Does financial reporting misconduct pay off even when discovered?

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Abstract:

Experts and popular beliefs suggest that it pays to engage in financial misconduct due to lax enforcement and punishment after 2003. We focus on the most serious cases of financial reporting misconduct and hand collect data on three subsamples of severe misconduct cases, between 2003 and 2015: a sample of 37 (100) SEC enforcement actions (class action lawsuits) that explicitly allege fraud and a sample of 100 restatements with the most negative market reaction in which investors presumably suspect fraud. We then compare estimates of the benefits from the misconduct to top managers against estimates of the costs of its discovery. We find that 25.9% of perpetrators experience an overall net benefit from discovered misconduct. The percentage of officers who benefit is highest for the restatements sample (32.1%), followed by the class action lawsuits sample (24.1%), and is the lowest for the SEC enforcement sample (2.70%). Stated differently, if we assume that the probability of detection is 25% as conjectured in the prior literature, more than half (55%) of the perpetrators in our sample would rationally find it beneficial to engage in financial reporting misconduct. Hence, our evidence suggests that financial reporting misconduct can pay off for a significant portion of the perpetrators. We discuss several implications of our results to academics, practitioners and policymakers.

Keywords: misconduct, fraud, misreporting, penalty, cost benefit, SEC, restatements, class action lawsuits

JEL classification: G14; M40; M41

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1. Introduction

Does it pay to engage in financial misconduct, especially when it is eventually discovered? Echoing a strong popular belief, Phil Angelides, the former chairman of the Financial Crisis Inquiry Commission states the amount of penalty that executives' pay for financial misconduct is "akin to someone who robs a 7-Eleven, takes $1,000 and being able to settle for $25 with no admission of wrongdoing" (Angelides, 2013). Experts also point to a shift in enforcement and punishment priorities away from financial misconduct following the 9/11 terror attacks (Rackoff, 2014), enforcement litigation failures after 2003 (Eisinger, 2017) and the shift towards corporate deferred prosecution agreements in which individual executives are not prosecuted (Garrett, 2014). In Dichev et al. (2013), 60% of surveyed Chief Financial Officers believe that firms misreport because they believe that misreporting will go undetected. In a recent book, Eisinger (2017) uses numerous anecdotes and interviews to make a strong case that executives who commit financial misconduct get away too easily after 2003.

Empirical evidence from the period before 2003 suggests that perpetrators incur significant penalties. Karpoff, Lee, and Martin (2008) show that 93% of the individuals identified in the SEC and DOJ enforcement actions related to misconduct between 1978 and 2003 lose their jobs by the end of the regulatory period and also bear substantial financial losses via devalued stockholdings and SEC fines. Desai, Hogan, and Wilkins (2006), Arthaud-Day, Certo, Dalton, and Dalton (2006), and Hennes, Leone, and Miller (2008) find evidence of forced executive turnover and poor subsequent job prospects following restatements.

We are among the first to consider the period after 2003 which experts believe represents

a regime shift in the probability of getting caught and the level of punishment.[1] More important, none of these studies compares the costs of getting caught committing financial reporting misconduct to the benefits thereof, making it difficult to answer the question related to whether financial reporting misconduct pays off. Whether misconduct pays off unconditional on getting caught is perhaps impossible to answer because it requires unobservable information about perpetrators who never got caught. Nevertheless, we provide a preliminary answer to this question as well. To address these open issues, in this study, we compile a hand collected dataset of factors that determine both the costs and benefits of financial reporting misconduct after 2003 (2003-2015).

Following the definitions in Amiram et al. (2017), we use financial reporting misconduct as an umbrella term to capture financial reporting fraud, misrepresentation and misreporting. To keep costs of hand collected data manageable, we focus on cases with the most serious occurrences of financial reporting misconduct and identify three subsamples in which financial reporting fraud is explicitly alleged or is likely to have occurred. We identify our first misconduct subsample through explicit fraud allegations in SEC enforcement actions brought under either Section 17(a) of the 1933 Securities Act (fraudulent interstate transactions) or Section 10(b) of the 1934 Securities Exchange Act (manipulative and deceptive devices) (Karpoff et al., 2017). We identify our second misconduct subsample via explicit fraud allegations in securities class-action lawsuits that allege violations of SEC Rule 10b-5 (Dyck, Morse and Zingales, 2013). We use only the class action lawsuits with the most significant negative market reaction to eliminate trivial cases and potential frivolous lawsuits. We identify

[1] The Committee of Sponsoring Organizations of the Treadway Commission (COSO)'s fraudulent financial reporting analysis (2010) examines AAERs reported between 1998 and 2007. The report identifies some consequences for individuals allegedly involved in the misconduct, such as civil fines and job losses. However, it does not examine the personal benefits from engaging in these misconducts.

the final subsample by sorting on significant negative market reactions to restatement announcements. Despite the absence of explicit allegations, the significant decline in stock prices after the announcement of a restatement suggests that investors lose trust in the firm presumably because they believe that fraud or severe financial reporting misconduct has occurred (Dupont and Karpoff 2017).

