The Effect of KAMs Disclosure in the Extended Audit Report on Managerial Bad News Hoarding Behavior and Stock Price Crash Risk: The Role of Audit Firm Characteristics

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Abstract

This study aims to develop an understanding of the role of the extended audit report in mitigating managerial opportunistic behavior. Hence, this study examines the significance of Key Audit Matters (KAMs) disclosure in the rise of managerial bad news hoarding behavior, by decreasing the likelihood of stock price crashes. It also investigates the role of different aspects of audit firm characteristics in promoting the role of KMAs disclosure. This is achieved through examining the role of audit firm size, auditor industry specialization and audit tenure. The inferences are based on FTSE-193 firms with a total of 559 firm-year observations. The results reveal that the Big4 and industry-specialized audit firms, which disclose about KAMs in the previous year, have a negative impact on managerial bad news hoarding behavior, by decreasing the likelihood of stock price crash risk in the current year. Additionally, the findings suggest that KAMs disclosure is potentially compromised when an auditor has long audit tenure. These results are robust to additional controls and alternative measures. Overall, these results highlight the need for examining the information processing effect of KAMs disclosure and its role in controlling managerial opportunistic behavior.

Keywords

1. Introduction

There is a historical expectation gap between what users of financial statements expect from auditors and what auditors present in the audit report. The conventional audit report could increase the audit expectation gap since users perceive audit reports as a limited source of valuable information (Church et al, 2008). These claims have been strongly contested in recent years by users of financial statements. Therefore, the conventional audit report has been subjected to considerable criticism due to this expectation gap. However, the gap could be eliminated if auditors disclose in audit report key matters to users (Vanstraelen et al., 2012). Thus, the International Auditing and Assurance Standard Board (IAASB, 2015) releases a new auditing standard of the International Standard on Auditing (ISA) no. (701) "*Communicating Key Audit Matters in the Independent Auditor's Report*". This standard involves the new requirement of including key audit matters (hereafter, KAMs) in the audit report providing a considerable opportunity to advance the information value and usefulness of the audit reports. The auditor should bear in mind that the KAMs require to disclose areas of material misstatement and auditors' opinions regarding managers' judgements and material transactions during the audited period (IAASB, 2015b).

Various regulatory and professional institutions (e.g., IAASB, FRC, PCAOB, EU and IOSCO) have introduced and developed auditing standards to date, to encourage auditors to disclose KAMs in the audit report. The main reason for such developments is that the audit report is considered a significant component in the auditing process, by providing stakeholders with information about the truth and fairness in all material aspects of financial statements. For instance, in 2013, the Financial Reporting Council (FRC) in the UK issues ISA no. (700) which requires auditors to disclose about KAMs of firms that are under the UK governance code (FRC, 2013). In 2015, the IAASB releases a new auditing standard: ISA no. (701) with the new requirement of comprising KAMs in audit reports (IAASB, 2015b). In a similar case in the USA, the Public Company Accounting Oversight Board (PCAOB) in 2017 identifies Critical Audit Matters (CAMs) in the PCAOB's standard no. (AS3101) (PCAOB, 2017). In 2016, China Audit Standards Board (CASB) releases auditing standard no. (1504) *"Communicating Critical Audit Matters in Audit Reports"* to be implemented starting from January 2018. (Chen et al., 2017; Florou et al., 2022). Given the prior discussion, it may suppose the issue of the new requirement of incorporating KAMs in audit reports has received considerable critical attention in other jurisdictions.

The main purpose of auditing is to develop an insight into the financial reporting structure to express an independent opinion, on whether financial statements in all material aspects are prepared following generally accepted accounting principles (GAAP). In addition, the purpose of introducing and developing new auditing standards is to decrease the expectation gap between auditors and users of financial statements. Consequently, KAMs disclosure offers an effective way of increasing investors`

confidence in financial statements. However, this issue has grown in importance considering the main implications of the auditor-client relationship. The effectiveness of management may vary in light of the main determinants of the auditor-client relationship. Much of the current literature on the auditor-client relationship pays particular attention to managerial opportunistic behavior and agency problems (Xie et al., 2003; Vitolla et al., 2020).

Central to the entire discipline of agency problem is the concept of managerial opportunistic behavior. Incentives of compensation contacts and career security are the main drivers of managerial opportunistic behavior. Managers use different approaches to make up firm performance. For instance, using accruals manipulation, real earrings management, classification shifting and bad news hoarding (Baginski et al., 2018).

Over the past few decades, the stock market has realized fluctuations and downturns in stock prices. Hutton et al. (2009) discuss the reasons for such stock price fluctuations and crashes. One of the main explanations was firm-specific bad news hoarding behavior. These price crashes are almost certainly due to the managerial tendency to hoard firm-specific bad news from investors. A main implication of the bad news hoarding behavior is the possibility that stock price crash. Therefore, to observe managerial opportunistic behavior and to capture its impact on the stock price, it is more appropriate to use an analysis of a market-based approach such as bad news hoarding behavior (Baginski et al., 2018; Bao et al., 2019). It is crucial to investigate stock price crash risk to reduce investors` lack of confidence and their concerns about future stock price crashes. As a result of the investor's lack of confidence, investors demand a higher risk premium for expected price crash risk (Santa-Clara and Yan 2010). It is noteworthy to examine stock price crash risk for maintaining a stable economy and stock markets (Bollerslev and Todorov, 2011).

Much of the current literature on managerial bad news hoarding behavior has reported analyses of trends in stock price crash risk. Some scholars demonstrate that more transparency and comparability within financial statements could mitigate managerial ability in hoarding bad news and eventually decreases stock price crash risk (Hutton et al., 2009; Kim et al., 2016). Furthermore, Kim et al. (2018) document that more financial reporting transparency reduces the likelihood of future crashes. Other studies find a positive link between the CFO option portfolios and realized crash risk (Kim et al., 2011).

