



Dealing with Ethical Dilemmas: A Look at Financial Reporting by Firms Facing Product Harm Crises

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Abstract

A product harm crisis (PHC) undermines a firm's reputation as well as its managers' career outlook. To shake off the stigmatization resulting from the PHC and regain a firm's legitimacy among stakeholders, managers usually face an ethical dilemma as they choose to be transparent about the crisis' financial implications or to obfuscate them to neutralize the negative impact of the PHC. We find evidence that managers engage in income-increasing earnings management when their firms experience PHCs. Moreover, while income-increasing earnings management in PHCs reduces the likelihood of customer loss and CEO forced turnover in the short run, such behavior can be deemed opportunistic and unethical as it carries long-run negative consequences in terms of a higher likelihood of accounting restatement and weaker future operating performance. Finally, managers in firms that are subject to stricter external monitoring and managers in firms with proactive ethical policies are less likely to engage in upward earnings management in PHCs.

Keywords Product harm crisis · Earnings management · Ethical financial reporting · Firm reputation

Introduction

Product harm crises (PHCs) are publicized events in which a firm's product is reported as being defective and/or fails to fulfill a mandatory safety standard (Dawar and Pillutla 2000). In recent years, the frequency of PHCs has more than doubled across a wide range of industries (Advisen 2018). Increased product and supply chain complexities imply that the costs incurred to address a PHC as well as the risk faced by corporate directors and top managers in a PHC are trending up (Allianz Global Corporate and Specialty 2017). In particular,

PHCs are associated with significant adverse publicity that can stigmatize not only a firm's products but also its overall reputation (Devers et al. 2009), therefore severely undermining its economic and social legitimacies among its stakeholders (Erickson et al. 2017; Noack et al. 2019). Ultimately, managers of firms experiencing PHCs (hereafter crisis firms), especially the chief executive officer (CEO), risk losing their reputation as well as financial and human capital if the crisis lingers and financial performance suffers as a result.¹

In this paper, our objective is threefold. First, we examine if managers resort to income-increasing financial reporting discretion to enhance a firm's financial performance in order

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¹ Coca-Cola's 1999 PHC in Europe provides a vivid illustration of the potential consequences of a PHC (Mitroff and Silvers 2010, pp. 7–9). Following production problems at bottling plants in France and Belgium, more than 200 consumers ended up ill after drinking the firm's products and McDonald's even stopped serving Coke in its restaurants. A major product recall ensued as the governments of several countries banned the firm's products. Beyond its health effects on consumers and the economic costs to the firm, the PHC ultimately cost Coca-Cola's CEO, Ken Ivester, his job less than 2 years after his appointment. A 20-year Coca-Cola veteran with an impeccable record, Mr. Ivester was perceived to have mishandled the crisis, thus exposing the firm to additional economic and reputational costs. The Coca-Cola PHC also illustrates that the range of stakeholders affected by a PHC can be wide, encompassing consumers, management, shareholders, governments, regulators, suppliers, and employees (if plants are shut down or production is stopped).

to shake off the stigma associated with a PHC and regain legitimacy among stakeholders. Second, if income-increasing financial reporting in PHCs exists, we assess the nature and economic consequences of such reporting behavior. To this end, we explore whether income-increasing earnings management in PHCs helps managers mitigate stigmatization in the short run but is opportunistic and unethical that brings long-term costs. Third, if income-increasing financial reporting in PHCs is indeed opportunistic, we further investigate whether external monitoring and an internal ethical environment can alleviate such opportunistic financial reporting behavior in PHCs.

We consider that our study sheds new light on how firms confront reputation crises in order to avoid stigmatization and retain legitimacy among stakeholders when the ethicality of the actions may be questionable. In a crisis setting such as a PHC, managers face a dilemma as they decide either to engage in earnings management to obfuscate the PHC's financial implications and neutralize the negative impact of PHCs, or to be transparent and allow the financial consequences of PHCs to appear unbiasedly in the financial statements. Snyder et al. (2006) argue that a crisis provides lens through which ethical values are more likely to be revealed, given that crises usually impose strain upon firms that can activate moral beliefs that are not active in everyday events (Fritzsche and Becker 1983). Prior research typically examines managers' earnings management behaviors from capital markets and contracting incentives perspectives (e.g., meeting/beating analyst forecasts and obtaining external capital). Given that PHCs affect a much wider range of stakeholders beyond capital providers (e.g., customers and employees) and that different stakeholders may hold conflicting interests (Sorell and Sandberg 2011), PHCs raise ethical challenges to a firm's financial reporting practices, making the ethical implications of managers' earnings management behavior particularly salient and broader than that in other circumstances.

While not all within-GAAP earnings management is intentionally deceptive, it can be misleading when it is a result of managers' opportunistic incentives (Healy and Wahlen 1999). Such practice often distorts a firm's underlying economic reality and is unethical, as it is not fair to financial statements' various users and potentially biases their actions (Vladu et al. 2017). Earnings management can also lead a firm down a slippery slope of deception (Frecka 2008) that ultimately results in a corporate scandal and even bankruptcy and causes considerable social wealth losses such as a layoff of employees. By looking at how PHCs may lead managers to engage in earnings management, and at the short- and long-term consequences from such action, our paper responds to the call by Melé et al. (2017) to analyze further the causes and consequences of ethical, and unethical, financial reporting.

There are several reasons why managers may seek to manage earnings upward when faced with a PHC. A PHC is a reputation-damaging event that casts doubt about a firm's product quality and safety, potentially stigmatizes the organization as a whole (Hudson 2008; Hudson and Okhuysen 2009). Consistent with PHCs undermining the legitimacy of an organization among its stakeholders, prior evidence shows that such crises decrease customers' purchase intentions (Devin and Halpern 2001). Projecting a better financial image by showing strong earnings can reassure customers that the firm has the resources to continue investing in product quality and thus is still a legitimate supplier. In this sense, enhanced financial performance, as reflected in a firm's financial statements, is potentially a mean of convincing customers to maintain their purchase intentions. Furthermore, organizational stigma can spillover to managers who usually bear some responsibility for a firm's course of actions, thereby severely compromising the managers' career prospects (Sutton and Callahan 1987). Managers may choose to manage earnings upward as a way to attenuate personal costs associated with PHCs such as forced turnover (Fudenberg and Tirole 1995).

Nevertheless, there are also reasons for managers not to engage in income-increasing earnings management when faced with a PHC. As a publicized event, a PHC attracts attention from auditors, investors, creditors, customers, and suppliers who are likely to increase monitoring and scrutiny of the crisis firm, which in turn increases the detection risk and constrains the managers' opportunities to manage earnings (Chia et al. 2007; Francis et al. 2013; Filip and Raffournier 2014). Moreover, managers may consider that transparent and truthful financial reporting is the appropriate response in such a time of crisis because an ethical behavior reinforces their own credentials and reputation (Spalding and Oddo 2011). As a result, it remains an empirical question as to whether managers engage in income-increasing earnings management when faced with PHCs and what are the consequences if they indeed do so.

Using performance-matched signed discretionary accruals (Kothari et al. 2005) as a proxy for upward earnings management, we investigate a sample of U.S. nonfinancial firms from 2002 to 2012. We rely on the product quality concern indicator from the MSCI KLD dataset to identify firms that experienced PHCs during our sample period. Based on a two-stage regression with an instrumental variable, we find that crisis firms exhibit significantly greater income-increasing discretionary accruals than non-crisis firms. The result is robust when we use a matched sample based on propensity score matching or when we balance the covariates using entropy balancing. Moreover, when we limit our sample to first-time crisis firms only, we find that firms in the crisis year exhibit significantly greater positive discretionary accruals than in non-crisis years. Those results are consistent

with managers engaging in upward earnings management when facing a PHC.

When we examine the economic consequences of income-increasing earnings management in PHCs, we find that managers in crisis firms that extensively engage in earnings management through discretionary accruals derive short-term benefits in terms of a lower likelihood of losing major customers and reduced risk of CEO turnover in the year immediately after the crisis. These results suggest that income-increasing earnings management helps managers mitigate the stigmatization resulted from PHCs. However, in the long-run, crisis firms extensively engaging in earnings management are more likely to restate their crisis year financial statements and exhibit a weaker future operating performance, suggesting that upward earnings management in PHCs is associated with long-term negative consequences. These results imply that managing earnings upward in PHCs can be deemed opportunistic and unethical in nature as it carries costs to the firm and its stakeholders in the long-run, even though doing so helps managers attenuate stigmatization in the short run.

Finally, while managers have incentives to opportunistically manage earnings upwards in PHCs, we find that stricter external monitoring reduces managers' propensity to do so. We also find that a corporate environment that values ethical behaviors serves as an effective mechanism that mitigates unethical earnings management in PHCs.

The current study makes the following contributions. First, given that the number of PHCs is growing in recent years, it is important to understand their causes as well as their consequences (e.g., Jarrell and Peltzman 1985; Chen et al. 2009; Thirumalai and Sinha 2011; Shah et al. 2016). In this context, how firms react to PHCs is a critical issue (Haunschild and Rhee 2004). Prior research documents that managers react to PHCs by adopting marketing and social media communications strategies (e.g., Chen et al. 2009; Cleeren et al. 2013; Lee et al. 2015), with consumers being influenced to some extent by these strategies (e.g., Kim 2014; Carvalho et al. 2015). Our study complements these prior findings by showing that, in the short run, managers can confront the reputation stigma and legitimacy challenges arising from a PHC by leveraging their financial reporting discretion to attenuate the negative implications of the PHC on their firms and on themselves.

Second, we show that although managers can use financial reporting discretion to mitigate stigmatization resulting from a PHC, the income-increasing earnings management during PHCs can be deemed opportunistic and unethical. Since PHCs influence a wide range of stakeholders, the ethical implications of managers' financial reporting behavior in PHCs are broader and especially salient. While prior work tends to rely on the premise that managers will take optimal strategies in reacting to crises and mitigating the negative

impact (e.g., Seeger and Ulmer 2001; Bauman 2010; Coldwell et al. 2012; Koehn and Goranova 2014; Carvalho et al. 2015), we show that managers can react to crises through financial reporting that is unethical and potentially distorts the firm's underlying fundamentals. Such behavior has real adverse effects on the firm, its managers, and its stakeholders in the long run.