Our sample selection procedures yield 37 cases from the SEC enforcement actions, 100 from each of the class action lawsuits and restatements associated with the most negative stock return when these lawsuits and restatements are announced. The cases in the three samples are not likely to be comparable.[2] The SEC enforcements sample contains cases that fit the SEC's unobservable objective function which might attract them to more egregious cases or cases that are easier to prosecute. The class action lawsuit sample is likely to contain cases that are projected to yield significant compensation to the plaintiff and the restatements sample is likely to contain cases where market participants suspect the occurrence of misconduct. Nevertheless, as discussed below, the differences in the costs and benefits across the three samples are informative.

For each case in each subsample, we hand collect data on the benefits from misconduct to include gains from performance-based compensation, stock and option trading gains, as well as unrealized gains from holding stock in the firm. Similarly, we gather data on the costs of getting caught, which include disgorgements and fines, loss through stockholdings at the firm upon revelation of the misconduct, as well as forgone earnings for perpetrators who lost their jobs. We add back "negative costs" such as the severance payment that perpetrators received upon

[2] By construction, our subsamples do not overlap with each other. As described in the sample selection table later in the paper, we exclude SEC enforcement cases from the lawsuit sample, and exclude SEC enforcement cases and lawsuits from the restatement sample.

resignation from their respective companies, and the earnings from any new job that perpetrators found afterwards. We then compare the benefits and costs for each perpetrator and examine the characteristics of perpetrators whose net benefits from misconduct are positive.[3]

The estimations of some of the elements of the costs and benefits require, at times, subjective judgments. When we do not have a strong reason to choose one assumption over the other, our decisions are based on what we believe yields a more conservative estimate (i.e., higher costs, lower benefits and as a result, higher likelihood that misconduct would not pay). Nevertheless, we intend to provide the metadata on each of the cases to the public, so others could revisit our judgments if they so desire. At the outset, we warn the reader to exercise caution when using our estimates. We expend great effort to be careful in constructing our estimates. Nevertheless, the task of estimating the costs and benefits of misconduct, while important, is inherently subjective and difficult.

Our estimates show that the average benefit to the perpetrators from misconduct is $10 million. The class action lawsuits subsample shows the highest amount of benefit, averaging $13.4 million. The average benefit for the SEC enforcement actions subsample is $5.3 million and that for the restatements subsample is $6.9 million. However, perpetrators bear even higher costs once misconduct is discovered. Upon initial revelation of misconduct, stock price drops by

[3] The following example illustrates the process that we use in each instance. One of the cases in our SEC enforcement sample involves OCZ Technology, Inc, where Chief Financial Officer Arthur Knapp was charged with accounting fraud. Knapp lost an estimated $7,089,827 of wealth through stockholding as OCZ's stock price dropped from a peak value of $10.6 during the violation period to $1.16 after the initial revelation of the misconduct. He also lost an estimated $403,767 of future earnings as his employment at OCZ was terminated. Moreover, he had to pay disgorgement and fines totaling $130,000. However, Knapp also derived certain benefits from his misconduct. His gain from incentive-based compensation during the violation period was $100,000. He earned a profit of $722,716 by trading stock and options before the revelation of the misconduct. He also gained $3,770,171 from his stockholding in OCZ as stock price increased during the period of inflated revenues. Netting the benefits off the costs result in an overall decrease in wealth of $3,551,552. In some other cases in our sample, the benefits from a misconduct even outweighs the costs of getting caught, resulting in an overall increase in wealth.

31% on average. We find that 39% of the perpetrators in our sample are fired upon revelation of misconduct. Of those fired, 64% find a new job, usually in small private companies, while the others appear to stay out of the labor market. The average cost of getting caught amounts to $26.7 million. The most notable costs are loss in wealth via stockholding and forgone earnings, suggesting that the stock market and the labor market are generally effective at punishing perpetrators. The class action lawsuits subsample reflects the highest cost, averaging $38.5 million, which is about three times the size of average benefit. The average cost for the SEC enforcements action subsample is $20 million, which is nearly four times the size of the average benefit, and that for the restatements subsample is $13.5 million which is about two times the size of the average benefit.

Although in most cases the costs exceed benefits, there exist a considerable number of perpetrators who profit from misconduct even after it is discovered. Specifically, 25.9% of the perpetrators in our sample (2.7% from the SEC sample, 24.1% from the lawsuits sample, and 32.1% from the restatements sample) experience an overall gain even after getting caught. Our analysis shows that these perpetrators are able to benefit mainly from lower forgone earnings and lower unrealized losses on their stockholdings. Only 7% of the perpetrators that experience overall gains are fired around the revelation of the misconduct. They also hold significantly less stock in their respective companies and are hence hurt less when the stock price plummets relative to perpetrators who suffer net losses.