Considerable uncertainty still exists between the auditor-client relationship and managerial opportunistic behavior. This paper addresses a possible explanation for the impact of KAMs disclosure on managerial bad news hoarding behavior, that KAMs disclosure might provide investors with information about areas of material misstatement, in which KAMs have the possible channel to influence managerial bad news hoarding behavior (Porumb et al., 2021). Another possible explanation is that

KAMs disclosure requires auditors to increase audit scope and audit processes, thus increasing the possibility of monitoring any managerial opportunistic behavior.

It has conclusively been shown that audit firm characteristics have an impact on the auditing process. Prior literature provides evidence that audit firm characteristics (i.e., audit firm size, audit industry specialization, audit fees and audit tenure) have a role in mitigating managerial opportunistic behavior and stock price crash risk. Jiang and Yi (2013) find that the stock price crash risk reduces when auditors are industry-specialist. Habib and Hasan (2016) show a lessening in non-audit fees is significantly related to the limitation on stock price crash risk. Additionally, Callen and Fang (2017) demonstrate a negative relationship between audit tenure and stock price crash risk. However, the relationship between KAMs disclosure and managerial bad news hoarding behavior is inconclusive. This study examines the significance of KAMs disclosure in the rise of managerial bad news hoarding behavior and investigates how it relates to stock price crash risk. This distinction is further exemplified by exploring the effect of different aspects of audit firm characteristics on promoting KAMs role in mitigating managerial opportunistic behavior.

This study contributes to the literature in the following ways. First, this investigation is among the first attempts to explore the effect of KAMs disclosure on managerial bad news hoarding behavior, and the underlying consequences from the perspective of stock price crash risk. As a main implication of the bad news hoarding behavior is the possibility that stock price crash (Baginski *et al.* 2018; Bao et al. 2019). Several attempts have been made to examine the information processing effect of KAMs disclosure (Segal, 2017; Ismail et al., 2018). However, neither of them empirically investigates the implications of KAMs disclosure on bad news hoarding behavior. Furthermore, prior literature shows that managers hoard bad news to make up for firm performance. Therefore, understanding managerial behavior also carried broad implications for the stability of financial markets and the global economy (Blanchard 2009; Bollerslev and Todorov 2011). Consequently, this study enriches the literature in the field of managerial behavior and market reaction to KAMs disclosure and sheds light on the role of KAMs disclosure in mitigating managerial opportunistic behavior. Second, research on the disclosure of KAMs within audit report are mainly concerned with the experimental approach (Christensen et al. 2014; Gimbar et al. 2016; Brasel et al. 2016), while others use archival data (Bédard et al. 2019; Reid et al. 2019). Nevertheless, this study provides evidence from behavior and market-based approaches. Third, the analysis further investigates the role of different aspects of audit firm characteristics (i.e., audit firm size, auditor industry specialization, and audit tenure) in shaping the relationship between KAMs disclosure and managerial bad news hoarding behavior. Fourth, the disclosure of KAMs taken in academic research reflects mixed results based on their usefulness in decreasing the gap between auditors and users of financial statements. Thus, this study provides evidence to one stream of prior literature.

The paper proceeds as the following structure: Section 2 provides the literature review and develops research hypotheses. Section 3 defines variables, and provides descriptive statistics for the full sample and section 4 develops empirical models. Section 5 provides empirical results, section 6 provides robustness tests, and section 7 discusses the main results.

2. Prior Literature and Hypotheses Development

2.1. Regulatory Developments Background

The new requirements of KAMs disclosure have been issued to enhance the information value of audit reports and activate communication between auditors and users of financial statements (Church et al, 2008; Mock et al, 2013). In response to the importance of the audit report, the IAASB revises ISA no. (700) and releases a new auditing standard of ISA no. (701) "*Communicating Key Audit Matters in the Independent Auditor's Report*", which was effective on December 15th, 2016. Hence, these changes have made a significant effect on communicating KAMs in the audit report and reducing the expectation gap between auditors and users of financial statements. Based on the prior discussion, it may suppose the issue of the new requirement of incorporating KAMs in audit reports has received considerable critical attention, in other jurisdictions issued by different regulatory, professional and international organizations (e.g., FRC, PCAOB, EU and IOSCO). There are similarities between the new requirements of KAMs disclosure expressed by different jurisdictions (Dogan and Arefaine, 2017). For instance, in a similar case in the USA, the PCAOB in 2017 issued a new standard of reporting Critical Audit Matters (CAMs) to reveal material misstatements in the audit report (PCAOB, 2017).

It would be insightful to compare experiences of issuing new audit releases within their impact on the auditing process and audit quality. Whereas some new standard provides a limited framework to guide auditors during the implementation of these new requirements. For instance, some auditors have confusion about meeting the requirements of KAMs disclosure, then consequently they could not achieve the ultimate objective of the standard. Auditors tend to be more concerned with the proper choice of KAMs and subsequently they may lose achieving the main objective of the standard (Dogan and Arefaine, 2017). Moreover, some auditors may interpret new auditing releases in contrast to another auditing standard. For instance, two divergent and often conflicting discourses emerged from ISA no. (706) Emphasis of Matter (EOM) and ISA no. (570) Going Concern (GC). When the auditor reports about KAMs the reporting about EOM and GC would be limited. Although any material uncertainty is considered a part of KAMs, the IAASB obligates to report it as a part of GC. Such treatments increase auditors' confusion about how KAMs and GC overlapped (Silviu and Timea, 2015). Moreover, in the groundbreaking analysis of ISA no. (570), ISA no.

(706) and ISA no. (701); the Association of Chartered Certified Accountants (ACCA) (2018) reveals that auditors have a limited understanding of the overlapping between GC, EOM and KAMs. This overlapping has recently been challenged by Gold and Heilmann (2019) who find that auditors have some confusion in classifying an audit matter as a part of GC, EOM or KAMs.