Third, this study contributes to the earnings management literature, particularly the one investigating customers' implicit claims as an incentive for firms to manipulate earnings (Bowen et al. 1995; Burgstahler and Dichev 1997; Matsumoto 2002; Raman and Shahrur 2008; Dou et al. 2013).² Bowen et al. (1995) argue that customers' perception of firms' reputation to fulfill implicit claims can be bolstered by reporting high earnings. We identify a specific setting in which an operational problem threatens firms' perceived abilities to fulfill implicit claims to customers, and we find that managers use their accounting discretion to unethically manage earnings upwards to temporarily influence customers' perception. However, such efforts with an opportunistic incentive ultimately fail in the long-run.

The rest of the paper is organized as follows. Section 2 discusses prior literature and develops our hypotheses. Section 3 discusses our sample and research design. Section 4 reports empirical results. Additional analyses and robustness checks are discussed in Sect. 5. Section 6 concludes the paper.

Prior Literature and Hypothesis Development

Stigmatization and Loss of Legitimacy Resulting from Reputation Crises

A PHC can be a traumatic event for a firm and its managers. PHCs are often associated with reports of deaths, injuries, and illness among customers, and thus can lead a variety of stakeholders, especially customers but also investors and suppliers, to evaluate, in a critical manner, a firm's outputs (Grougiou et al. 2016). Such evaluation extends beyond the specific product that is subject to the PHC and can affect the firm's brand and reputation as a whole (Mirabito et al. 2016). In other words, a PHC represents a situation that has the potential of "escalating and

² The implicit claims normally have no legal standing, and hence they can be breached by either party. However, Bull (1987) argues that there are forces that prevent firms from breaching the implicit claims. Rather, firms have incentives to build their reputation as having the ability to fulfill the implicit claims because such reputation ultimately determines the trade terms between firms and their stakeholders (Cornell and Shapiro 1987; Titman 1984).

negatively impacting credibility and reputation” (Snyder et al. 2006, p. 372). Social discredit can fall upon a firm as the PHC, and the disclosures surrounding it, induce negative stereotyping by different stakeholders (Reuber and Fischer 2010).

The organizational stigma arising from the PHC can thus severely affect a firm’s reputation (Munyon et al. 2019) and, ultimately, its legitimacy (Noack et al. 2019). More specifically, a PHC reveals that there is a lack of congruence between a firm’s activities and widely accepted social norms of behavior, with such congruence being the foundation of organizational legitimacy (Dowling and Pfeffer 1975). Given prior evidence that poor financial performance affects reputation (Gatzert 2015; Fombrun et al. 2000) and can eventually stigmatize managers (Sutton and Callahan 1987), the costs and the resulted negative financial performance from PHCs, if revealed to the public, are expected to further undermine a firm’s legitimacy. In this regard, the costs of a PHC and the potential negative financial performance resulting from the PHC likely become a major concern for managers of crisis firms.

Indeed, the costs resulting from a PHC can be large, with the potential to affect greatly a firm’s financial performance. At one level, firms bear direct costs when a PHC occurs, such as the costs associated with correcting/replacing the defective product, the recall process, unsold inventory, and changes in practices to improve quality (Jarrell and Peltzman 1985). In the food industry, which exhibits the highest frequency of PHCs, current estimates suggest that firms incur direct costs of about \$10 million per recall (Heneghan 2016). For large recalls, these direct costs can skyrocket. For instance, based on General Motors’ 2014 annual report, the firm booked a \$4.1 billion charge for the recall of 30.2 million vehicles in 2014 (including 2.6 million cars that might have had a faulty ignition switch, which allegedly caused 51 deaths). Most of that charge related to the estimated repair costs to be incurred (\$2.8 billion).

Besides direct costs, firms also incur huge indirect costs in PHCs. Such costs mostly result from the impairment of a firm’s reputation and reduced purchase intentions from customers (Van Heerde et al. 2007). For instance, an analysis of large scale product recalls by Bloomberg (2013) reports that Peanut Corporation of America lost \$1 billion in production and sales following a salmonella-tainted peanut butter recall in 2009. The Cadbury Schweppes recall of salmonella-tainted chocolate bars in 2006 cost more than £20 million (close to \$26 million), plus a 14% drop in chocolate bar sales. A Harris Interactive poll illustrates the far-reaching effect of a PHC on a firm’s sales by reporting that 55% of respondents would consider switching brands

temporarily following a recall, 15% would never buy the recalled product, and 21% would never buy any brand made by the same manufacturer (Harris Interactive 2007).

Confronting PHCs: Some Ethical Dilemmas

During and in the aftermath of a PHC, managers face severe pressure to shake off the stigma arising from the PHC and to regain their firm’s and their own legitimacy among stakeholders. Prior research finds that stigmatized firms often strive to deflect stakeholder critical views and regain legitimacy by resorting to various impression management or ceremonial tactics (e.g., Bansal and Clelland 2004; Zavyalova et al. 2012). For example, managers in a PHC often conduct strategic communication by claiming their involvement in corporate social responsibility (CSR) matters, take different recall actions, and engage in intensive marketing (e.g., advertising) (Chen et al. 2009; Vanhamme and Grobben 2009; Zavyalova et al. 2012; Cleeren et al. 2013; Gao et al. 2015).

While some of those strategies are effective in mitigating the negative consequences of PHCs, there is less discussion about the moral perspective and content of those actions. For example, prior studies find that crisis firms may delay the recall process in a passive manner to shift the responsibility to other entities, instead of proactively issuing a voluntary recall early in the process and taking actions to address the cause of the product quality issue. Alternatively, crisis firms may engage in ceremonial actions, i.e., actions that do not address the cause of the product harm but aim at altering stakeholders’ impression of the firm, thus deflecting stakeholder attention away from the wrongdoing (Chen et al. 2009; Zavyalova et al. 2012). Those passive strategies and ceremonial actions raise ethical issues even though they may help the crisis firms mitigate the negative influence of the PHCs. Indeed, the PHC context resembles the dilemma situation described by Umphress and Bingham (2011), in which managers can engage in unethical pro-organizational behavior that allows them to derive benefits at the expense of other stakeholders while making the behavior seem beneficial to their organizations in the short run.

In this paper, our objective is to examine the financial reporting behavior of PHC firms as well as the short- and long-run consequences associated with their financial reporting behavior. By looking at the short- and long-term economic consequences, we can better assess the nature of the financial reporting discretion that managers undertake to confront the reputation crises, which prior literature usually overlooks.

Financial Reporting in PHCs

One ethical dilemma faced by managers in PHCs is that they can choose either to be transparent about the true financial implications of the crisis or to manage earnings to project a better financial image and neutralize the negative consequences of PHCs on their firm's legitimacy and on their own. In the literature, there are two different views of earnings management. On one hand, some argue that Generally Accepted Accounting Principles (GAAP) provide managers with discretion over accounting choices and that earnings management is used by managers to convey their private information and expectations about a firm's future performance (Holthausen 1990; Arya et al. 2003). On the other hand, concerns have been raised that too much opportunistic manipulation is involved in exercising such accounting discretion and earnings management has become a "purposeful intervention in the external financial reporting process with the intent of misleading stakeholders" (Schipper 1989, p. 92) and biasing contractual outcomes to obtain some private gain (Healy and Wahlen 1999).

Although there is no consensus, financial reporting is deemed corrupted and immoral if it makes it appear that the firm's reported performance is better than its true performance (Akerlof and Shiller 2016). Such behavior, even within the boundaries of compliance, is increasingly perceived as unethical, not because of its violation of GAAP or investor protection laws but because of its misleading nature that clashes with social norms such as fairness (Shafer 2002; Carpenter and Reimers 2005; Vladu et al. 2017). Major corporate scandals in history also illustrate that earnings management can result in a slippery slope of deception that ultimately causes huge corporate fraud, such as Enron and WorldCom, with significant negative social consequences (McLean and Elkind 2003; Palmer 2012).³

There are some arguments suggesting that crisis firms' managers may be hesitant to engage in upward earnings management in the wake of a PHC. This is because the PHC attracts extensive, and typically negative, media coverage (Rhee and Haunschild 2006; Zavyalova et al. 2012), leading auditors, investors, creditors, customers, and suppliers to increase monitoring and scrutiny over the crisis firms, which in turn restrains managers from manipulating earnings (Chia et al. 2007). Consistent with this argument, prior studies find that firms suffering consecutive losses and exposed to a financial crisis exhibit more conservative accounting choices

³ Since the advent of the Sarbanes-Oxley Act of 2002 and following the global financial crisis (2007–2009), stakeholders from various arenas have become increasingly critical of the ethics underlying certain financial reporting practices that were previously deemed as "business as usual" (e.g., Cryan and Theriault 2012; Sherman and Young 2016).

(DeAngelo et al. 1994; Francis et al. 2013; Filip and Raffournier 2014). Moreover, to the extent that managers perceive that being ethical and transparent in financial reporting in a crisis may enhance their reputation, they may be unwilling to engage in earnings management during PHCs.

Regardless of the above arguments, managers' incentives to manage earnings upward can be intense when they face a PHC. Projecting a better financial image by showing strong earnings can help comfort customers in their purchase intentions. When selling products, a firm enters into both explicit and implicit contracts with its customers, and a large part of the ongoing relationship between the firm and its customers remains implicit. For instance, customers usually expect a certain product quality level, as well as a commitment to provide parts and services, timely delivery, warranty service, and future enhancements (Cornell and Shapiro 1987; Baker et al. 2002). Both existing and future customers' willingness to buy from a firm is affected by their perceptions of the firm's ability to honor its implicit commitments in the product market (Maksimovic and Titman 1991; Bowen et al. 1995). Customers care about the financial image of the firm from which they purchase products and services, as the financial image influences the customers' perceptions as to whether the firm will be able to honor implicit claims in the future. Given the reputation damage induced by a PHC (Jarrell and Peltzman 1985; Cornell and Shapiro 1987; Devin and Halpern 2001), truthfully reporting the negative financial implications of the PHC can further lower customers' purchase intentions, as customers are worried that the crisis firm will not be able to honor future implicit claims due to the lack of sufficient financial resources. For example, customers may worry that crisis firms with financial constraints will switch to low-quality components, reduce future supply, and fail to honor warranty claims in the future (Titman 1984; Maksimovic and Titman 1991; Opler and Titman 1994; Hammond 2013). Through earnings management, managers can misleadingly project a better financial image to reassure customers that the firm has abundant financial resources and thus is competent to fulfill its implicit claims in the long term (Bowen et al. 1995; Aaker et al. 2010; Tian and Zhou 2015).⁴ Arguably, customers cannot easily discern earnings management done by the managers, or it is too costly for them to do so. In line with this argument, prior

⁴ Bowen et al. (1995) illustrate that customers care about firms' accounting numbers including earnings. One example in their paper shows that LeCie advertised that customers can trust the company because its hard drives are backed by \$400 million in assets and thus the company is a reliable source of high-quality machines and components. Moreover, media usually pays much attention to and publicizes firms' earnings performance after PHCs. For example, Samsung hit the news headlines because of the Note 7 recall, but subsequent news reports specifically mentioned its soaring fourth quarter earnings (Yahoo 2017).

studies document that firms use upward earnings management to avoid losses (Burgstahler and Dichev 1997), to meet analyst forecasts (Matsumoto 2002), and to portray a rosy financial prospect (Raman and Shahrur 2008) in a bid to influence customers' assessments of firms' future abilities to fulfill their implicit claims. When surveying executives, Graham et al. (2005) report that a majority of chief financial officers (CFOs) are willing to manipulate earnings to manage customers' perceptions.