To provide more evidence on whether misconduct generally pays off, we rely on an alternative way of presenting our results follows the spirit of Becker (1968) and Shapira and Zingales (2017). In particular, we construct a counterfactual, in which each perpetrator seeks to maximize his/her wealth, has rational expectations, and knows exactly the costs and benefits of

the misconduct that he/she perpetrated. We then ask, for how many of them would the misconduct be financially beneficial under different parameters of the probability of getting caught (probability of detection). For example, if we assume that the probability of detection is 25%, as estimated by Dyck et al. (2013), then more than a half (52%) of the perpetrators in our sample would rationally find it beneficial to commit misconduct. If we assume the probability of detection is 5%, this estimate is as high as 78% and as low as 28% if the probability of detection is 95%.

How would these findings affect our thinking about each individual manager's ex ante incentives to misreport? Because the average outcome is bad (i.e., we document negative net benefits), on average, the manager will draw an outcome in which she loses, a on net basis. The observation that 25.9% of the outcomes are positive suggests a 25.9% chance that the manager will have a positive outcome. Under this assumption, one way to interpret the results is to infer the system deters misreporting at the individual level, although risk-seeking managers are more likely to be willing to gamble and misreport because there is a 25.9% chance that their gamble will pay off. Whether the deterrence is ex ante optimal, and how much anyone – risk averse or not – is willing to cheat, will depend on the (unobserved) probability of getting caught and the gains and losses that are not measured (e.g., non-monetary rewards and costs). Viewed this way, our evidence on the cross-section of outcomes highlights how higher order moments, not just the average outcome, are likely to affect deterrence and misreporting.

Our effort is subject to four important limitations. First, as mentioned, the specific nature of misconduct cases pursued by each of the three enforcers in our sample (SEC, class action lawsuits and the stock market) are endogenous and subject to selection bias. Second, like most work on misconduct, we cannot comment on undetected misconduct. Third, we base our

estimates on a sample of misconduct cases. However, cost constraints limit our ability to investigate the entire universe of misconduct incidents. Finally, we ignore non-financial costs such as social disgrace associated with getting caught in misconduct.

Despite these limitations, our study contributes to the literature along several dimensions. Our main contribution is an attempt to better understand the cross-section of misconduct perpetration. Until now, most work has focused on, and draws inferences from, central tendencies of misconduct. However, each case of misconduct is idiosyncratic in that that it is difficult to infer much from any single case history. Our paper takes a middle road between focusing only on averages and anecdotes and by highlighting the distribution and cross-section of misconduct cases.

Besides the main contribution, we are perhaps the first in the literature to provide estimates that in 25% of the cases, misconduct does pay off even when discovered. We are also among the first to provide estimation of the costs and benefits of misconduct after 2003, where most studies so far focused on the pre-2003 period and that too only on the costs (e.g., Karpoff et al., 2008; Desai et al., 2006). These estimations contribute to our understanding of the alleged lax enforcement and punishment regime after 2003 (Eisenger, 2017). Lastly, we construct a detailed, hand-collected dataset that contains information on each of the elements of the costs and benefits of misconduct. We intend to make the data public to enable others to potentially improve our estimates and more importantly to answer future research questions.

2. Sample selection

As mentioned in the introduction, we compile three subsamples of serious misconduct cases: one collected from SEC enforcement actions, one from class action lawsuits, and another from severe accounting restatements. Table 1 details our selection criteria for each of SEC

enforcement actions, lawsuits, and restatements. The timeline for each subsample is presented in Appendix I. Details on the construction of each subsample are presented in the subsections below.

2.1 SEC enforcement actions sample

The SEC's website contains all SEC public releases relating to enforcement actions since September 19, 1995. We examine all the litigation releases and the administrative proceedings listed under the enforcement section. As shown in Table 1 Panel A, we found a total of 15,678 enforcement actions released between January 1, 2003 and December 31, 2016. We follow Karpoff et al. (2017) and require the defendants to be charged with fraud under section 10(b) of the 1934 Securities Exchange Act or section 17(a) of the 1933 Securities Act. Following this method, we identify 7,874 enforcement actions where defendants have been charged with fraud. Of all the enforcement actions released each year, on average 52.5% are alleged fraud cases.

Because we focus on financial reporting misconduct, we further restrict the sample to firms that violate one or more of the 13(b) or 13(a) provisions of the 1934 Securities Exchange Act. Section 13(b) requires firms to keep accurate book and records, mandates a system of internal accounting controls, and prohibits the knowing circumvention of internal control or knowing falsification of any accounting records. Section 13(a) requires the timely filing with the SEC of certain financial reports, including 10-K and 10-Q reports. Data in Table 1 Panel A shows that 1,548 enforcement actions in our sample period claim the violation of at least one of the 13(b) or 13(a) provisions. On average, 19.7% of alleged fraud cases released per year are related to financial reporting.