2.2. KAMs Disclosure in Extended Audit Report

The conventional audit report has been subjected to considerable criticism due to its limitations as a source of valuable information to the users of financial statements (Church et al., 2008). Therefore, the IAASB releases a new requirement of including KAMs in the audit report (IAASB, 2015b). However, the disclosure of KAMs taken in academic research reflects mixed results based on its usefulness in decreasing the gap between auditors and users of financial statements. Christensen et al. (2014) find the reaction of non-professional users changes significantly in the response to the disclosure of KAMs. Kohler et al. (2016) provide evidence that professional investors have a positive perception of firms with KAMs disclosure than those firms without KAMs disclosure. Smith (2019) finds that KAMs disclosure enhances investors` readability of the audit report and increases investors` ability in risk assessment. Coram and Wany (2020) provide evidence that KAMs disclosure has a significant role in decreasing the expectation gap compared to post ISA no. (701).

KAMs disclosure is an important component in the audit report and plays a key role in increasing financial reporting quality. Porumb et al. (2021) demonstrate the usefulness of KAMs disclosure in credit contracting. Creditors use such disclosure in the process of credit risk evaluation. Other studies by Li et al. (2019) and Reid et al. (2019) support the significant role of KAMs disclosure in enhancing audit quality. In addition, Doxey (2014) finds KAMs disclosure decreases the likelihood of misstatement due to decreases information asymmetry between auditors and users of financial statements. The same conclusions are reached in the study of Reid et al. (2019) who demonstrate that KAMs disclosure in the audit report improves financial reporting quality by decreasing abnormal accruals. Sirois et al. (2018) find reporting about risk in the extended audit report through KAMs receives higher attention than those reported by management in the footnotes of financial statements. Wang et al. (2018) show evidence of the increasing content value of the audit report where KAMs are disclosed. However, this interpretation contrasts with others studies in terms of investor reaction and audit quality. Gutierrez et al. (2017) and Lennox et al. (2023) show no significant change in investors` reactions towards earnings announcements when KAMs are disclosed in audit reports.

2.3. Managerial Bad News Hoarding Behavior

Based on the agency theory; managers may engage in opportunistic behavior to maximize their benefits against the stakeholders` benefits. Managers have incentives to manipulate the real performance of firms through overstating earnings or understating risks. One of the managers` approaches to manipulating real performance is to hoard bad news announcements or to accelerate good news announcements (Miller and Skinner, 2015; Baginski et al., 2018). Prior studies provide evidence about managerial opportunistic behavior and bad news hoarding behavior (Hong et al., 2000). Tracy et al. (2021) find managerial bad news hoarding behavior increases with lower investors` attention and lower analysts' coverage. Bao et al. (2019) document that managers delay bad news announcements to achieve short-term interests. Prior scholars have discussed the managerial incentives behind bad news hoarding behavior. Managers hoard bad news announcements to avoid litigation costs (Callen and Fang, 2015) or to decrease litigation costs (Houston et al., 2019). In addition, Kim et al. (2011a) show that compensation, contracts, and career reputation are the main drivers for managers to hoard bad news. Baginski et al. (2018) document a link between managerial bad news hoarding behavior and maintaining career contracts.

After hoarding bad news reaches a certain threshold, the stock price crashes causing a significant loss in stock returns. The stock price crash risk is the probability of making significant negative stock returns in a specific period (Hutton et al. 2009; Kim and Lyon 2011, Chen et al., 2017). The research to date has tended to find a possible explanation for the link between bad news hoarding behavior and stock price crash risk. This correlation could be explained by the theory of asymmetries in returns. This theory states that significant positive or negative movements in stock price lead investors to conduct a subjective assessment of market volatility, which would be reflected in higher risk premiums. Consequently, investors` subjective assessment would decrease equilibrium prices or increase negative returns. More specifically, if the case of hoarding bad news according to French et al. assumptions in 1987, bad news announcements will boost negative returns and increase negative skewness in returns distribution (Campbell and Hentschel, 1992). Nevertheless, there are other possible explanations for stock price crashes based on agency theory, which includes variations in investors` reactions, opinions, and lack of governance that could lead to stock prices crash. Hong and Stein (2003) exhibit evidence about variation in investors' opinions leads to extremely negative returns. In addition, an increasing level of information asymmetry between management and investors boosts the likelihood of a stock price crash. Cohen et al. (2014) find that weak governance and poor transparency increase management`s incentives to conceal bad news for a period until reaches a certain threshold, where the stock price crashes with significant negative returns.

Prior studies also investigated the impact of information content, readability, conservatism and comparability of financial reports on stock price crashes. Hutton et al. (2009) support the result of Jin and Myers (2006) that greater transparency is negatively associated with stock price crashes. Ertugrul et al. (2017) and Kim et al. (2018) show evidence that the probability of a stock price crash increases with decreasing the level of readability of financial reports. Moving to conservatism, the managerial behavior of hoarding bad news has limited alignment with the main objective of conservatism. The findings of Kim and Zhang (2016) support the previous discussion of conservatism and comparability, which are negatively linked to managerial bad news hoarding behavior and stock price crashes.

Collectively, these studies outline the critical role of KAMs disclosure in the audit report in shaping the quality of financial reports and market reaction. In addition to earlier findings, however, no evidence of KAMs disclosure was detected in influencing managerial opportunistic behavior of hoarding bad news. Therefore, this study contributes to prior literature in the field of managerial behavior and market reaction to KAMs disclosure and sheds light on the role of KAMs disclosure in mitigating managerial opportunistic behavior.

2.4. Hypotheses Development

Managers have incentives to maintain their compensation, contracts, and career reputation. They may engage in opportunistic behavior to maximize their benefits against the stakeholders` benefits (e.g., hoarding bad news announcements). Once accumulated bad news reaches certain thresholds, managers can no longer hoard bad news, then stock price crashes (Kothari et al., 2009; Hutton et al., 2009; Cohen et al., 2014). However, it has been suggested that KAMs disclosure is related to sophisticated audit work, in which KAMs disclosure requires empowering auditors and increasing their coverage to monitor managerial behavior. Therefore, KAMs disclosure reflects additional monitoring for managerial opportunistic behavior. Expectations have identified that KAMs disclosure in the previous year decreases managerial bad news hoarding behavior in the current year, thus the first hypothesis could be formulated as follows:

H_1: KAMs disclosure in the extended audit report relates negatively to managerial bad news hoarding behavior.