Furthermore, a PHC likely stigmatizes managers and undermines their own legitimacy as leaders (Marcel and Cowen 2014), thus further reinforcing their motivation to manage earnings upward as a mean to shake off the stigma. Since the PHC has a direct negative influence on a firm's profit and stock price, top managers who bear direct or indirect responsibility for the crisis can be fired. To the extent that earnings affect boards' decisions on retention of top managers (Engel et al. 2003), the job security concern likely leads managers to shift future earnings into the current period in order to avoid being fired or delay forced resignation (Fudenberg and Tirole 1995; Choi et al. 2014). In other words, managers may untruthfully present better financial performance in the year of a PHC to decrease the likelihood of dismissal. Given the above arguments, we put forward the following directional hypothesis:

Hypothesis 1 Product harm crises are associated with income-increasing earnings management.

Potential Consequences of Earnings Management in PHCs

Does earnings management work as a temporary legitimacy-restoring tool for managers and their firms? If managers engage in upward earnings management in PHCs to mislead stakeholders and benefit their self-interests, we expect that in the short run, by camouflaging the PHC's real negative impact on financial performance, managers can mislead customers and thus retain their relations with them. Managers can also personally benefit from the untruthful financial performance by lowering the risk of forced turnover. Hence, we conjecture that upward earnings management in PHCs likely brings short-term benefits in terms of retaining customers and reducing CEO turnover. Accordingly, we put forward the following hypotheses:

Hypothesis 2a In the short run, PHC firms extensively engaging in income-increasing earnings management are less likely to lose major clients.

Hypothesis 2b In the short run, PHC firms extensively engaging in income-increasing earnings management are less likely to experience CEO turnover.

While earnings management brings short-term benefits, this opportunistic behavior likely carries long-term negative consequences if such earnings management is deceptive and unethical in nature. Prior studies document that there is a positive association between upward earnings management and the likelihood of accounting fraud in the same year (Dechow et al. 1996). Facing the pressure of boosting earnings, firms that have fully used the most aggressive earnings management within GAAP may even turn to fraudulent financial reporting to further manipulate reported earnings. Once the material misstatements are subsequently detected by the regulators or auditors, they will result in accounting restatement and even financial fraud scandals. Therefore, we expect that, if managers extensively engage in upward earnings management in PHCs, there will be a higher likelihood of financial statements being restated in the future. We also expect that if managers facing a PHC use earnings management to obscure its negative impact on a firm's financial performance, there is an upper bound to the extent that they can do so, at which point the true underlying performance will unfold. Hence, the long-term financial performance of crisis firms in which managers have resorted to extensive earnings management likely be weaker than other crisis firms. Accordingly, we make the following hypotheses:

Hypothesis 3a In the long run, PHC firms extensively engaging in income-increasing earnings management are more likely to restate crisis year financial statements.

Hypothesis 3b In the long run, PHC firms extensively engaging in income-increasing earnings management have worse operating performance.

Factors Constraining Earnings Management in PHCs

Prior studies find that when facing intensive external monitoring, managers are less likely to engage in earnings management (Bradshaw et al. 2017). This is because stronger external monitoring mechanisms help detect earnings management behavior and in turn, *ex ante*, lower managers' incentives to do so. Also, in corporations that cultivate high ethical standards, managers exposed to such an ethical culture are expected to have enhanced awareness of the importance of ethics, and thus are less likely to engage in deceptive earnings management. We therefore hypothesize that:

Hypothesis 4a PHC firms are less likely to engage in income-increasing earnings management when there is greater external monitoring.

Hypothesis 4b PHC firms are less likely to engage in income-increasing earnings management when the firm has a better ethical corporate environment.

Research Design

Sample and Data

We rely on the MSCI KLD database (KLD) to identify firms that experience PHCs. Specifically, KLD reports the number of strengths and concerns related to firms' engagements in product safety and quality on a yearly basis. According to MSCI (2015), the product concern indicator is "designed to assess the severity of controversies related to the quality and safety of a firm's products and services." Kashmiri and Brower (2016) validate the product quality concern variable in KLD and confirm that it is a reliable indicator of PHCs. Hence, we consider a firm to have a PHC in a year if the firm is identified to have a product quality concern in KLD in that year.

Our main sample consists of nonfinancial U.S. firms from 2002 to 2012. We start the sample in 2002 because KLD's coverage has significantly improved since 2002; we stop our sample in 2012 because we need data from leading years to conduct analyses of long-term consequences. We first merge KLD with Compustat and obtain an initial sample consisting of 19,119 firm-year observations for our sample period. We then obtain other necessary variables for the regressions from different data sources, including stock returns data from CRSP, restatement and auditor information from Audit Analytics, institutional shareholdings from Thomson Reuters 13-F forms, segment information from Compustat Historical Segment Files, and a managers' ability index from Peter Demerjian's website (Demerjian et al. 2012).⁵ A total of 17,168 observations remain in the sample after merging different data sources. We require industries defined by two-digit SIC codes in the sample to have at least one incidence of PHC during the sample period and accordingly remove 711 observations. After further deleting firms with missing values in the main regression, 11,040 firm-years are left in the sample in which 885 have experienced PHCs. Panel A of Table 1 presents the sample distribution by year. The percentage of firms having PHCs ranges from 6 to 15 percent across years in our sample period. Panel B of Table 1 reports the sample distribution by industry. A total of 68 percent of sample firms with PHCs come from manufacturing industries.

⁵ Available at: <http://faculty.washington.edu/pdemerj/data.html>, accessed March 15, 2019.

Measure of Income-Increasing Earnings Management

We use fiscal-year-end signed discretionary accruals as our proxy for income-increasing earnings management.⁶ Consistent with prior literature, we first estimate the following Jones model (Jones 1991) for each industry-year using all U.S. firms with available information in Compustat in which an industry is defined by two-digit SIC codes:

$$\frac{TACC_{i,t}}{ASSET_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{ASSET_{i,t-1}} + \alpha_2 \frac{\Delta SALES_{i,t}}{ASSET_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{ASSET_{i,t-1}} + \varepsilon_{i,t} \quad (1)$$

For each firm i in year t , $TACC$ is the total accruals defined as income before extraordinary items minus operating cash flows; $ASSET$ is the total assets; $\Delta SALES$ is the change of sales from $t-1$ to t ; and PPE is the property, plant, and equipment. Discretionary accruals (DA) are calculated as the difference between observed total accruals (scaled by lagged total assets) and predicted normal accruals based on the parameters estimated in the above regression. We then adjust DA by performance (Kothari et al. 2005; Liu et al. 2018). Specifically, we construct five portfolios for each industry-year based on quantiles of ROA . Performance-matched DA ($PMDA$) for firm i in year t is the residual from the above equation minus the median residual of the ROA portfolio to which the firm belongs.⁷

Analyzing the Existence of Income-Increasing Earnings Management in PHCs

We use a two-stage model with an instrument variable (IV) to test Hypothesis 1, given the potential selection bias arising from the fact that firms are not randomly assigned to

⁶ Managers can anticipate a product recall several months before its public announcement (Chen et al. 2009; Gao et al. 2015; Gokalp et al. 2016). Thus, even if a PHC occurs towards year-end, managers may engage in earnings management during the year before its announcement. For this reason, we focus on annual estimates rather than more granular quarterly estimates of earnings management. Nevertheless, we hand collected data on recall dates for a subsample of crisis firms in our main analysis. Analyzing 64 firms with fourth quarter product recalls, we find that their quarterly discretionary accruals exhibit an increasing trend up to the third quarter and a slight decrease in the fourth quarter, which is consistent with managers manipulating accruals even before they announce the product recalls in the fourth quarter.

⁷ As robustness checks, we use discretionary accruals derived from modified Jones (1991) model and performance-adjusted modified Jones (1991) model as described in Kothari et al. (2015) and find consistent results.

Table 1 Sample distribution

Year		Number of observations without PHC	Number of observations with PHC
Panel A: Sample distribution by year			
2002		229	34
2003		382	39
2004		434	45
2005		1037	67
2006		1066	69
2007		1067	76
2008		1099	93
2009		1180	97
2010		1196	147
2011		1213	107
2012		1252	111
Total		10,155	885
Two-digit SIC	Industry name	Number of observations without PHC	Number of observations with PHC
Panel B: Sample distribution by industry			
10–14	Mining	546	22
15–17	Construction	50	10
20–29	Manufacturing—Part 1	1665	292
30–39	Manufacturing—Part 2	3727	316
40–49	Transportation, communication, utilities	694	56
50–59	Wholesale and retail trade	1380	98
70–89	Services	2093	91
Total		10,155	885