Next, we restrict the sample to cases where we can estimate the costs and benefits for the perpetrators. Because we can only obtain compensation and stockholding data for the top five highest paid executives in a company, we require each enforcement action in our sample to include at least one company executive as a defendant. A total of 1,069 enforcement actions satisfy this requirement. Of these, 989 cases have reached final judgment or settlement. We exclude ongoing cases because the nature and the magnitude of the associated penalty might change significantly in the enforcement process. We exclude misconduct cases that occurred before 2003. That filter leaves us with 200 cases. Of these cases, 134 have proxy statements on EDGAR but only 102 have stock price data on CRSP. After eliminating cases that were reported multiple times, we identify 53 unique enforcement actions.[4]

Next, we proceed to collect each perpetrator's name, job title, and age from the enforcement action filings. We exclude perpetrators who are being investigated by the Department of Justice because they could potentially be sentenced to jail and incur psychological costs that are impossible to estimate.[5] Nine out of the 116 perpetrators we identify through the enforcement action sample are being investigated by the DOJ and could potentially face a jail sentence. Of the 107 perpetrators who are not investigated by the DOJ, only 37 officers have compensation data on proxy statements and have been subject to a received final judgment.[6]

[4] An enforcement action is typically announced in both legal proceedings and administrative proceedings if they involve a trial or settlement.

[5] The Department of Justice has the authority to bring criminal charges, while the SEC is only authorized to bring civil enforcement actions against perpetrators. Fraud cases for which the SEC issued final judgments could still be under separate investigation by the DOJ.

[6] A company is required to disclose the compensation package for the top five most highly paid executives in its annual proxy statements. Because some of the perpetrators are not among the highest paid executives in their companies, their compensation is not available in the proxy statements.

Therefore, our final sample from SEC enforcement actions consists of 38 perpetrators from 27 unique firms.

2.2 Class action lawsuits sample

We capture private enforcement action from a sample of class action lawsuits. The sample selection procedure is described in Table 1 Panel B. The Audit Analytics Corporate and Legal database identifies 5,717 class action lawsuits for which the misconduct occurred during our sample period. Of those lawsuits, 2,258 cases have defendant information available on CRSP.

We follow Dyck, Morse and Zingales (2013) and identify severe misconduct cases using securities class-action lawsuits that allege fraud through violations of SEC Rule 10b-5. The very nature of class action lawsuits, where a group of investors jointly sues the company for causing their investment loss, implies that the company may have misstated or hidden certain financial information from investors. However, some lawsuits may be trivial or frivolous. To eliminate trivial cases, we sort the lawsuits by the stock return on the date a lawsuit was publicly announced (i.e. *exposure end date* in AA database, see Appendix I). Lawsuits with the most negative stock return are more likely to involve credible allegations that company's financial statements are materially misrepresented.

Next, we identify the 100 cases associated with the most negative announcement date returns.[7] We eliminate a case that is also being processed by the SEC or by the DOJ to retain our focus on private enforcement cases in this sub sample. We further restrict our sample to lawsuits

[7] Within the 100 lawsuits, 38 cases are settled, 18 are ongoing, and 48 are dismissed. We include dismissed cases in our sample because the extremely negative stock returns on the announcement date suggest that these lawsuits are likely to involve non-frivolous allegations. However, the dismissed status also suggests a lack of factual support for the allegation. If we restrict our sample to settled or ongoing lawsuits, the percentage of perpetrators who experience positive net wealth effect becomes 14.0%, as compared to 24.1% using the entire lawsuit sample.

that explicitly allege fraud by claiming a violation of SEC Rule 10b-5. Lastly, we require the availability of proxy statements for the defendant company on EDGAR. The 100 cases we chose are associated with an average abnormal return of -46.4% on the lawsuit announcement date. In contrast, the average announcement return for the class action lawsuit population is -5.10%.

We collect the name, job title, and age for each defendant in the lawsuit filings. The lawsuits typically name the CEO and CFO of a company as defendants, whose compensation is usually available from the proxy statement. Our final sample from class action lawsuits consists of 253 perpetrators from 100 unique firms.

2.3 Restatements sample

We attempt to capture the market's enforcement of severe misconduct by constructing a sample of the most negative market reactions to the announcement of a restatement. Karpoff and Dupont (2017) point out that the largest portion of loss in fraud cases is attributable to the breach of trust between the firm and the market. This loss is likely to occur regardless of whether the firm was formally accused as fraudulent in legal actions or not. Because regulators and investors would have identified and prosecuted cases according to their own objective functions, restatements without accompanying lawsuits, are likely to be associated with different characteristics relative to the other two samples.

The sample selection procedure is described in Table 1 Panel C. We obtain restatements from the Audit Analytics (AA) Non-Reliance Restatements database. The AA database identifies 11,677 restatements with the restatement period falling within our sample period. After removing restatements due to clerical error, merger and acquisition, or adjustment to mandatory rule

changes, we obtain 10,684 cases that involve financial reporting issues. Of these, 5,355 cases have data on CRSP.

As before, we sort restatements by stock return on the first date of public disclosure (i.e. *file date* in AA database, see Appendix I). We concentrate on cases with the most negative stock return and exclude cases that are being processed by the SEC or the DOJ or involved in a related class action lawsuit. Our final restatements sample includes 100 unique cases. The 100 cases chosen are associated with an average abnormal return of -16.2% on the restatement announcement date relative to the average return of -0.57% for the population of restatements.