Prior studies have investigated different aspects of audit firm characteristics such as audit firm size (Bepari and Mollik, 2015), joint audit pairs (Lobo et al., 2017), auditor specialization (Chen et al., 2015), as well as audit fees and auditor tenure (Albersmann and Quick, 2020). Further investigation about the importance of different aspects of audit firm characteristics in mitigating managerial opportunistic behavior would map into the auditor-client relationship and thus influences the role of KAMs disclosure. For

instance, auditors' industry specialist increases auditor monitoring role over managerial opportunistic behavior. (Jiang and Yi, 2013; Robin and Zhang, 2014). Taken together, this suggests a function for different aspects of audit firm characteristics in promoting KAMs role in mitigating managerial bad news hoarding behavior, thus the second hypothesis could be formulated as follows:

H_2: The negative impact of KAMs disclosed in the extended audit report on managerial bad news hoarding behavior is greater with sound aspects of audit firm characteristics

This study uses audit firm size, auditor industry specialization, and audit tenure as proxies of audit firm characteristics. Prior literature provides evidence on how audit firm characteristics affect managerial opportunistic behavior and crash risk. Firms audited by Big4 and/or auditor industry specialized, are less likely to experience stock price crashes, because their quality with specialty knowledge within a certain industry enables them to detect and report managerial opportunistic behavior (Lang and Maffett, 2010; Robin and Zhang, 2014; Liang et al., 2020). In addition, auditors with long audit tenures tend to perform better in restricting managers to hoard bad news announcements. This study follows Callen and Fang (2017) who find a negative relationship between audit tenure and stock price crash risk, long audit tenure achieves a learning perspective to mitigate managerial opportunistic behavior. It is expected audit firms of Big4, auditor industry specialization and long audit tenure would increase the role of KAMs disclosure in mitigating managerial bad news hoarding behavior. Hence, the sub-hypotheses of the second one could be formulated as follows:

H_{2a}: The negative impact of KAMs disclosed in the extended audit report on managerial bad news hoarding behavior is greater with Big4.

H_{2b}: The negative impact of KAMs disclosed in the extended audit report on managerial bad news hoarding behavior is greater with auditor industry specialized.

H_{2c}: The negative impact of KAMs disclosed in the extended audit report on managerial bad news hoarding behavior is greater with long audit tenure.

In summary, this study focuses on the effect of KAMs disclosure on managerial opportunistic behavior (i.e., managerial bad news hoarding behavior). It is expected that KAMs disclosure in the previous year decreases managerial bad news hoarding behavior in the current year. This study examines this expectation by testing the first hypothesis. This distinction is further exemplified using different aspects of audit firm characteristics. It is expected that the role of KAMs disclosure in mitigating managerial bad news hoarding behavior could be increased by employing various aspects of audit firm characteristics. This expectation is examined by testing the second hypothesis.

3. Data and Methodology

3.1. Data and Sample Selection

The study is based on annual reports from when the requirements of KAMs disclosure of 2013 in the UK were starting to be enacted. The initial sample is comprised of the FTSE-350 index between 2014 and 2017. KAMs disclosure data as well as audit firm characteristics data are extracted from audit reports. This study, where necessary, is complemented with additional financial data and stock returns data are retrieved from the Bloomberg database. Firms with long audit report lag (more than one month), as well as observations with incomplete data, are excluded to minimize the effect of having an unbalanced panel data. In line with prior studies banking and non-banking financial insinuations are excluded from the sample, due to differences in regulation and presentation of their financial statements. Thus, this yields the total number of firm-year observations to 559 representing 193 firms.

Table (1) presents descriptive statistics about the final sample.

Table 1. Descriptive Statistics

VARIABLE	MEAN	STANDARD DEVIATION	P25	MEDIAN	P75
$DUVOL_{i,t}$	−.117	.529	−.447	−.119	.204
$KAMs_{i,t-1}$	0.041	0.199	0	0	0
$Big\ 4_{i,t-1}$	0.713	0.449	0	1	1
$Special_{i,t-1}$	0.361	0.479	0	0	1
$Tenure_{i,t-1}$	0.11	0.31	0	0	0
$Size_{i,t}$	8.006	1.419	7.07	7.8	8.64
$CG_{i,t}$	0.730	0.304	0.292	0.773	1.164
$Lev_{i,t}$	.174	.127	.072	.150	.245
$ROA_{i,t}$	0.179	0.306	0.07	0.15	0.23
$Ab.Acc_{i,t}$	0.633	1.575	0.110	0.259	0.571
$BM_{i,t}$	0.860	0.502	0.497	0.765	1.129

3.2. Measurement and Methodology

Measuring KAMs Disclosure

Recent developments in the extended audit report have heightened the need for developing a framework to measure KAMs disclosures and the level of disclosure. However, this study follows the prior literature of Reid et al. (2019) in measuring KAMs disclosure to determine whether auditors disclose it in the audit report or not. KAMs disclosure ($KAMs_{i,t-1}$) is nominal scale, takes 1 if a key audit matter is disclosed in the audit report of firm i in year t-1 and zero otherwise.