This table presents the sample distribution of firm-years with and without PHCs. Panel A presents distribution by year, and Panel B presents distribution by industry

have PHCs.⁸ In the first stage, we model firms' probabilities of experiencing PHCs and calculate the Inverse Mills Ratio (*IMR*). In the second stage, we test whether having PHCs exhibit a significant effect on income-increasing earnings manipulation while controlling for *IMR*. The first-stage probit regression (Eq. 2) and the second-stage ordinary least squares (OLS) regression (Eq. 3) are specified as follows:

$$CRISIS_{i,t} = \beta_0 + \beta_1 IndustryPHC_{i,t} + \sum \beta_k DETERMINE_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$PMDA_{i,t} = \beta_0 + \beta_1 CRISIS_{i,t} + \beta_2 IMR_{i,t} + \sum \beta_k CONTROL_{i,t} + \varepsilon_{i,t} \quad (3)$$

where for each firm *i* in year *t*, *CRISIS* equals 1 if the firm has a product-related crisis, and 0 otherwise. We add *IndustryPHC* as the exclusion restriction in the first-stage prediction model. *IndustryPHC* is measured as the average number of PHCs for the industry to which the firm belongs. Conceptually, industry-level average PHCs should have a significant predictive power for firm-level PHCs, but industry-level PHCs should not directly influence firm-level discretionary accruals, particularly because the discretionary accruals are calculated as the residuals from regressions estimated within each industry-year. *DETERMINE* in Eq. (2) is a set of other variables that could influence the likelihood of PHCs. Specifically, we include firm size (*LogMV*), number of business segments (*SEG*), leverage (*LEV*), market-to-book ratio (*MTB*), lagged operating performance (*LagROA*), lagged sales growth (*LagGROWTH*), lagged cash holding (*LagCASH*), lagged stock return (*LagRETURN*), lagged

⁸ We use the two-stage regression with an IV to alleviate the concern that unobservable factors drive both a firm's likelihood of experiencing a PHC and its earnings management behavior (Tucker 2010; Lennox et al. 2012). In Sect. 5.1, we conduct additional robustness tests using propensity score matching and entropy balancing to further mitigate the endogeneity concern arising from observable differences in firm characteristics between crisis and non-crisis firms.

working capital (*LagWC*), and lagged discretionary accruals (*LagPMDA*). Moreover, we add managerial ability (*MA*) and the percentage of institutional shareholding (*IO*), given that product safety issues also can be influenced by managers' competency and external monitoring. We also add an indicator variable of whether firms raised additional capital (*FINANCE*). Finally, we add industry fixed effects and year fixed effects.

Based on the estimations of Eq. (2), we calculate *IMR* and add it into the second-stage regression, as depicted by Eq. (3). We add all determinant variables in Eq. (2) as control variables, which are represented by the variable *CONTROL* in Eq. (3). Industry and year fixed effects are also included. If managers of crisis firms engage in income-increasing earnings management when faced with a PHC, the coefficient on *CRISIS* in Eq. (3) should be significant and positive.

Analyzing Short- and Long-Term Consequences of Earnings Management in PHCs

To assess whether income-increasing earnings management allows managers of crisis firms to obtain short-term benefits but leads to long-term adverse effects, we estimate the following regression:

$$\begin{aligned} \text{CONSEQUENCE}_{i,t+n} = & \beta_0 + \beta_1 \text{CRISIS}_{i,t} + \beta_2 \text{HighDA}_{i,t} \\ & + \beta_3 \text{CRISIS} \times \text{HighDA}_{i,t} + \sum \beta_k \text{CONTROL}_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (4)$$

In the above equation, *CONSEQUENCE* is the short- or long-term consequences that we test. *CRISIS* is defined the same as before. We separate firms into high and low discretionary accruals firms based on the median value of *PMDA* in each year. Variable *HighDA* is an indicator variable that equals 1 for firms having relatively high-level discretionary accruals, and 0 for firms having relatively low-level discretionary accruals. Our variable of interest is the interaction term *CRISIS* × *HighDA*, which shows the incremental effect of having high-level discretionary accruals on short- and long-term consequences for crisis firms relative to non-crisis firm.

We focus on short-term consequences in the year immediately following the crisis year. For the analysis of losing major clients (Hypothesis 2a), variable *LOSSCLIENT* is included as the dependent variable, which equals 1 if a firm loses at least one major client in the year following the PHC, and 0 otherwise. We use customer information disclosed in the Segment File of Compustat to identify firms' major customers. Compustat Segment Files contain firms' major customers that contribute to 10 percent or more of the suppliers' sales. To evaluate whether income-increasing earnings management reduces the likelihood that a crisis firm's CEO

will be terminated (Hypothesis 2b), we obtain CEO turnover data from the ExecuComp database. Variable *LEAVE* equals 1 if a CEO left her company in the year following the PHC, and 0 otherwise. In constructing the variable *LEAVE*, we exclude cases in which the turnover reason provided in ExecuComp is "deceased" or "retired." If managers of crisis firms engaging in income-increasing earnings management are more likely to retain large clients and are exposed to a lower risk of being terminated, we expect β_3 to be significantly negative for both the analysis of losing clients and the analysis of CEO turnover.

We examine two long-term consequences: accounting restatement and future operating performance. To test whether upward earnings management in PHCs is associated with a higher likelihood of subsequent accounting restatement (Hypothesis 3a), we construct a variable *RESTATE*, an indicator variable that equals 1 if a firm's financial statements in year *t* are subsequently restated, and 0 otherwise. We obtain restatement data from Audit Analytics which discloses the restated period for each restatement. A firm's financial statements in year *t* are considered to be restated if the fiscal-year-end of year *t* falls into the restated period. We only consider restatement caused by accounting issues and fraud and exclude those attributable to mere clerical errors or changes in accounting standards. If crisis firms extensively engaging in income-increasing earnings management experience a higher likelihood of restatement in the future, we expect β_3 to be significantly positive when *RESTATE* is used as the dependent variable. To test the effect of earnings management in PHCs on future performance (Hypothesis 3b), we measure future operating performance by the average change in *ROA* (*ChgROA*) for year *t* + 3 and *t* + 4, given year *t* as the crisis year. If engaging in income-increasing earnings management in PHCs brings long-term negative consequences in terms of poorer future operating performance in crisis firms, we expect β_3 to be significantly negative.

Analyzing Mechanisms Constraining Earnings Management in PHCs

To test Hypothesis 4a, we use the number of analysts who follow a firm (*COVERAGE*) as a proxy for external monitoring and investigate whether the degree of income-increasing earnings management exhibited in crisis firms relative to non-crisis firms is mitigated as more analysts follow the firm. Data on the analyst coverage are derived from I/B/E/S. To examine Hypothesis 4b, we measure a firm's ethical environment by the firm's corporate social responsibility (CRS) performance score related to environment protection (*ETHICENV*). Information on firms' performance related to environment protection is obtained from KLD. We then run the following regression:

$$PMDA_{i,t} = \beta_0 + \beta_1 CRISIS_{i,t} + \beta_2 COVERAGE \text{ (or } ETHICENV)_{i,t} + \beta_3 CRISIS \times COVERAGE \text{ (or } ETHICENV)_{i,t} + \sum \beta_k CONTROL_{i,t} + \varepsilon_{i,t} \quad (5)$$

If external monitoring and ethical corporate culture attenuate managers' opportunistic incentives to manage earnings upward in crisis firms, we expect β_3 to be significantly negative; that is, the positive association between *CRISIS* and *PMDA*, captured by the positive coefficient of β_1 , decreases as *COVERAGE* or *ETHICENV* increases.

Results

Results on the Existence of Income-Increasing Earnings Management in PHCs

Panel A of Table 2 reports descriptive statistics of variables used in the analysis, and Panel B of Table 2 tabulates correlations between these variables. The pair-wise correlations of *CRISIS* and other control variables, as well as correlations among the control variables, are not large, suggesting that multicollinearity is not a serious concern in our regression model. The untabulated univariate comparison suggests that the mean *PMDA* of crisis firms is -0.004 , whereas the mean *PMDA* of non-crisis firms is -0.012 . The difference is statistically significant (t -statistic = 1.77, $p < 0.05$, one-tailed), providing preliminary evidence that crisis firms have greater positive discretionary accruals than non-crisis firms.

Table 3 provides the results of the two-stage regression. The first-stage probit regression results are reported in Panel A. The coefficient of *IndustryPHC* is significant and positive (0.088; $p < 0.01$), consistent with our prediction that industry-level incidences of PHCs have significant predictive power for the probability that individual firms within the industry experience PHCs. The results also show that larger firms, firms with more business segments, and firms with a higher leverage ratio are more likely to have PHCs. Moreover, firms with better prospects (i.e., higher market-to-book ratio and sales growth), a better cash position, and additional external financing are less likely to experience PHCs. Note that *LagPMDA* is not statistically significant, which alleviates the concern of reverse causality.

Panel B of Table 3 presents the results of the second-stage regression as described in Eq. (3). The Variance Inflation Factor (VIF) of *CRISIS* and *IMR* are 7.23 and 6.58, respectively, suggesting that multicollinearity is not an issue in our second-stage analysis (Lennox et al. 2012).⁹ The coefficient

of *CRISIS* is significant and positive (0.034; $p < 0.05$), indicating that having a PHC is associated with significantly higher discretionary accruals, consistent with our Hypothesis 1 that managers in crisis firms engage in earnings management through income-increasing discretionary accruals. Regarding the economic significance, crisis firms exhibit an increase in performance-adjusted discretionary accruals that is equivalent to 3.4 percent of lagged total assets. This increase is economically significant, given that the interquartile range of *PMDA* in our sample is 9 percent of lagged total assets. Note that the greater *PMDA* we document for crisis firms is not likely attributable to the reversal of *PMDA* before the crisis, as we include lagged *PMDA* to control for the effect of accruals reversals.

Results on the Consequences of Earnings Management in PHCs

Table 4 reports regression results regarding the short-term consequences of earnings management in PHCs. The sample size varies across tables as some data are not available from certain firms (e.g., major client losses and CEO turnover). Column (1) of Table 4 presents the results for losing major clients. We find that the coefficient of the interaction term *CRISIS* × *HighDA* is marginally significant (-0.239 ; $p < 0.10$), suggesting that, to some degree, managing earnings upwards helps crisis firms reduce the risk of losing major clients in the short run. Column (2) of Table 4 reports the results for CEO turnover. We find that the coefficient of *CRISIS* is positive and statistically significant (0.212; $p < 0.01$), implying that in crisis firms that do not extensively manage earnings upwards, CEOs suffer an increased risk of being terminated immediately following the PHCs. The coefficient of the interaction term *CRISIS* × *HighDA* is significant and negative (-0.232 ; $p < 0.05$), suggesting that engaging in upward earnings management significantly attenuates the risk of CEO turnover in crisis firms, which is consistent with our prediction. Collectively, results presented in Table 4 support Hypothesis 2b that extensively managing earnings upward in PHCs helps managers alleviate personal costs in the short term and provide supporting, albeit weaker, evidence for Hypothesis 2a that managing earnings upwards in PHCs helps managers retain large customers.

Table 5 presents the regression results for long-term consequences associated with extensive income-increasing earnings management in PHCs. Column (1) shows the results with respect to the likelihood of financial statements of crisis year being subsequently restated. We find that the

⁹ We also check the VIF of other control variables and none of them have VIF larger than three.

