024	2.201		.087	2.423		.003	3.799		.000

Panel B: Returns, Quality, and *COSO13*

Variables	1			2			3			4		
	CAR ₃	SE	P-value	CAR ₈	SE	P-value	CAR ₃	SE	P-value	CAR ₈	SE	P-value
<i>Intercept</i>	.007	.004	.090	.030	.008	.000	.013	.021	.543	.055	.037	.133
<i>Quality</i>	-.004	.007	.455	-.014	.014	.341	.001	.008	.921	-.004	.014	.782
<i>COSO13</i>	-.022	.007	.003	-.030	.013	.025	-.012	.005	.009	-.018	.008	.025
<i>QualityXCOSO13 (H1.a)</i>	.014	.011	.044	.028	.020	.168	.001	.010	.950	.009	.017	.593
Assets							.000	.000	.868	.000	.000	.514
NI							.000	.000	.582	.000	.000	.420
Δ NI							.000	.000	.026	.000	.000	.015
Δ TA							.000	.000	.035	.000	.000	.001
ROE							.000	.000	.928	-.001	.000	.091
ROA							.028	.012	.025	-.036	.021	.091
TobinsQ							.005	.002	.035	.011	.004	.003
Δ TA _{IND}							.000	.000	.516	.000	.000	.562
Δ NI _{IND}							.000	.000	.611	.000	.000	.416
ROE _{IND}							-.072	.141	.610	-.249	.241	.302
R^2	.028			.015			.041			.062		
F	3.440		.017	1.795		.148	2.171		.010	3.350		.000

Panel C: Returns, Financial Statements Quality, and *COSO13*

Variables	1			2			3			4		
	CAR ₃	SE	P-value	CAR ₈	SE	P-value	CAR ₃	SE	P-value	CAR ₈	SE	P-value
<i>Intercept</i>	.006	.004	.181	.021	.008	.012	.009	.022	.682	.037	.037	.322
<i>FSQ</i>	-.001	.008	.049	-.015	.014	.928	.008	.007	.281	.031	.013	.016
<i>COSO13</i>	-.011	.006	.671	-.005	.011	.083	-.009	.004	.038	-.008	.008	.310
<i>FSQXCOSO13 (H1.b)</i>	.017	.011	.028	.046	.021	.148	-.017	.011	.114	-.046	.019	.014
Assets							.000	.000	.846	.000	.000	.383
NI							.000	.000	.502	.000	.000	.297
ΔNI							.000	.000	.018	.000	.000	.006
ΔTA							.000	.000	.034	.000	.000	.001
ROE							.000	.000	.970	-.001	.000	.099
ROA							.026	.013	.036	-.039	.021	.070
TobinsQ							.004	.002	.039	.011	.004	.003
ΔTA _{IND}							.000	.000	.714	.000	.000	.874
ΔNI _{IND}							.000	.000	.627	.000	.000	.415
ROE _{IND}							-.069	.139	.623	-.211	.239	.377
<i>R</i> ²	.031			.023			.045			.072		
<i>F</i>	3.907		0.009	2.879		0.036	2.369		.004	3.935		.000

Panel D: Returns, Regulatory Compliance, and *COSO13*

Variables	1			2			3			4		
	CAR ₃	SE	P-value	CAR ₈	SE	P-value	CAR ₃	SE	P-value	CAR ₈	SE	P-value
<i>Intercept</i>	.005	.005	.234	.026	.008	.002	.011	.021	.615	.047	.037	.194
<i>RegComp</i>	.003	.008	.740	.000	.013	.978	.006	.007	.381	.009	.012	.446
<i>COSO13</i>	-.015	.006	.165	-.020	.011	.065	-.011	.004	.014	-.015	.007	.044
<i>RegCompXCOSO13 (H1.c)</i>	.001	.013	.933	.018	.023	.433	-.006	.012	.634	.005	.021	.805
Assets							.000	.000	.850	.000	.000	.530
NI							.000	.000	.497	.000	.000	.392
ΔNI							.000	.000	.019	.000	.000	.014
ΔTA							.000	.000	.037	.000	.000	.002
ROE							.000	.000	.937	-.001	.000	.090
ROA							.027	.012	.029	-.037	.021	.080
TobinsQ							.005	.002	.031	.011	.004	.002
ΔTA _{IND}							.000	.000	.524	.000	.000	.464
ΔNI _{IND}							.000	.000	.570	.000	.000	.530
ROE _{IND}							-.067	.140	.634	-.207	.240	.389
<i>R</i> ²	.022			.012			.042			.064		
<i>F</i>	2.817		.039	1.4859		.218	2.228		.007	3.427		.000

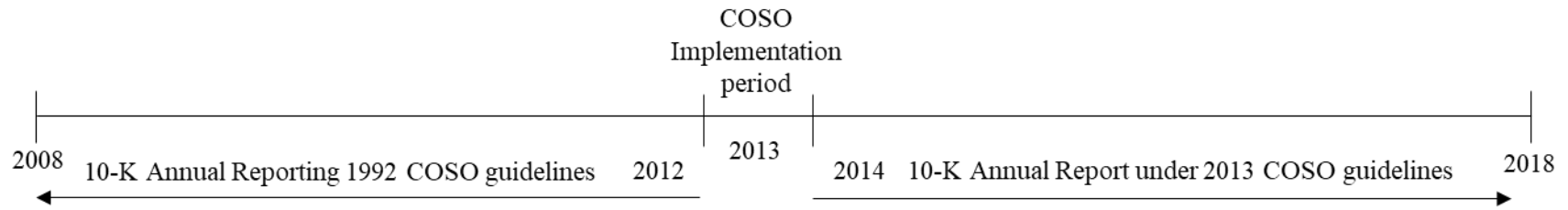
Bold numbers are statistically significant with p-values<.05. Table 4 displays moderating tests results applying the bootstrapping methodology referred in Hayes (2012) for the CAR values in the three- and eight-day window. The variables list in each panel includes the observe violations, the moderator, and their interacting term. Control regressed results derived from covariate them with the dependent, independent, and moderating variables.

Table 5: Supplementary Analysis Results

Variables	1			2			3			4		
	CAR ₃	SE	P-value	CAR ₈	SE	P-value	CAR ₃	SE	P-value	CAR ₈	SE	P-value
<i>Intercept</i>	.001	.003	.678	.021	.005	.000	.000	.004	.923	.020	.007	.002
<i>Violation</i>	-.009	.005	.050	-.016	.008	.084	-.006	.005	.048	-.014	.009	.135
<i>Control12</i>	-.010	.006	.115	-.013	.011	.210						
<i>Control14</i>							-.001	.005	.802	-.005	.009	.556
<i>ViolationXControl12</i>	.020	.009	.099	.022	.016	.172						
<i>ViolationXControl14</i>							.004	.008	.632	.006	.014	.651
<i>R²</i>	.008			.007			.002			.004		
<i>F</i>	1.947		.120	1.542		.202	.427		.734	.969		.407

This table presents the supplementary analysis test results where instead of using the variable *COSO13* as moderator, the moderating variables are *Control12* and *Control14*. The independent variable represents the internal control-integrated framework violation. The dependent variables are the *CAR₃* and *CAR₈* that measure the market value of the returns.

Figure 1: Timeline of COSO implementation



This figure presents the Internal Controls-Integrated Framework environments. The 1992 COSO guidelines applicability is observed in firms annual reporting until the year 2012. Then, firms initiated in 2013 the implementation of the new framework. After the year 2014, observed firms presented in their annual the adherence to the latest version.