Measuring Managerial Bad News Hoarding Behavior

Various models have been introduced and developed to measure managerial bad news hoarding behavior. Jin and Myers (2006) use stock price crash risk as a proxy of managerial bad news hoarding behavior. The most three common measures of stock price crash risk are the negative coefficient of skewness, down-to-up volatility measure, and crash count measure1(e.g., Kim et al., 2011a, 2011b, 2014; Callen and Fang 2015; Kim and Zhang, 2016; Chen et al. 2017; Cao et al., 2019). Scholars of stock price crash risk have tended to focus on firm-specific risk rather than common market risk. The following expanded market model is developed based on weekly return data for each firm-year observation as shown in model (1):

$$r_{i,t} = \beta_{0,i} + \beta_{1,i} r_{m,t-2} + \beta_{2,i} r_{m,t-1} + \beta_{3,i} r_{m,t} + \beta_{4,i} r_{m,t+1} + \beta_{5,i} r_{m,t+2} + \varepsilon_{i,t} \qquad (1)$$

Where: $r_{i,t}$ is the return on stock i in week t, and $r_{m,t}$ is the value-weighted market return in week t. Following Kim et al. (2014) the firm-specific weekly return is calculated as the natural logarithm of one plus the residual return from the market model.

$$W_{i,t} = Log \ (1 + \varepsilon_{i,t}) \qquad (2)$$

The first proxy of stock price crash risk is the negative coefficient of skewness. Chen et al. (2001) develop a model to measure the negative coefficient of skewness of firm-specific weekly returns as shown in model (3).

$$NCSKEW_{i,t} = - \ \frac{n(n-1)^{3/2} \sum W_{i,t}^3}{(n-1)(n-2)(\sum W_{i,t}^2)^{3/2}} \qquad (3)$$

Where: $NCSKEW_{i,t}$ is the negative ratio of the third moment of firm-specific weekly return estimated from model (2) to its standard deviation raised to the third power for firm i in year t. Stocks are more likely to crash for firms with higher values of $NCSKEW_{i,t}$.

The second proxy of stock price crash risk is the down-to-up volatility measure. To calculate the probability of a stock price crash; the mean of firm-specific weekly returns is calculated, and then all firm-specific weekly returns are split into two sub-samples below and above the mean (down sub-sample and up sub-sample). The standard deviation of firm-specific weekly returns for each sub-sample is calculated. Eventually, to capture the likelihood of a stock price crash, the natural logarithm of the ratio of the standard deviation of the down sub-sample to the standard deviation of the up sub-sample is calculated as shown in model (4):

$$DUVOL_{i,t} = Log \left[\frac{(n_u-1)\sum_{down} W_{i,t}^2}{(n_d-1)\sum_{up} W_{i,t}^2} \right] \qquad (4)$$

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[1] This study uses down-to-up volatility model as a proxy of managerial bad news hoarding behavior for the main model and crash count model for the robustness test.

Where: $DUVOL_{i,t}$ the probability of stock price crash for firm i in year t, n_d and n_u are the total number of weeks when firms have stock returns under the mean and above the mean, respectively. Stocks are more likely to crash for firms with higher values of $DUVOL_{i,t}$ (Kim and Zhang, 2016; Kim et al., 2016).

The $Crash\_Count$ is the third proxy of stock price crash risk. The $Crash\_Count$ is based on the number of firm-specific weekly returns which exceeds 3.09 standard deviations above and below the mean firm-specific weekly return over the fiscal year. Eventually, to capture the probability of a stock price crash the $Crash\_Count$ calculated as the down sub-sample minus the up sub-sample as shown in the model (5) (Hutton et al., 2009; Callen and Fang, 2015):

$$Crash\_Count_{i,t} = \sum down\, W_{i,t} - \sum up\, W_{i,t} \qquad (5)$$

Measuring Audit Firm Characteristics

Audit firm characteristics are audit firm size, auditor industry specialization and audit tenure employed in this study. Audit firm size ($Big4_{i,t-1}$) is nominal scale takes 1 if the audit firm is Big4 and zero otherwise. Measuring auditor industry specialized ($Special_{i,t-1}$) as a nominal scale takes 1 if the auditor is industry specialized and zero otherwise (Robin and Zhang, 2014). Audit tenure ($Tenure_{i,t-1}$) is the length of time the audit has been the auditor of a client measured in years. It is a nominal scale that takes 1 when audit tenure is more than or equal to three years and zero otherwise (Boone et al., 2010; Callen and Fang, 2017).

Control Variables

Scholars of managerial opportunistic behavior and stock price crash risk (e.g., Hutton et al.,2009; Kim and Zhang, 2016; Chen et al., 2017) use a set of control variables, to isolate the effect of KAMs disclosure on managerial bad news hoarding behavior from the effect of other determinants of managerial opportunistic behavior. Following the literature, firm size ($Size_{i,t}$) and corporate governance $\left(CG_{i,t}\right)$ are controlled. Prior studies find that large and less governed firms are more likely to crash (Hutton et al., 2009; Bzeouich, 2019; Kim et al., 2019). Firm financial and operating performance are controlled using leverage $\left(Lev_{i,t}\right)$ and profitability ($ROA_{i,t}$). Firms with high leverage are more likely to experience stock price crashes and higher ROA leads to less crash risk (Van Buskirk, 2011; Kim et al., 2019). Table (2) provides definitions of the main variables used in this study.

Table 2. Variables Definition

VARIABLE	DEFINITION	MEASUREMENT
MODEL VARIABLE		
$DUVOL_{i,t}$	The probability of stock price crashes for firm i in year t	the natural logarithm of the ratio of the standard deviation of the down sub-sample to the standard deviation of the up sub-sample
$KAMs_{i,t-1}$	Key audit matter of firm i at year t-1	equals one if key audit matters are disclosed in the audit report, and zero otherwise.
$Big\ 4_{i,t-1}$	Audit firm size of firm i at year t-1	An indicator variable equal to 1 when the auditor is a member of the Big Four, and 0 otherwise;
$Special_{i,t-1}$	Auditor industry specialized of firm i at year t-1	An indicator variable equals 1 when firm i is an industry specialist client in year t, and zero otherwise
$Tenure_{i,t-1}$	Audit Tenure of firm i at year t-1	An indicator variable equals 1 when audit tenure is more than or equal to three years; 0 otherwise.
CONTROL VARIABLE		
$Size_{i,t}$	Firm size for firm i at year t	the natural logarithm of total assets
$Lev_{i,t}$	Leverage for firm i at year t	the ratio of total debt to equity
$ROA_{i,t}$	Returns on assets for firm i at year t	the percentage of net income to average total assets
$Ab.Acc_{i,t}$	Abnormal accrual for firm i at year t	the absolute value of discretionary accruals according to the modified Jones model
$CG_{i,t}$	corporate governance score for firm i at year t	measured as the corporate governance score at the fiscal year t