Table 2 Descriptive statistics and correlation matrix

Variable	<i>N</i>	Mean	Median	SD	P25	P75							
Panel A: Descriptive statistics of variables used in main regression													
<i>CRISIS</i>	11,040	0.080	0.000	0.272	0.000	0.000							
<i>PMDA</i>	11,040	-0.011	-0.008	0.128	-0.059	0.032							
<i>LogMV</i>	11,040	7.372	7.206	1.593	6.228	8.331							
<i>SEG</i>	11,040	2.671	2.000	2.060	1.000	4.000							
<i>LEV</i>	11,040	0.492	0.485	0.233	0.320	0.630							
<i>MTB</i>	11,040	2.925	2.168	3.441	1.355	3.526							
<i>CASH</i>	11,040	0.010	-0.024	0.141	-0.070	0.045							
<i>MA</i>	11,040	0.746	0.789	0.202	0.641	0.895							
<i>IO</i>	11,040	0.347	0.000	0.476	0.000	1.000							
<i>FINANCE</i>	11,040	0.323	0.230	0.300	0.089	0.479							
<i>ROA</i>	11,040	0.034	0.053	0.124	0.013	0.091							
<i>GROWTH</i>	11,040	0.105	0.082	0.228	-0.001	0.181							
<i>RETURN</i>	11,040	0.100	0.049	0.476	-0.191	0.295							
<i>WC</i>	11,040	0.251	0.225	0.205	0.095	0.384							
	1	2	3	4	5	6	7	8	9	10	11	12	13

Panel B: Correlation matrix

1	<i>CRISIS</i>													
2	<i>PMDA</i>	0.02												
3	<i>LogMV</i>	0.25	-0.06											
4	<i>SEG</i>	0.14	0.03	0.20										
5	<i>LEV</i>	0.15	0.02	0.13	0.11									
6	<i>MTB</i>	0.02	-0.03	0.20	-0.09	0.05								
7	<i>CASH</i>	0.02	-0.11	0.28	-0.04	-0.09	0.14							
8	<i>MA</i>	-0.01	-0.06	0.12	0.01	0.01	0.00	0.01						
9	<i>IO</i>	-0.08	0.03	-0.13	-0.07	-0.01	0.01	-0.01	0.01					
10	<i>FINANCE</i>	-0.11	-0.09	-0.16	-0.22	-0.34	0.21	0.19	-0.03	0.13				
11	<i>ROA</i>	0.06	0.11	0.33	0.04	-0.17	0.10	0.20	0.09	-0.21	-0.11			
12	<i>GROWTH</i>	-0.05	0.00	0.09	-0.06	-0.07	0.15	0.15	0.04	0.22	0.06	0.15		
13	<i>RETURN</i>	0.00	0.02	0.11	-0.01	0.00	0.13	0.02	-0.09	0.02	0.07	0.12	0.06	
14	<i>WC</i>	-0.12	-0.01	-0.27	-0.15	-0.54	0.06	0.08	-0.01	0.10	0.71	-0.02	0.05	0.04

Panel A of this table presents the descriptive statistics of variables used in the main regression. Panel B of this table presents the Pearson correlations between variables used in the main regression. Correlations significant at 10% level are in boldface. *CRISIS* is an indicator variable equal to 1 if a firm experiences a PHC in year *t*, and 0 otherwise; *PMDA* is performance-matched discretionary accruals; *LogMV* is the natural logarithm of total market value; *SEG* is the total number of business segments; *LEV* is leverage ratio calculated as total long-term debt to total assets; *MTB* is market-to-book ratio calculated as total year-end market value of equity to total book value of equity; *CASH* is cash ratio calculated as total cash and short-term investments to total assets; *MA* is managerial ability score; *IO* is the percentage of shares owned by institutional shareholders; *FINANCE* is an indicator variable equal to 1 for firms raising additional capital (equity or debt) in a year, and 0 otherwise; *ROA* is return on assets calculated as income before extraordinary items to total assets; *GROWTH* is sales growth ratio calculated as sales in year *t* minus sales in year *t* - 1 divided by sales in year *t* - 1; *RETURN* is annual stock return calculated as stock price in year *t* minus stock price in year *t* - 1 divided by stock price in year *t* - 1; *WC* is working capital calculated as total current assets minus total current liabilities divided by total assets

coefficient of *CRISIS* is not statistically significant, indicating that having PHCs does not lead to a higher risk of financial statements restatement when firms do not extensively manage earnings upwards. In line with our prediction in Hypothesis 3a, the coefficient of *CRISIS* × *HighDA* is significant and positive (0.260; *p* < 0.05), suggesting that extensive upward earnings management in crisis firms likely contains material misstatements that lead to subsequent accounting restatement.

Column (2) of Table 5 presents the results for future operating performance. We find that the coefficient of *CRISIS* × *HighDA* is negative and significant (-0.011; *p* < 0.05). This result supports the view that crisis firms extensively managing earnings upwards through discretionary accruals exhibit lower future changes in ROA. Overall, the finding is consistent with Hypothesis 3b that upward earnings management in the PHC is followed by worsened operating performance in the long run. Moreover, the result of

Table 3 Analysis of financial reporting in PHCs

Dependent variable	First-stage regression	
	<i>CRISIS</i>	
	Coefficient	z-statistics
Panel A: First-stage probit regression of product harm crisis occurrence		
<i>LogMV</i>	0.316***	(18.650)
<i>SEG</i>	0.063***	(6.396)
<i>LEV</i>	1.139***	(9.702)
<i>MTB</i>	-0.015**	(-2.436)
<i>MA</i>	-0.271	(-1.602)
<i>IO</i>	-0.142	(-1.162)
<i>FINANCE</i>	-0.146***	(-2.936)
<i>LagCASH</i>	-0.521***	(-3.477)
<i>LagROA</i>	0.729***	(2.953)
<i>LagGROWTH</i>	-0.614***	(-4.913)
<i>LagRETURN</i>	-0.031	(-0.585)
<i>LagWC</i>	0.518**	(2.270)
<i>LagPMDA</i>	-0.120	(-0.661)
<i>IndustryPHC</i>	0.088***	(8.278)
<i>Constant</i>	-3.569***	(-7.541)
Industry fixed effects	Yes	
Year fixed effects	Yes	
Pseudo R^2	0.284	
Observations	11,040	
Dependent variable	Second-stage regression	
	<i>PMDA</i>	
	Coefficient	t-statistics
Panel B: Second-stage OLS regression of signed discretionary accruals		
<i>CRISIS</i>	0.034**	(2.248)
<i>LogMV</i>	-0.004***	(-2.690)
<i>SEG</i>	0.002***	(2.878)
<i>LEV</i>	-0.000	(-0.004)
<i>MTB</i>	-0.000	(-0.431)
<i>MA</i>	-0.084***	(-6.445)
<i>IO</i>	-0.026***	(-3.376)
<i>FINANCE</i>	0.010***	(3.557)
<i>LagCASH</i>	-0.008	(-0.854)
<i>LagROA</i>	0.005	(0.174)
<i>LagGROWTH</i>	-0.033***	(-4.429)
<i>LagRETURN</i>	0.017***	(4.969)
<i>LagWC</i>	0.003	(0.215)
<i>LagPMDA</i>	0.080***	(4.808)
<i>IMR</i>	-0.014*	(-1.668)
<i>Constant</i>	-0.025	(-1.021)
Industry fixed effects	Yes	
Year fixed effects	Yes	
Adj. R^2	0.043	
Observations	11,040	

The table presents the results of a two-stage regression with instrumental variable to investigate income-increasing earnings management in PHC firms. Panel A presents the results of the probit regression examining the determinants of experiencing PHCs. Panel B presents the results of OLS regression examining the effect of experiencing PHCs on discretionary accruals. Standard errors are clustered at firm level. *CRISIS* is

Table 3 (continued)

an indicator variable equal to 1 if a firm experiences a PHC in year t , and 0 otherwise *PMDA* is performance-matched discretionary accruals; *LogMV* is the natural logarithm of total market value; *SEG* is the total number of business segments; *LEV* is leverage ratio calculated as total long-term debt to total assets; *MTB* is market-to-book ratio calculated as total year-end market value of equity to total book value of equity; *CASH* is cash ratio calculated as total cash and short-term investments to total assets; *MA* is managerial ability score; *IO* is the percentage of shares owned by institutional shareholders; *FINANCE* is an indicator variable equal to 1 for firms raising additional capital (equity or debt) in a year, and 0 otherwise; *ROA* is return on assets calculated as income before extraordinary items to total assets; *GROWTH* is sales growth ratio calculated as sales in year t minus sales in year $t-1$ divided by sales in year $t-1$; *RETURN* is annual stock return calculated as stock price in year t minus stock price in year $t-1$ divided by stock price in year $t-1$; *WC* is working capital calculated as total current assets minus total current liabilities divided by total assets; *IMR* is inverse Mill's ratio. Variables with a prefix *Lag* means lagged values

*, **, and *** indicate two-tailed statistical significance at 10, 5, and 1 percent levels, respectively. *Z*-statistics and *t*-statistics are reported in parentheses

reduced long-term operating performance for crisis firms with high discretionary accruals undermines the alternative explanation that crisis firms' managers manage earnings to signal their private information about future performance (Subramanyam 1996). If this alternative explanation holds, we should not observe the negative consequence on future changes in ROA as we document above.

Taken together, our analyses of short- and long-term consequences of upward earnings management in PHCs imply that managers in crisis firms engage in income-increasing earnings management that leads to restatement and poorer operating performance in the future. However, customers and boards of directors are somehow deceived by the unethical, misleading reporting choices in the short run, which suggests that income-increasing earnings management in PHCs is likely deceptive. Such result is also in line with prior evidence that even sophisticated information users cannot fully unravel earnings manipulation conducted by managers (e.g., Alissa et al. 2013; Liu et al. 2018). Our findings reflect the moral dilemma faced by managers in PHCs, as manipulating earnings upward in the PHC appears pro-organizational in the short run (Umpress and Bingham 2011) and helps restore legitimacy among stakeholders (e.g., customers). However, such unethical behavior leads to negative consequences in terms of a higher propensity of accounting restatement and worse future performance in the long run.