Although restatements do not specify any person responsible for the misstatement, we assume that the CEO and CFO of the company are the perpetrators because the Sarbanes-Oxley Act of 2002 holds the CEO and CFO of a company personally liable for the accuracy and completeness of the company's financial statements. We collect each perpetrator's name, job title, and age from proxy statements on EDGAR and are left with a final sample of 209 perpetrators from 100 unique firms.

2.4 Sample description

Table 2 summarizes sample characteristics for the three subsamples: (i) the SEC sample with 27 unique cases and 37 perpetrators; (ii) the class action sample with 100 cases and 253 perpetrators; and (iii) the restatements sample with 100 cases and 209 perpetrators. The average violation period ranges from 657 days for the SEC enforcements sample to 420 days for the lawsuits sample. For the SEC enforcements sample, the initial revelation of a misconduct occurs 164 days on average after the violation period ends, consistent with Karpoff et al. (2008). The

average time gap between the end of violation period and initial revelation date is 100 days for the lawsuits sample and 216 days for the restatements sample respectively.

Firms in the lawsuits sample are, on average, significantly larger than those in the SEC enforcement sample. This is expected because private lawyers tend to target large firms with deeper pockets that are able to pay substantial settlements, whereas the SEC prosecutes both large and small firms (Cox et al., 2003). The restatement sample is populated by smaller firms as these are likely uninteresting to class action lawyers. Perpetrators in our sample are, on average, 50 years old. The average annual compensation and level of stockholding are significantly higher in the lawsuits sample, which is expected given that the lawsuits sample contains larger firms.

3. Measurement of the costs and benefits of financial reporting misconduct

A review of SEC enforcement actions and class action lawsuits filings suggests that the alleged motivations for managers to engage in misconduct include meeting analyst expectations, reaching internal performance targets, trading on insider information, or simply boosting the stock price of the company. Meeting internal performance targets would allow the perpetrators to gain performance-based compensation such as bonus and non-equity incentive compensation. Given a higher stock price in response to better financials, the perpetrator would also (i) benefit from trading stocks and options; and/or (ii) derive unrealized gains by simply holding shares in the firm while the stock price rises. Therefore, the benefits we estimate include gains in incentive compensation, stock and option trading gain, and gains in wealth via stockholding. We estimate the gains to the perpetrators as if the misconduct was never revealed, as these are the benefits that the perpetrators can expect to accrue if they had not been caught.

A perpetrator faces financial, reputational, and legal costs when the misconduct is

uncovered. Perpetrators who own stock in their companies may experience a loss in wealth because the public revelation of misconduct typically results in a sharp drop in the company's stock price. Moreover, they may be fired from the company and lose future earnings that they would receive if they continue to work at the same company. If perpetrators are able to find new jobs at another company, we count the new stream of earnings as a "negative cost" that reduces the perpetrator's forgone earnings. Lastly, perpetrators who are prosecuted by the SEC also have to pay disgorgement and fines. Therefore, the costs we estimate include loss in wealth via stockholding, forgone earnings, and disgorgement and fines.

To estimate the costs and benefits, we need to find the earliest date on which the misconduct was revealed to the public (thereafter referred to as "initial revelation date"), the period over which the violation occurred (thereafter referred to as "violation period"), as well as the job title, name, and age of the perpetrators (See Appendix I). For SEC enforcement actions, misconduct could be first revealed to the public through the firm's own 8-K filing, press release, or news articles. We hand-collect the initial revelation dates by looking for each respondent company's 8-K and 10-K for any disclosure of the SEC's informal investigation or non-reliance on past financials. We then search for news articles on misconduct or SEC investigation using the Lexis Nexis database. We consider the earliest of the relevant 8-K or 10-K filing dates and the date the news article was published as the initial revelation date. We hand-collect the violation period and perpetrator information from the enforcement action filings.

For class action lawsuits, we consider the end date of the violation period to be the initial revelation date (See Appendix I). The end of the violation period is typically characterized by a sharp decline in stock price which alerts the investors to presence of misconduct and to initiate the lawsuit. The end dates of violation periods (*exposure end date*) are available through the AA

Corporate and Legal database. We hand-collect the period of violation as well as perpetrator information from lawsuit filings on the Stanford Class Action Lawsuit Clearinghouse.

For restatements, we consider the first public announcement about a restatement to be the initial revelation date (See Appendix I). The initial disclosure dates (file date) are provided by the AA Non-Reliance Restatements database. The AA database also provides the restatement start and end dates, which marks the period over which the financials were restated. We use those dates to define the violation period. In the following subsections, we describe our estimates, assumptions, and data sources in greater detail.

3.1 Benefits of financial reporting misconduct

3.1.1 Performance based compensation

We estimate the amount of performance-based compensation that the perpetrators are only able to obtain after artificially inflating financial results to reach the internal/external performance targets. Under the assumption that the perpetrators would not have reached the targets without manipulating financial results, we estimate the gain in compensation using the sum of year-end bonus and non-equity incentive plan compensation over the violation period. We hand-collect compensation data from the sample companies' proxy statements on EDGAR.