4. Empirical Model

This study examines the significance of KAMs disclosure in the rise of managerial bad news hoarding behavior and investigates how it relates to stock price crash risk. This distinction is further investigated by exploring the effect of different aspects of audit firm characteristics, in promoting KAMs role, in mitigating managerial bad news hoarding behavior. Following prior literature on the audit report through studying implications of KAMs disclosure (e.g., Christensen et al. 2014; Brasel, 2016; Reid et al., 2019; Zhou, 2019; Porumb et al., 2021), this study focuses on the effect of KAMs disclosure on managerial opportunistic behavior (i.e., managerial bad news hoarding behavior). It is expected that KAMs disclosure in the previous year decreases managerial bad news hoarding behavior, by decreasing the likelihood of a stock price crash in the current year. The following model has been developed to test the first hypothesis:

$$DUVOL_{i,t} = \beta_0 + \beta_1 KAMs_{i,t-1} + \beta_2 Size_{i,t} + \beta_3 CG_{i,t}$$

$$\beta_4 Lev_{i,t} + \beta_5 ROA_{i,t} + \varepsilon_{i,t} \ (6)$$

Where $DUVOL_{i,t}$ refers to stock price crash risk for firm i at the current year and $KAMs_{i,t-1}$ is dummy variable refers to whether the auditor discloses key audit matters in the previous year. Therefore, it is expected a negative and significant β_1 at model (6).

In addition, the distinction is further exemplified using different aspects of audit firm characteristics. Thus, this study goes further in investigating the role of audit firm characteristics. It is expected that the role of KAMs disclosure in mitigating managerial bad news hoarding behavior could be increased when employing the audit firm characteristics. This expectation is examined by testing the second hypothesis. More specifically to test H_{2a}, model (6) has been extended to capture the impact of audit firm size in promoting KAMs role:

$$DUVOL_{i,t} = \beta_0 + \beta_1 KAMs_{i,t-1} + \beta_2 Big4_{i,t-1} + \beta_3 KAMs_{i,t-1} * Big4_{i,t-1} + \beta_4 Size_{i,t} +$$
$$\beta_5 CG_{i,t} + \beta_6 Lev_{i,t} + \beta_7 ROA_{i,t} + \varepsilon_{i,t} \text{ (7)}$$

Where $Big4_{i,t-1}$ refers to the audit firm size for firm i in the previous year. Therefore, it is expected a negative and significant β_3 at model (7). Similarly, to test H_{2b}, model (7) has been modified to capture the impact of the auditor industry specialized in enhancing KAMs role in mitigating managerial bad news hoarding behavior.

$$DUVOL_{i,t} = \beta_0 + \beta_1 KAMs_{i,t-1} + \beta_2 Special_{i,t-1} + \beta_3 KAMs_{i,t-1} * Special_{i,t-1} + \beta_4 Size_{i,t} +$$
$$\beta_5 CG_{i,t} + \beta_6 Lev_{i,t} + \beta_7 ROA_{i,t} + \varepsilon_{i,t} \text{ (8)}$$

Where $Special_{i,t-1}$ refers to the auditor industry specialized for firm i in the previous year. Therefore, it is expected a negative and significant β_3 at model (8). In addition, to test H_{2c}, model (7) has been modified to capture the impact of audit tenure in increasing KAMs role in mitigating managerial bad news hoarding behavior.

$$DUVOL_{i,t} = \beta_0 + \beta_1 KAMs_{i,t-1} + \beta_2 Tenure_{i,t-1} + \beta_3 KAMs_{i,t-1} * Tenure_{i,t-1} + \beta_4 Size_{i,t} +$$
$$\beta_5 CG_{i,t} + \beta_6 Lev_{i,t} + \beta_7 ROA_{i,t} + \varepsilon_{i,t} \text{ (9)}$$

Where $Tenure_{i,t-1}$ refers to audit tenure for firm i in the previous year. Therefore, it is expected a negative and significant β_3 at model (9).

5. Empirical Results

This study aims to investigate the impact of KAMs disclosure in mitigating managerial bad news hoarding behavior and examines how it relates to stock price crash risk. Model (6) has been estimated and the results are presented in table (3). Results suggest that KAMs disclosure in the previous year is negatively associated with the managerial bad news hoarding behavior in the current year. The coefficient estimates of β_1, as expected, is negative and significant ($\beta_3 = -0.079$, $p < 0.05$).

Table 3. Empirical Results

DEPENDENT VARIABLE	$DUVOL_{i,t}$			
VARABILE	Model (6)	(7)	(8)	(9)
$KAMs_{i,t-1}$	-0.079** (0.037)	-0.013** (0.032)	-0.013* (0.076)	0.049* (0.003)
$Big4_{i,t-1}$		-0.011** (0.043)		
$KAMs_{i,t-1} * Big4_{i,t-1}$		-0.082** (0.040)		
$Special_{i,t-1}$			-0.009** (0.095)	
$KAMs_{i,t-1} * Special_{i,t-1}$			-0.178** (0.089)	
$Tenure_{i,t-1}$				0.009 (0.190)
$KAMs_{i,t-1} * Tenure_{i,t-1}$				0.182** (0.089)
$Size_{i,t}$	0.269*** (0.044)	0.247*** (0.041)	0.215*** (0.060)	0.172*** (0.051)
$CG_{i,t}$	-0.004 (0.351)	-0.007 (0.363)	-0.003 (0.388)	0.047 (0.133)
$Lev_{i,t}$	0.002 (0.002)	0.002 (0.002)	0.003* (0.002)	0.003 (0.002)
$ROA_{i,t}$	-0.165 (0.163)	-0.168 (0.165)	-0.222 (0.187)	-0.212 (0.184)
N	559			
ADJUSTED R^2	0.295	0.243	0.479	0.432

*, **, *** significance at the 0.10, 0.05, and 0.01 level (2-tailed) respectively.