Results on Mechanisms That Mitigate Earnings Management in PHCs

Results regarding the role of external monitoring in constraining earnings management in crisis firms are reported in Column (1) of Table 6. We find a significant and positive coefficient of *CRISIS* (0.066; $p < 0.01$), suggesting that crisis firms not followed by financial analysts use discretionary accruals to engage in income-increasing earnings management in PHCs. However, such earnings management behavior is mitigated by the monitoring from financial analysts, which is reflected by the significantly negative coefficient of *CRISIS* × *COVERAGE* (−0.007; $p < 0.05$). This result is

consistent with our prediction in Hypothesis 4a that monitoring by external parties reduces managers' opportunistic incentives to manipulate earnings in a PHC setting, as the detection risk and costs will be high.

Column (2) of Table 6 shows the regression results in relation to the role of an ethical corporate environment in mitigating earnings management in PHCs. We find that, while the main effect of *CRISIS* remains significant and positive (0.059; $p < 0.01$), the interaction term *CRISIS* × *ETHI-CENV* is significant and negative (−0.009; $p < 0.01$). This result is in line with our expectation in Hypothesis 4b that managers working in a corporate environment that emphasizes and values ethical behaviors have enhanced awareness of the need to maintain corporate ethics and hence are less likely to engage in opportunistic earnings management when facing a PHC.

Additional Analyses

Robustness Checks: Propensity Score Matching and Entropy Balancing

Our main analysis relies on a two-stage analysis with an IV to alleviate the endogeneity issue arising from the omitted unobservable characteristics that may drive both the incidences of PHCs and income-increasing earnings management. According to Tucker (2010), Lennox et al. (2012), and Shipman et al. (2017), the endogeneity issue can also arise from observable differences in firm characteristics between crisis and non-crisis firms. We employ propensity score matching (PSM) and entropy balancing to mitigate this concern. Specifically, following the suggestions from Shipman et al. (2017), we first model firms' likelihood of experiencing PHCs using all control variables (excluding *IMR*) in the main regression as the predictors, including industry and year fixed effects, where industries are defined by Fama-French 12 industries classification. We then match each crisis firm with a non-crisis firm that has the closet propensity score. The matching is performed without replacement and

Table 4 Analysis of short-term consequences of earnings management in PHCs

Dependent variable	(1)		(2)	
	$LOSSCLIENT_{t+1}$		$LEAVE_{t+1}$	
	Coefficient	z-statistics	Coefficient	z-statistics
<i>CRISIS</i>	-0.018	(-0.185)	0.212***	(2.633)
<i>HighDA</i>	0.017	(0.403)	-0.003	(-0.084)
<i>CRISIS</i> × <i>HighDA</i>	-0.239*	(-1.713)	-0.232**	(-2.011)
<i>LogMV</i>	-0.057***	(-2.861)	-0.064***	(-4.584)
<i>SEG</i>	0.040***	(3.855)	0.003	(0.338)
<i>LEV</i>	-0.312**	(-2.436)	0.035	(0.462)
<i>MTB</i>	0.003	(0.447)	-0.001	(-0.164)
<i>MA</i>	-0.036	(-0.210)	0.147	(1.062)
<i>IO</i>	-0.005	(-0.042)	0.188	(1.626)
<i>FINANCE</i>	0.041	(0.909)	-0.028	(-0.674)
<i>CASH</i>	0.119	(0.957)	0.356***	(3.179)
<i>ROA</i>	-0.407*	(-1.940)	-1.092***	(-5.859)
<i>GROWTH</i>	-0.033	(-0.297)	-0.023	(-0.262)
<i>RETURN</i>	0.142***	(3.068)	-0.182***	(-3.396)
<i>WC</i>	-0.047	(-0.224)	-0.363**	(-2.014)
<i>CEOTENURE</i>	-0.003	(-1.051)	-0.033***	(-11.560)
<i>CEOAGE</i>	-0.001	(-0.346)	0.049***	(16.517)
<i>Constant</i>	-0.003	(-0.004)	-2.489***	(-6.090)
Industry fixed effects	Yes		Yes	
Year fixed effects	Yes		Yes	
Pseudo R^2	0.033		0.077	
Observations	6215		8237	

The table presents the results for the analysis of the short-term consequences of upward earnings management in PHCs. Column (1) reports the results of a probit regression examining the probability of losing major clients in the year immediately after a PHC. Column (2) presents the results of a probit regression examining the probability of CEO forced turnover in the year immediately after a PHC. Standard errors are clustered at firm level. *CRISIS* is an indicator variable equal to 1 if a firm experiences a PHC in year t , and 0 otherwise; *HighDA* an indicator variable equal to 1 for firms that have performance-matched discretionary accruals higher than the median value in a year, and 0 otherwise; *LogMV* is the natural logarithm of total market value; *SEG* is the total number of business segments; *LEV* is leverage ratio calculated as total long-term debt to total assets; *MTB* is market-to-book ratio calculated as total year-end market value of equity to total book value of equity; *CASH* is cash ratio calculated as total cash and short-term investments to total assets; *MA* is managerial ability score; *IO* is the percentage of shares owned by institutional shareholders; *FINANCE* is an indicator variable equal to 1 for firms raising additional capital (equity or debt) in a year, and 0 otherwise; *ROA* is return on assets calculated as income before extraordinary items to total assets; *GROWTH* is sales growth ratio calculated as sales in year t minus sales in year $t-1$ divided by sales in year $t-1$; *RETURN* is annual stock return calculated as stock price in year t minus stock price in year $t-1$ divided by stock price in year $t-1$; *WC* is working capital calculated as total current assets minus total current liabilities divided by total assets; *CEOTENURE* is CEO tenure calculated as the number of years that a CEO has been in the CEO position; *CEOAGE* is the CEO's age

*, **, and *** indicate two-tailed statistical significance at 10, 5, and

Table 4 (continued)

1 percent levels, respectively. Z-statistics are reported in parentheses

we impose common support and require the difference in propensity scores to be less than 0.05.¹⁰

Out of 885 crisis firms in the full sample, we successfully match 805 crisis firms to non-crisis firms. Panel A of Table 7 presents the comparisons of control variables between crisis and non-crisis firms before and after PSM. It shows that the two groups of firms exhibit significant differences in various firm characteristics before matching, but that the covariates no longer show any significant differences after matching, supporting the covariate balance. Regression results based on the matched sample are presented in Panel B of Table 7. We find that the coefficient of *CRISIS* remains statistically significant and positive (0.012; $p < 0.05$), suggesting that matched crisis firms exhibit significantly greater discretionary accruals than matched non-crisis firms. The result provides further support to our main finding.

We use entropy balancing as an alternative way to mitigate the observable differences between crisis and non-crisis firms without losing observations to enhance generalizability. Entropy balancing relies on a maximum entropy reweighting scheme that fits weights to balance the covariates across treatment and control groups (Hainmueller and Xu 2013). We balance the control variables' means and standard deviations between crisis and non-crisis firms. Regression results (untabulated) with entropy balancing show that the coefficient of *CRISIS* remains positive and statistically significant (0.012; $p < 0.01$).

Robustness Checks: Self-Comparison Within First-Time Crisis Firms

Our main analysis relies on a pooled sample of both crisis and non-crisis firms. As a further robustness check, we restrict our sample to first-time crisis firms and examine whether *PMDA* significantly increases from pre-crisis period to crisis period. A firm in year t is defined as a first-time crisis firm if the firm experiences a PHC in year t but does not have any PHC in the 3 years prior to year t . For each first-time crisis firm in year t , we define variable *POST* to be 0 for the pre-crisis period that includes year $t-2$ to $t-1$, and 1 for the crisis period that includes year t and $t+1$. We then regress *PMDA* on *POST* and other control variables. Following Liu et al. (2018), we adjust all variables by the industry-year median values of non-crisis

¹⁰ Our results are not sensitive to the cut-off of difference in propensity scores. Our results stay the same if the cut-off is set to be 0.1 or 0.01.

Table 5 Analysis of long-term consequences of earnings management in PHCs

Dependent variable	(1)		(2)	
	RESTATE		AChgROA _{t+3, t+4}	
	Coefficient	z-statistics	Coefficient	t-statistics
CRISIS	-0.183	(-1.494)	0.005	(1.392)
HighDA	-0.032	(-0.833)	0.001	(0.408)
CRISIS × HighDA	0.260**	(2.128)	-0.011**	(-2.036)
LogMV	-0.024	(-1.080)	0.001	(1.501)
SEG	0.001	(0.053)	-0.001	(-1.486)
LEV	0.103	(0.676)	0.012	(1.473)
MTB	-0.004	(-0.588)	-0.002**	(-2.058)
MA	0.314	(1.524)	-0.012	(-1.333)
IO	0.300**	(2.035)	0.006	(0.991)
FINANCE	0.059	(1.455)	-0.004	(-1.493)
CASH	-0.047	(-0.496)	0.001	(0.191)
ROA	-0.401**	(-2.086)	-0.050**	(-2.198)
GROWTH	-0.035	(-0.402)	-0.010	(-0.917)
RETURN	-0.047	(-1.181)	-0.003	(-0.766)
Z-SCORE	-0.018**	(-2.313)	0.001	(1.392)
Constant	-1.206***	(-2.597)	0.022**	(2.267)
Industry Fixed Effects	Yes		Yes	
Year Fixed Effects	Yes		Yes	
Adjusted/Pseudo R ²	0.045		0.042	
Observations	9962		8558	

The table presents the regression results for the analysis of the long-term negative consequences of upward earnings management in PHCs. Column (1) reports the results for a probit regression examining the probability of financial statements of the crisis year being subsequently restated. Column (2) reports the results for an OLS regression examining future operating performance. Standard errors are clustered at firm level. *CRISIS* is an indicator variable equal to 1 if a firm experiences a PHC in year *t*, and 0 otherwise; *HighDA* an indicator variable equal to 1 for firms that have performance-matched discretionary accruals higher than the median value in a year, and 0 otherwise; *LogMV* is the natural logarithm of total market value; *SEG* is the total number of business segments; *LEV* is leverage ratio calculated as total long-term debt to total assets; *MTB* is market-to-book ratio calculated as total year-end market value of equity to total book value of equity; *CASH* is cash ratio calculated as total cash and short-term investments to total assets; *MA* is managerial ability score; *IO* is the percentage of shares owned by institutional shareholders; *FINANCE* is an indicator variable equal to 1 for firms raising additional capital (equity or debt) in a year, and 0 otherwise; *ROA* is return on assets calculated as income before extraordinary items to total assets; *GROWTH* is sales growth ratio calculated as sales in year *t* minus sales in year *t* - 1 divided by sales in year *t* - 1; *RETURN* is annual stock return calculated as stock price in year *t* minus stock price in year *t* - 1 divided by stock price in year *t* - 1; *Z-SCORE* is Altman Z-score that measures financial distress