3.1.2 Stock and option trading gains

Because a company's earnings are often overstated during the violation period, its stock price would be higher than it should have been if the financial results were not managed. Consequently, if a perpetrator sold stocks or options before the misconduct was discovered, his/her trading gain would be higher than the gain in the absence of misconduct. We need to

make a few assumptions to estimate the extra trading gains attributable to the inflated stock price. First, we assume that all stock owned by the perpetrators are restricted stock, and therefore the purchase price is zero. The purchase price of options is assumed to be the respective exercise price. Second, we assume that in the absence of any manipulation, the perpetrator would not sell any stock or option given the existing stock price, and therefore the trading gain foregone by the manager, absent misconduct, is zero. Relying on these assumptions, we use the entire observed trading profits as an estimate of the ill-gotten gain.

We calculate the profit from each trading transaction as the number of stock or option sold times the difference between the selling price and the purchase price. We then calculate each perpetrator's trading gain by aggregating the profits from all the transactions during the period after the misconduct began and before it was revealed. We obtain perpetrators' trading volume, stock selling price, option selling price, and option exercise price on a per transaction basis from the Thomson Reuters Insiders database. If a perpetrator's trading activities are not available on Thomson Reuters (195 out of 499 perpetrators), we assume that the perpetrator's trading gain is immaterial.

3.1.3 Gain in wealth via stockholding

Perpetrators also experience an increase in net wealth by holding stock in the company during the period when stock price was inflated, even if they do not actually sell their stock holding. To estimate wealth increases via their stockholding, we assume that a perpetrator held the same number of shares from the start of the violation period to the initial revelation date. Each perpetrator's stockholding is estimated using his/her stock ownership as disclosed in the

respective company's proxy statement closest to the initial revelation date.[8] We then identify the date on which the stock price reached a highest point during the period between the beginning of violation and the initial revelation date. The gain in wealth is estimated as the product of each perpetrator's stockholding (adjusted for stock splits) and the market adjusted return cumulated from one day before the violation began to the day when stock price peaked. We obtain stock prices from CRSP and hand-collect each perpetrator's stockholding from the latest proxy statement filed before the initial revelation date.

3.2 Costs of financial reporting misconduct

3.2.1 Loss in wealth via stockholding

The costs of financial reporting misconduct are determinable only after the misconduct is revealed to the public. A company's stock price would likely fall upon the revelation of the misconduct as the market adjusts the firm's valuation to reflect the firm's true fundamentals and the reputation loss associated with damaged trust in the company. Perpetrators who own shares in their respective companies will therefore suffer losses from their stockholdings due to stock price declines. Similar to Karpoff et al (2008), we estimate the loss in wealth via stockholding as the product of a perpetrator's stockholding (adjusted for stock split) and the market adjusted return cumulated from the date of the violation period's peak value to one day after the initial revelation date.

Each perpetrator's stockholding is estimated using his/her stock ownership as disclosed in the respective company's proxy statement closest to the initial revelation date. If a company was

[8] We use perpetrator's stockholding near the initial revelation date because it excludes the shares that perpetrators sold during the violation period. This avoids double-counting the trading gains.

delisted before the initial revelation date, we replace the revelation date price with the delisting price for the above calculations.

3.2.2 Forgone earnings

Perpetrators who were fired would lose future compensation that they would have earned had they not engaged in misconduct and instead had continued to work at the same companies. To calculate the amount of forgone earnings, we need to first determine whether a perpetrator is fired in connection with the misconduct incident, as opposed to voluntarily retiring from the company. This distinction is important because a few perpetrators might have intended to retire anyway and therefore would not have incurred any additional associated cost. We consider a perpetrator to be fired due to the misconduct event if the termination took place within (-1, +2) years around the initial revelation date.[9] Following Parrino (1997) and Jenter and Kanaan (2015), we classify departures as voluntary if the reason was reported to be death, poor health, or acceptance of another position in the same company, or if the perpetrator was above age 65 when the departure was announced.[10] For executives below the age of 65, a departure is classified as forced if either the press or 8-K reported that the executive had to be fired, or if the reports showed that the executive retired but did not announce the retirement at least six months before

[9] Prior studies have used different time windows around the event date to identify forced turnover. Hennes, Leone, and Miller (2008) find that the termination of executives starts half a year before the restatement date and the number of executives fired becomes constant around one year after the restatement date. Karpoff, Lee, and Martin (2008) document that the termination of executives takes place through the SEC enforcement process which lasts for 57 months on average. From Fig. 2 in their paper, most of the executives are terminated within (-1, +2) years surrounding the announcement date.

[10] Parrino (1997) and Jenter and Kanaan (2015) assume that turnover is voluntary if the executive was above the age of 60. We use age 65 as the cutoff in this study because many companies have mandatory retirement policies that require CEOs to retire at the age of 65.

the effective date. In a case where a company went bankrupt, the executive is classified as fired.[11]

For perpetrators who were fired, we estimate forgone earnings as the net present value of all future compensation they would receive had they worked at the company until an assumed retirement age of 65. To estimate future compensation, we assume that each perpetrator's total compensation grew at a constant rate each year. This growth rate is computed as the average inflation rate from 12/31/1996 to 12/29/2017, which amounts to 2.2%. Future compensation is discounted back to the year when a perpetrator's misconduct is first revealed to the public. We assume the discount rate to be 5.4%, which is equal to the average ten-year treasury bond maturity rate from 12/31/1996 to 12/29/2017. The rates of inflation and the ten-year treasury rates are obtained from CRSP treasury and inflation index database.