In this set of analyses, additional evidence is provided concerning different aspects of audit firm characteristics to investigate their impact in promoting KAMs role in mitigating managerial bad news hoarding behavior. Models (7-9) have been estimated and the results are presented in table (3). The results are quite revealing in several ways. First, the interactive slope coefficient of ($KAMs_{i,t-1} * Big4_{i,t-1}$) β_3 in model (7), is negative and significant (β_3 = -0.082, p < 0.05) as expected. This confirms H_{2a} and implies that the presence of Big4 increases the role of KAMs disclosure in mitigating managerial bad news hoarding behavior. Second, the interactive slope coefficient of ($KAMs_{i,t-1} * Special_{i,t-1}$) β_3 in model 8, as expected, is negative however it is insignificant (β_3 = -0.178, p > 0.05). Third, the interactive slope coefficient of ($KAMs_{i,t-1} * Tenure_{i,t-1}$) β_3 in model 9, is positive and insignificant (β_3 = 0.182, p > 0.05). These results do not match the initial expectations. However, these findings have important implications for studying the role of audit industry specialization and audit tenure in promoting KAMs disclosure role. Control variables that are used to isolate the causality between KAMs disclosure and managerial bad news hoarding behavior have the expected signs. An exception is for only one variable which is corporate governance

(CG) which has a positive sign only within audit tenure investigation however it is insignificant

6. Robustness Checks

Additional checks are performed to test the robustness of the main results. Empirical evidence suggests that KAMs disclosed in audit report relates negatively to managerial bad news hoarding behavior. It is interesting to note that such an association can give rise to endogeneity problems between the main variables of this study. This heterogeneity may be due to unobservable firm-specific characteristics which may affect KAMs disclosure and managerial bad news hoarding behavior. In the empirical model to mitigate the causality effect, the previous year's KAMs disclosure regressed on the proxy of stock price crash risk of the current year to mitigate the causality effect. However, the heterogeneity problem may remain, due to limited considerable change in the opportunistic managerial behavior over years. Following Kim et al. (2014) the empirical models have been extended, by comprising additional variables to control the likelihood of causality between KAMs disclosure and managerial bad news hoarding behavior. Abnormal accrual $(Ab.Acc_{i,t})$ is considered an approach of managerial opportunistic behavior and has a prediction power over stock price crash risk (Chen et al. 2001; Hutton et al. 2009). In addition, Kim et al. (2014) control glamour stocks, by including book to market ratio $(BM_{i,t})$. Therefore, these control variables serve as a base for a robustness check for the main empirical model. Thus, model (6) has been extended as the following model:

$$DUVOL_{i,t} = \beta_0 + \beta_1 KAMs_{i,t-1} + \beta_2 Big4_{i,t-1} + \beta_3 KAMs_{i,t-1} * Big4_{i,t-1} + \beta_4 Size_{i,t} +$$
$$\beta_5 CG_{i,t} + \beta_6 Lev_{i,t} + \beta_7 ROA_{i,t} + \beta_8 Ab.Acc_{i,t} + \beta_9 BM_{i,t} + \varepsilon_{i,t} \ (10)$$

$$DUVOL_{i,t} = \beta_0 + \beta_1 KAMs_{i,t-1} + \beta_2 Special_{i,t-1} + \beta_3 KAMs_{i,t-1} * Special_{i,t-1} + \beta_4 Size_{i,t} +$$
$$\beta_5 CG_{i,t} + \beta_6 Lev_{i,t} + \beta_7 ROA_{i,t} + \beta_8 Ab.Acc_{i,t} + \beta_9 BM_{i,t} + \varepsilon_{i,t} \ (11)$$

$$DUVOL_{i,t} = \beta_0 + \beta_1 KAMs_{i,t-1} + \beta_2 Tenure_{i,t-1} + \beta_3 KAMs_{i,t-1} * Tenure_{i,t-1} + \beta_4 Size_{i,t} +$$
$$\beta_5 CG_{i,t} + \beta_6 Lev_{i,t} + \beta_7 ROA_{i,t} + \beta_8 Ab.Acc_{i,t} + \beta_9 BM_{i,t} + \varepsilon_{i,t} \ (12)$$

Table (4) reports the results of the robustness check for models (10-12). Panel (A) shows the β_3 in model (10) remains consistently negative and significant (β_3 = -0.133, p < 0.05). Accordingly, the robustness of model (10) is confirmed. Surprisingly, after controlling the likelihood of causality between KAMs disclosure and managerial bad news hoarding behavior, through controlling abnormal accrual and book-to-market ratio

the β_3 in model (11) turns out to be significant (β_3 = -0.184, p < 0.05), also in model (12) (β_3 = 0.243, p < 0.05), but with a positive sign. In addition, to check the robustness of our main results the $Crash\_Count$ is used as an alternative measure of stock price crash risk.

$$Crash\_Count_{i,t} = \beta_0 + \beta_1 KAMs_{i,t-1} + \beta_2 Big4_{i,t-1} + \beta_3 KAMs_{i,t-1} * Big4_{i,t-1} + \beta_4 Size_{i,t} +$$

$$\beta_5 CG_{i,t} + \beta_6 Lev_{i,t} + \beta_7 ROA_{i,t} + \beta_8 Ab.Acc_{i,t} + \beta_9 BM_{i,t} + \varepsilon_{i,t} \ (13)$$

$$Crash\_Count_{i,t} = \beta_0 + \beta_1 KAMs_{i,t-1} + \beta_2 Special_{i,t-1} + \beta_3 KAMs_{i,t-1} * Special_{i,t-1} + \beta_4 Size_{i,t} +$$

$$\beta_5 CG_{i,t} + \beta_6 Lev_{i,t} + \beta_7 ROA_{i,t} + \beta_8 Ab.Acc_{i,t} + \beta_9 BM_{i,t} + \varepsilon_{i,t} \ (14)$$

$$Crash\_Count_{i,t} = \beta_0 + \beta_1 KAMs_{i,t-1} + \beta_2 Tenure_{i,t-1} + \beta_3 KAMs_{i,t-1} * Tenure_{i,t-1} + \beta_4 Size_{i,t} +$$

$$\beta_5 CG_{i,t} + \beta_6 Lev_{i,t} + \beta_7 ROA_{i,t} + \beta_8 Ab.Acc_{i,t} + \beta_9 BM_{i,t} + \varepsilon_{i,t} \ (15)$$