*, **, and *** indicate two-tailed statistical significance at 10, 5, and 1 percent levels, respectively. Z-statistics and t-statistics are reported in parentheses

Table 6 Mechanisms mitigating earnings management in PHCs

Dependent variable	(1)		(2)	
	PMDA		PMDA	
	Coefficient	t-statistics	Coefficient	t-statistics
CRISIS	0.066***	-3.068	0.059***	-3.337
COVERAGE	-0.007***	(-4.049)		
CRISIS × COVERAGE	-0.007**	(-2.195)		(-3.404)
ETHICENV			0.001	(-0.54)
CRISIS × ETHICENV			-0.009***	(-3.404)
LogMV	-0.001	(-0.286)	-0.004***	(-2.794)
SEG	0.002**	(-2.264)	0.002***	(-2.737)
LEV	-0.001	(-0.121)	-0.001	(-0.152)
MTB	0.000	(-0.436)	-0.000	(-0.420)
MA	-0.082***	(-6.306)	-0.085***	(-6.477)
IO	-0.019**	(-2.396)	-0.025***	(-3.329)
FINANCE	0.012***	(-3.98)	0.011***	(-3.632)
LagCASH	-0.005	(-0.510)	-0.008	(-0.790)
LagROA	0.000	(-0.009)	0.004	(-0.1554)
LagGROWTH	-0.030***	(-4.034)	-0.032***	(-4.340)
LagRETURN	0.015***	(-4.509)	0.017***	(-4.929)
LagWC	0.001	(-0.081)	0.003	(-0.182)
LagPMDA	0.080***	(-4.773)	0.080***	(-4.797)
IMR	-0.020**	(-2.358)	-0.019**	(-2.262)
Constant	-0.043*	(-1.781)	-0.030	(-1.120)
Industry fixed effects	Yes		Yes	
Year fixed effects	Yes		Yes	
Adj. R ²	0.045		0.043	
Observations	11,040		11,040	

This table presents the regression results for the analysis of the mechanisms that constrain earnings management in PHCs. Column (1) reports the results for external monitoring proxied by analyst following (*COVERAGE*). Column (2) reports the results for ethical corporate environment proxied by corporate performance in environmental protection (*ETHICENV*). Standard errors are clustered at firm level definitions. *CRISIS* is an indicator variable equal to 1 if a firm experiences a PHC in year *t*, and 0 otherwise; *LogMV* is the natural logarithm of total market value; *SEG* is the total number of business segments; *LEV* is leverage ratio calculated as total long-term debt to total assets; *MTB* is market-to-book ratio calculated as total year-end market value of equity to total book value of equity; *CASH* is cash ratio calculated as total cash and short-term investments to total assets; *MA* is managerial ability score; *IO* is the percentage of shares owned by institutional shareholders; *FINANCE* is an indicator variable equal to 1 for firms raising additional capital (equity or debt) in a year, and 0 otherwise; *ROA* is return on assets calculated as income before extraordinary items to total assets; *GROWTH* is sales growth ratio calculated as sales in year *t* minus sales in year *t* - 1 divided by sales in year *t* - 1; *RETURN* is annual stock return calculated as stock price in year *t* minus stock price in year *t* - 1 divided by stock price in year *t* - 1; *WC* is working capital calculated as total current assets minus total current liabilities divided by total assets; *IMR* is inverse Mill's ratio. Variables with a prefix *Lag* means lagged values

*, **, and *** indicate two-tailed statistical significance at 10, 5, and 1 percent levels, respectively. T-statistics are reported in parentheses

Table 7 Analysis Based on Propensity Score Matching

	Before matching			After matching		
	Non-crisis firms	Crisis firms	Mean difference (<i>t</i> -statistics)	Non-crisis firms	Crisis firms	Mean difference (<i>t</i> -statistics)
	Mean	Mean		Mean	Mean	
Panel A: Covariate mean differences before and after propensity score matching						
<i>LogMV</i>	7.255	8.722	-27.147***	8.434	8.484	-0.624
<i>SEG</i>	2.584	3.679	-15.336***	3.560	3.401	1.280
<i>LEV</i>	0.482	0.607	-15.456***	0.608	0.607	0.147
<i>MTB</i>	2.907	3.130	-1.850*	2.988	3.059	-0.368
<i>MA</i>	0.010	0.019	-1.878*	0.000	0.011	-1.321
<i>IO</i>	0.747	0.742	0.715	0.743	0.751	-0.846
<i>FINANCE</i>	0.358	0.223	8.158***	0.263	0.239	1.149
<i>LagCASH</i>	0.336	0.218	10.996***	0.215	0.219	-0.421
<i>LagROA</i>	0.033	0.058	-5.252***	0.056	0.055	0.386
<i>LagGROWTH</i>	0.126	0.062	7.504***	0.058	0.065	-0.781
<i>LagRETURN</i>	0.098	0.101	-0.181	0.099	0.109	-0.425
<i>LagWC</i>	0.262	0.169	12.836***	0.172	0.174	-0.220
<i>LagDA</i>	-0.002	0.009	-0.831	0.004	0.007	0.085
Dependent variable				<i>PMDA</i>		
				Coefficient	<i>t</i> -statistics	
Panel B: Regression results based on matched sample						
<i>CRISIS</i>				0.012**	(2.018)	
<i>LogMV</i>				0.004	(1.481)	
<i>SEG</i>				0.001	(0.890)	
<i>LEV</i>				0.028	(1.494)	
<i>MTB</i>				-0.001	(-0.845)	
<i>MA</i>				-0.095***	(-3.144)	
<i>IO</i>				0.000	(0.011)	
<i>FINANCE</i>				-0.003	(-0.366)	
<i>LagCASH</i>				-0.024	(-1.073)	
<i>LagROA</i>				-0.029	(-0.460)	
<i>LagGROWTH</i>				0.002	(0.077)	
<i>LagRETURN</i>				0.008	(0.916)	
<i>LagWC</i>				0.073**	(1.978)	
<i>LagPMDA</i>				0.023	(0.554)	
Constant				-0.066	(-1.555)	
Industry fixed effects				Yes		
Year fixed effects				Yes		
Adj. <i>R</i> ²				0.068		
Observations				1610		

The table presents the results of regression results based on propensity score matched sample. Panel A presents the covariate mean differences before and after matching. Panel B presents the results of OLS regression examining the effect of experiencing PHCs on discretionary accruals based on the propensity score matched sample. Standard errors are clustered at firm level. *CRISIS* is an indicator variable equal to 1 if a firm experiences a PHC in year *t*, and 0 otherwise. *PMDA* is performance-matched discretionary accruals; *LogMV* is the natural logarithm of total market value; *SEG* is the total number of business segments; *LEV* is leverage ratio calculated as total long-term debt to total assets; *MTB* is market-to-book ratio calculated as total year-end market value of equity to total book value of equity; *CASH* is cash ratio calculated as total cash and short-term investments to total assets; *MA* is managerial ability score; *IO* is the percentage of shares owned by institutional shareholders; *FINANCE* is an indicator variable equal to 1 for firms raising additional capital (equity or debt) in a year, and 0 otherwise; *ROA* is return on assets calculated as income before extraordinary items to total assets; *GROWTH* is sales growth ratio calculated as sales in year *t* minus sales in year *t* - 1 divided by sales in year *t* - 1; *RETURN* is annual stock return calculated as stock price in year *t* minus stock price in year *t* - 1 divided by stock price in year *t* - 1; *WC* is working capital calculated as total current assets minus total current liabilities divided by total assets. Variables with a prefix *Lag* means lagged values

*, **, and *** indicate two-tailed statistical significance at 10, 5, and 1 percent levels, respectively. Z-statistics and *t*-statistics are reported in parentheses

firms. Because all variables of crisis firms are adjusted against their non-crisis peers, examining whether there is greater earnings management during the crisis period within these crisis firms resembles a differences-in-differences design and further mitigates the concern that the result based on the pooled sample may be due to the endogeneity of the crisis firms.

We identify 138 (552) unique first-time crisis firms (firm-years) with available information in both pre-crisis and crisis periods. Table 8 reports the regression results. The coefficient on *POST* is positive and marginally significant (0.023; $p < 0.10$), providing some evidence that *PMDA* of first-time crisis firms significantly increases in the crisis period compared to the pre-crisis period. This result further corroborates the view that managers of crisis firms manipulate earnings upward when faced with a PHC.

Do Customers and Directors See Through the Earnings Management in the Long Run?

We document that engaging in earnings management in PHCs brings short-term benefits to managers of crisis firms in terms of a lower likelihood of losing major clients and CEO dismissal. A follow-up question is whether customers and directors ultimately see through the deceptive earnings management, resulting in reversal of those short-term benefits obtained from managers' opportunistic behavior in the long run. Empirically, it is not clear how earnings manipulation in the PHC year would influence long-term client losses and CEO turnover because of the potential confounding factors that exist in a long period. Nevertheless, to shed light on this issue, we follow the research design for our consequence analyses and distinguish firms that are high or low in discretionary accruals and interact *HighDA* with *CRISIS* to test whether crisis firms with greater discretionary accruals in the crisis year t are associated with an increased likelihood of losing clients as well as a higher likelihood of CEO turnover in years $t+3$ and $t+4$.

Results are reported in Table 9, which shows a positive and marginally significant coefficient of *CRISIS* × *HighDA* for both the test of losing clients (0.264; $p < 0.10$) and the test of CEO turnover (0.194; $p < 0.10$). These results suggest that crisis firms engaging more extensively in upward earnings management in the crisis year experience an increased likelihood of losing clients and CEO dismissal in the long run.