We hand-collect compensation for each perpetrator over the violation period from his/her company's proxy statements on EDGAR. For perpetrators who were fired, we collect compensation data for an additional three years prior to the violation period. This ensures that there are at least four data points that can be used for estimating their average annual compensation. If a perpetrator had not worked for the company prior to the misconduct event, we use the compensation for the previous executive at the same or similar job position as an estimate. We provide a detailed example of our estimation process in Appendix II.

3.2.3 Earnings from new jobs (a negative cost)

Some perpetrators find new jobs after separating from their previous companies, earning

[11] We classify an executive as fired in the case of bankruptcy because the executive would have lost his/her future earnings. Only six firms in our sample that went bankrupt after the misconduct was revealed.

compensation that partly offsets the costs of getting fired due to misconduct. We find each perpetrator's new job information on LinkedIn or Bloomberg. Perpetrators who do not report new jobs are assumed to be out of the job market and are therefore associated with no new earnings. Consistent with Desai et al. (2006), we find that perpetrators face poor job prospects after leaving their previous positions. Only 3.2% of perpetrators continue to work in public companies, while the rest either work for private companies or start their own businesses.

We make the following assumptions to facilitate our estimation of earnings from new jobs. First, we assume perpetrators will work in the same firm(s) until a retirement age of 65 unless they disclose that they have stopped working at that firm. Second, we assume that annual compensation in both public and private companies grows at rate of inflation which we assume to be 2.2%. We deliberately assume a lower growth rate for our estimate to be conservative.

We estimate earnings from new jobs by computing the net present value (discounted by the average 10-year treasury rate from 1996 to 2017) of all future compensation a perpetrator is supposed to receive from each new job, in the same way we estimate forgone earnings. If a perpetrator finds a position in a public company, we either collect his/her compensation information from the company's proxy statement or find the compensation for a comparable position through a Google search.[12] If a perpetrator starts work in a private company, we use the median annual compensation reported for each executive position in a 2014 survey conducted by Chief Executive Research.[13] For example, the median annual compensation is reported to be

[12] When estimating the new average annual compensation, we omit the first year the perpetrator starts working at the new public company because there is often an unusually high amount of bonus or option awards that will result in an overestimation of the new annual compensation.

[13] In *CEO & Senior Executive Compensation Report for Private Companies*, Chief Executive Research reports the survey results for 1,186 companies in April through June of 2015 about their 2014 fiscal year compensation levels

$360,000 for a CEO, $271,000 for a President, and $212,000 for a CFO. A detailed example of our estimation process is reported in Appendix II.

3.2.4 Disgorgement and fines

We hand-collect the amount of disgorgement and civil penalty from the SEC enforcement action filings. Some cases settle before proceeding to court. We assume that settlements are paid by the perpetrators' companies or are covered by their Directors and Officers insurance policies, and therefore the personal costs to perpetrators are zero. Similarly, we assume that perpetrators in our class action lawsuits sample will not need to pay fines because most of these lawsuits are settled and the companies or the D&O insurance pays for the settlement. Perpetrators in our restatement sample are not required to pay any fines.

4. Results

4.1 The costs and benefits of financial statements misconduct

We compute the benefits and costs of misconduct and go on to calculate the net wealth effect for each perpetrator as his/her total benefits minus total costs incurred. As per Table 3, the average benefit from misconduct amounts to $10,077,987, while the median is $907,960. A closer look suggests that perpetrators mainly gain from their stockholdings in the firms. The average gain via stockholding is $8,005,761 while the average gain in incentive compensation is only $602,801.

and practices.

Once the misconduct is discovered, however, perpetrators bear high costs that, on average, significantly outweigh the benefits. 39% of perpetrators lose their job within two years of the initial revelation date, resulting in average forgone earnings of $9,294,190, which is equal to more than four times a perpetrator's average annual compensation. Upon initial revelation of misconduct, stock price drops by 31% on average. Therefore, perpetrators who hold stock in their respective companies also suffer a large unrealized loss averaging $18,075,506. The average total cost of getting caught amounts to around $26,682,830, with a median of $4,436,592.

Table 3 Panel B reports that the benefits and costs are largest for the class action lawsuits sample, followed by the SEC enforcements sample, and are smallest for the restatements sample. This is because lawyers from private law firms tend to target large companies when they initiate a class action lawsuit because large companies are more likely to pay larger settlement amounts. The SEC, on the other hand, investigates misconduct in firms of varying sizes. As indicated in Table 2, the average firm size in the lawsuits sample is significantly larger than that in the SEC sample. Because perpetrators in larger companies tend to receive higher compensation, they experience larger losses of future earnings when they get fired. Table 3 Panel B also shows that the average forgone earnings are $14,051,050 for the lawsuits sample and $11,564,682 for the SEC enforcements sample. Similarly, the loss in wealth via stockholding amounts to an average of $25,517,888 for the lawsuits sample, much larger than $7,935,423 for the SEC enforcements sample. These data imply that the most severe penalty comes from the labor market and stock market.