Table (4) panel (B) shows the estimation results of models (13&14) after using a different proxy of stock price crash risk. The β_3 remains consistently negative and significant (β_3 = -0.137, p < 0.01 and -0.194, p < 0.05 respectively). Accordingly, the results are consistent for both specifications. In model (15) β_3 remain positive however insignificant (β_3 = 0. 241, p > 0.05).

Table 4. Robustness Tests

PANEL A			
ROBUSTNESS TEST OF CAUSALITY EFFECT			
DEPENDENT VARIABLE	$DUVOL_{i,t}$		
VARABILE	Model (10)	(11)	(12)
$KAMs_{i,t-1}$	-0.015** (0.002)	-0.015* (0.050)	0.049* (0.000)
$Big4_{i,t-1}$	-0.011** (0.041)		
$KAMs_{i,t-1} * Big4_{i,t-1}$	-0.133** (0.000)		
$Special_{i,t-1}$		-0.009** (0.091)	
$KAMs_{i,t-1} * Special_{i,t-1}$		-0.184** (0.014)	
$Tenure_{i,t-1}$			0.011 (0.045)
$KAMs_{i,t-1} * Tenure_{i,t-1}$			0.243** (0.014)
$Size_{i,t}$	0.264** (0.001)	0.217*** (0.050)	0.173*** (0.050)
$CG_{i,t}$	-0.010 (0.072)	-0.006 (0.047)	0.052 (0.054)
$Lev_{i,t}$	0.003 (0.001)	0.003* (0.001)	0.004 (0.002)

$ROA_{i,t}$	-0.211 (0.017)	-0.377 (0.045)	-0.255 (0.036)
$Ab.Acc_{i,t}$	-0.012* (0.005)	-0.012* (0.003)	−0.015*** (0.009)
$BM_{i,t}$	−0.018*** (0.000)	−0.017*** (0.000)	−0.015*** (0.132)
N	559		
ADJUSTED R^2	0.242	0.477	0.431

PANEL B			
ROBUSTNESS TEST WITH ALTERNATIVE MEASURE			
DEPENDENT VARIABLE	$Crash\_Count_{i,t}$		
VARABILE	Model (13)	(14)	(15)
$KAMs_{i,t-1}$	*-0.011** (0.064)*	*-0.010* (0.130)*	*0.073* (0.01)*
$Big4_{i,t-1}$	*-0.057** (0.036)*		
$KAMs_{i,t-1} * Big4_{i,t-1}$	-0.137*** (0.004)		
$Special_{i,t-1}$		*-0.007*** (0.192)*	
$KAMs_{i,t-1} * Special_{i,t-1}$		-0.194** (0.019)	
$Tenure_{i,t-1}$			*0.012 (0.040)*
$KAMs_{i,t-1} * Tenure_{i,t-1}$			0.241** (0.272)
$Size_{i,t}$	0.239** (0.005)	0.217*** (0.055)	0.131*** (0.055)
$CG_{i,t}$	*-0.007 (0.072)*	-0.005 (0.041)	0.051 (0.051)
$Lev_{i,t}$	0.002 (0.000)	0.002* (0.001)	0.003 (0.001)
$ROA_{i,t}$	-0.211 (0.017)	-0.376 (0.045)	-0.251 (0.035)
$Ab.Acc_{i,t}$	-0.012* (0.005)	-0.012* (0.003)	−0.015** (0.009)
$BM_{i,t}$	−0.017** (0.001)	−0.016** (0.001)	−0.014** (0.129)
N	559		
ADJUSTED R^2	0.292	0.489	0.466

*, **, *** significance at the 0.10, 0.05, and 0.01 level (2-tailed) respectively.

7. Discussion

Prior literature in auditing and management provides evidence that there is a negative association between auditing and managerial opportunistic behavior. What is not yet clear is the impact of KAMs disclosure on managerial bad news hoarding behavior. This study attempts to fill this gap in the literature. The main objective of this

study is to examine the effect of KAMs disclosure on managerial bad news hoarding behavior and the likelihood of stock price crashes. In addition, a further investigation is done, by employing the importance of audit firm size, auditor industry specialization and audit tenure, to explore the consequences of audit firm characteristics.

The analyses reveal that firms which disclosed about KAMs in the previous year have a negative impact on managerial bad news hoarding behavior, by decreasing the likelihood of stock price crash risk in the current year. The analyses of the relationship between KAMs disclosure and managerial bad news hoarding behavior provide strong evidence, that larger and industry-specialized audit firms promote KAMs role in reducing managerial bad news hoarding behavior and decreasing the likelihood of stock price crashes. However, this relationship only holds for Big4 and industry-specialized firms. The most striking result to emerge from the data is that long audit tenure has a positive impact on managerial bad news hoarding behavior. This interpretation contrasts with that of Callen and Fang (2017) who argue that long audit tenure has a learning perspective to mitigate managerial opportunistic behavior. This finding suggests that KAMs disclosure is potentially compromised when the auditor has long audit tenure.

This research has thrown up some questions in need of further investigation. Research is required to determine the efficiency of KAM disclosures. More information on the level of KAMs disclosure would help to establish a greater degree of accuracy on KAMs disclosures. Therefore, further research regarding the level of KAMs disclosure would be worthwhile. Another possible area of future research would be to investigate KAMs disclosure with other implications of managerial opportunistic behavior such as earnings management, compensation contracts and stock options.

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