Real-Activities Manipulation

Prior literature finds that managers engage in both accruals-based earnings management (AEM) and real-activities manipulations (REM) to achieve earnings targets (Roychowdhury

Table 8 Analysis of pre- and post-crisis periods for first-time crisis firms

Dependent variable	<i>PMDA</i>	
	Coefficient	<i>t</i> -statistics
<i>POST</i>	0.023*	(1.940)
<i>LogMV</i>	−0.000	(−0.052)
<i>SEG</i>	0.001	(0.338)
<i>LEV</i>	0.049	(1.020)
<i>MTB</i>	0.000	(0.079)
<i>MA</i>	−0.083	(−1.608)
<i>IO</i>	0.083*	(1.705)
<i>FINANCE</i>	0.039***	(2.803)
<i>LagCASH</i>	−0.070	(−1.512)
<i>LagROA</i>	0.058	(0.590)
<i>LagGROWTH</i>	−0.061*	(−1.898)
<i>LagRETURN</i>	0.024	(1.390)
<i>LagWC</i>	0.060	(0.826)
<i>LagPMDA</i>	−0.090*	(−1.885)
<i>Constant</i>	−0.002	(−0.052)
Industry fixed effects	Yes	
Year fixed effects	Yes	
Adj. R^2	0.156	
Observations	552	

The table presents the results of a regression examining discretionary accruals of first-time crisis firms across pre-crisis and crisis periods. Standard errors are clustered at firm level. *POST* is an indicator variable equal to 0 for the pre-crisis period that includes year $t-2$ to $t-1$ and 1 for the crisis period that includes year t and $t+1$, given t is the crisis year. *PMDA* is performance-matched discretionary accruals; *LogMV* is the natural logarithm of total market value; *SEG* is the total number of business segments; *LEV* is leverage ratio calculated as total long-term debt to total assets; *MTB* is market-to-book ratio calculated as total year-end market value of equity to total book value of equity; *CASH* is cash ratio calculated as total cash and short-term investments to total assets; *MA* is managerial ability score; *IO* is the percentage of shares owned by institutional shareholders; *FINANCE* is an indicator variable equal to 1 for firms raising additional capital (equity or debt) in a year, and 0 otherwise; *ROA* is return on assets calculated as income before extraordinary items to total assets; *GROWTH* is sales growth ratio calculated as sales in year t minus sales in year $t-1$ divided by sales in year $t-1$; *RETURN* is annual stock return calculated as stock price in year t minus stock price in year $t-1$ divided by stock price in year $t-1$; *WC* is working capital calculated as total current assets minus total current liabilities divided by total assets. Variables with a prefix *Lag* means lagged values

*, **, and *** indicate two-tailed statistical significance at 10, 5, and 1 percent levels, respectively. *T*-statistics are reported in parentheses

2006), and that they trade off the two types of earnings management depending on the costs associated with each type of manipulation (Cohen and Zarowin 2010; Zang 2012). In this study, we focus on AEM in PHCs and its ethical implications. While it is possible that managers also engage in REM in PHCs, the incentives for REM can be much lower compared to those for AEM in a PHC setting. This is because a PHC

Table 9 Do customers and directors see through the earnings management in the long-run?

Dependent variable	(1)		(2)	
	$LOSSCLIENT_{t+3, t+4}$		$LEAVE_{t+3, t+4}$	
	Coefficient	z-statistics	Coefficient	z-statistics
<i>CRISIS</i>	-0.186	(-1.631)	-0.124	(-1.446)
<i>HighDA</i>	-0.031	(-0.734)	0.015	(0.428)
<i>CRISIS</i> × <i>HighDA</i>	0.264*	(1.832)	0.194*	(1.713)
<i>LogMV</i>	-0.039*	(-1.715)	-0.004	(-0.234)
<i>SEG</i>	-0.031**	(-2.491)	-0.014	(-1.444)
<i>LEV</i>	-0.392***	(-2.619)	-0.235**	(-2.421)
<i>MTB</i>	-0.001	(-0.671)	0.002	(0.336)
<i>MA</i>	-0.115	(-0.648)	0.085	(0.629)
<i>IO</i>	-0.039	(-0.263)	0.351***	(2.802)
<i>FINANCE</i>	0.036	(0.793)	0.019	(0.503)
<i>CASH</i>	0.015	(0.096)	0.379***	(3.118)
<i>ROA</i>	-0.557**	(-2.356)	-0.592***	(-2.927)
<i>GROWTH</i>	0.214*	(1.733)	-0.008	(-0.136)
<i>RETURN</i>	-0.084*	(-1.875)	-0.038	(-0.948)
<i>WC</i>	0.085	(0.355)	-0.731***	(-3.692)
<i>CEOTENURE</i>	-0.003	(-0.802)	-0.005*	(-1.825)
<i>CEOAGE</i>	-0.006	(-1.469)	0.017***	(5.421)
<i>Constant</i>	0.270	(0.361)	-1.381**	(-2.279)
Industry fixed effects	Yes		Yes	
Year fixed effects	Yes		Yes	
Pseudo R^2	0.033		0.026	
Observations	5455		7580	

The table presents the results for the analysis of whether directors and customers see through the earnings management in PHCs in the long-run. Column (1) reports the results of a probit regression examining the probability of losing major clients in year $t+3$ and $t+4$, given t as the crisis year. Column (2) presents the results of a probit regression examining the probability of CEO forced turnover in year $t+3$ and $t+4$, given t as the crisis year. Standard errors are clustered at firm level. *CRISIS* is an indicator variable equal to 1 if a firm experiences a PHC in year t , and 0 otherwise; *HighDA* an indicator variable equal to 1 for firms that have performance-matched discretionary accruals higher than the median value in a year, and 0 otherwise; *LogMV* is the natural logarithm of total market value; *SEG* is the total number of business segments; *LEV* is leverage ratio calculated as total long-term debt to total assets; *MTB* is market-to-book ratio calculated as total year-end market value of equity to total book value of equity; *CASH* is cash ratio calculated as total cash and short-term investments to total assets; *MA* is managerial ability score; *IO* is the percentage of shares owned by institutional shareholders; *FINANCE* is an indicator variable equal to 1 for firms raising additional capital (equity or debt) in a year, and 0 otherwise; *ROA* is return on assets calculated as income before extraordinary items to total assets; *GROWTH* is sales growth ratio calculated as sales in year t minus sales in year $t-1$ divided by sales in year $t-1$; *RETURN* is annual stock return calculated as stock price in year t minus stock price in year $t-1$ divided by stock price in year $t-1$; *WC* is working capital calculated as total current assets minus total current liabilities divided by total assets; *CEOTENURE* is CEO tenure calculated as the number of years that a CEO has been in the CEO position; *CEOAGE* is the CEO's age

*, **, and *** indicate two-tailed statistical significance at 10, 5, and 1 percent levels, respectively. Z-statistics are reported in parentheses

pertains specifically to the potential problems embedded in a firm's operations and should inevitably attract enhanced attention to and scrutiny of the crisis firm's operations and productions. The costs associated with REM are thus relatively high, particularly when some external monitors such as institutional shareholders are found to be explicitly concerned about firms' suboptimal operations (Zang 2012).

To provide a more complete picture of managers' earnings management in PHCs, we follow Roychowdhury (2006) and calculate abnormal discretionary expenses, abnormal production costs, and abnormal operating cash flows, the three commonly used measures for REM. Untabulated results show that crisis firms have marginally higher abnormal discretionary expenses and lower abnormal production costs than non-crisis firms. The result for abnormal operating cash flows is not statistically significant. The marginally higher abnormal discretionary expenses and lower abnormal production costs are inconsistent with income-increasing REM. Rather, the marginally higher abnormal discretionary expenses may be attributable to the expenses associated with handling the PHCs; the lower abnormal production costs could be related to managers' reduced incentives to over-produce when faced with a PHC, given the firms' products are facing problems. To further shed light on the potential consequences of abnormal production in PHCs, we perform analyses on the relation between current abnormal production levels and major client loss and CEO turnover in either the short run or the long run. We do not find any significant results.

In the face of a PHC, managers may also sell assets as a legitimate action to conserve cash and/or increase earnings to fulfill contractual obligations (such as debt covenants) or settle future contingent liabilities associated with the PHC (such as lawsuits). One may harbor a concern that the high discretionary accruals we document for crisis firms reflect this legitimate action rather than unethical earnings management. To rule out this alternative explanation, we examine whether crisis firms engage more in sales of assets. Our untabulated analysis suggests that managers of crisis firms do not engage in more extensive asset sales to enhance cash levels and reported earnings.

Conclusion

PHCs have been gaining prevalence in recent years. Such crises stigmatize a firm's reputation and present managers with challenges as PHCs can have significant short- and long-term economic consequences. Moreover, organization legitimacy and, by extension, managers' own career prospects, can be severely compromised by a PHC. Most prior studies investigate managers' strategies to deal with PHCs from marketing and communication perspectives.

We examine managers' reactions to PHCs from a financial reporting perspective. By investigating the consequences of such managerial actions, we attempt to make inferences about firms' financial reporting practices in PHCs as well as about the potential unethical and opportunistic nature of such practices. Consistent with firms' income-increasing financial reporting discretion in PHCs misleading customers' perceptions of the firms' ability to honor future implicit claims, we find that income-increasing earnings management helps crisis firms retain major customers in the short term. Such behavior also reduces the propensity for CEOs to undergo forced turnover. However, in the long run, firms and their stakeholders do suffer negative consequences in terms of a higher likelihood of financial restatement and worsened future operating performance if managers extensively manage earnings upwards in PHCs. The overall pattern is consistent with some managers engaging in unethical and deceptive financial reporting in PHCs.

Collectively, findings of this study document the implications of PHCs on firms' financial reporting behavior, and highlight the ethical dilemma faced by managers in PHC firms: seemingly pro-organizational behavior in the short run can still hurt the organization's long-term benefits. Our findings also show that better monitoring and greater ethical values embedded in the organization can mitigate such unethical financial reporting practices in PHCs. Our results suggest that auditors, regulators, directors, and investors may want to be especially alert for managers' financial reporting behavior in crisis circumstances.

Our findings need to be interpreted with some caveats in mind. First, since the KLD database does not reveal the exact dates of the PHCs, we are unable to perform more granular analyses to precisely map a PHC and related financial reporting at quarterly level. Future research might collect a more comprehensive dataset on the specific dates of PHC announcements and investigates the timing of earnings management surrounding the PHCs. Second, our study focuses on CEOs as product-related issues fall directly into the CEOs' responsibilities, which should in turn gives CEOs strong incentives to neutralize the negative impact of PHCs through earnings management. However, other top managers might also be influenced by the PHCs and the unethical financial reporting carried out in the PHCs. For instance, although PHCs are not directly related to CFOs, CEOs may coerce CFOs to manage earnings upwards. The interactions between CEOs and CFOs and how such interactions affect unethical financial reporting in the PHCs could be an avenue for future research.

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Compliance with Ethical Standards

Ethical Approval This article does not contain any studies with human participants or animals performed by any of the authors.

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