4.2 The net wealth effect – does financial reporting misconduct pay for perpetrators even if it is discovered?

Table 4 shows that even though most perpetrators suffer an overall loss, some of them do experience a positive net wealth effect. Specifically, 2.7% in the SEC enforcement sample, 24.1% in the class action lawsuits sample, and 32.1% in the restatements sample experience a positive net wealth effect.[14] Overall, 129 out of 499 perpetrators (25.9%) in our sample gained from misconduct even after such misconduct is discovered. Therefore, the existing legal and market mechanisms still allow a considerable portion of perpetrators to gain from misconduct, especially when regulators are not involved.

4.3 Which executives benefit?

To answer this question, we begin by identifying any unusually high benefits or unusually low costs that lead to a positive net wealth effect. Table 5 shows the comparison of benefit and cost components between perpetrators who experience positive net wealth effects and those who experience negative net wealth effects. Across the three subsamples, forgone earnings are significantly lower for the perpetrators who eventually gain. This is because 93% of these perpetrators are not fired from their current companies. For the lawsuits and restatements samples, loss in wealth via stockholding is also significantly lower for perpetrators who experience positive wealth effects. The small losses stem from either systematically lower stockholdings or from a smaller drop in stock price upon the revelation of misconduct.

4.4 Counterfactual analysis – how many executives would gain from financial statement misconduct under different probability of detection thresholds?

[14] The few perpetrators who experience zero net wealth effect do not own stock in their companies, have not received incentive compensation during the violation period, and are not fired by the company due to the misconduct.

Thus far, the probability of getting caught in our sample is 100% by construction. However, if the probability of getting caught is lower than 100%, then more of the perpetrators, ex-ante, would have estimated that misconduct is beneficial. To provide further evidence on whether misconduct generally pays off, as opposed to only when the perpetrator gets caught, we use an alternative way to present our results follows the spirit of Becker (1968) and Shapira and Zingales (2017).[15] We construct a counter-factual, in which each perpetrator seeks to maximize his/her wealth and has rational expectations whereby he/she exactly knows the costs and benefits of the misconduct that he/she perpetrated. We go on to ask how many would consider misconduct to be beneficial under different rates of detection.

To illustrate, we assume that the probability of detection is 25%, as estimated by Dyck et al. (2014). Column (1) in Table 6 presents the results for the full sample. If the probability of detection is 25%, then more than a half (55%) of the executives in the sample would find it beneficial to engage in misconduct. If we assume the probability of detection to be 5% then this estimate is as high as 78% and as low as 28% if the probability of detection is set to 95%.

Column (2) in Table 6 presents the results for the SEC enforcement sample. If the probability of detection is 25%, then 22% of the executives in the SEC sample would find it beneficial to engage in misconduct. If we set the probability of detection to be 5%, then this estimate is as high as 70% and as low as 3% if the probability of detection is 95%.

5. Robustness tests

[15] Following Becker (1968), to derive the break-even probability of getting caught, we compare the expected benefit accruing to a manager from misconduct with the expected sanction. The expected sanction, in turn, is a function of the probability of getting caught and the magnitude of sanction imposed once the manager is caught.

While we expend great effort to carefully construct our estimates, our estimations inevitably involve subjective judgments. In this section, we try to mitigate some of these concerns by varying the assumptions used.

We first address the assumption that an increase in the value of a perpetrator's stockholdings during the violation period constitutes a gain even if the perpetrator did not sell any stock. One might argue that the stock appreciation did not actually turn into profits, therefore such unrealized gains should not be included in the estimation of net wealth effects. In Table 7 Panel A, we estimate net wealth effects without unrealized gains from stockholdings. Under this estimation, 14.2% of the perpetrators experience an overall net benefit. Specifically, none of the firms in the SEC enforcement sample, 15.8% of the lawsuit sample and 14.8% of the restatement sample experience positive net wealth effects.

Next, we assume that perpetrators received incentive payments during the violation period because of their misconduct. However, a skeptic could argue that a perpetrator would have earned part or all of the incentive payments even without engaging in misreporting, and those incentive payments should not be treated as gains stemming from misconduct. In Table 7 Panel B, we report net wealth effects estimated under the most conservative assumption that none of the incentive payments were attributable to misconduct. When the gains from incentive payments are excluded, 16.8% perpetrators still experience an overall net benefit. Specifically, 2.7% of the SEC enforcement sample, 13.8% of the lawsuit sample and 23.0% of the restatement sample experience positive net wealth effects.

Lastly, we estimate perpetrators' unrealized loss via stockholding as the decline in stock value from the peak during the violation period to one day after the initial revelation date. If stock price drops further upon additional announcements about the misconduct, our measure of

unrealized loss will be underestimated. To address this concern, we estimate unrealized losses over 90-day and 180-day periods after the initial revelation date, assuming that most of the additional announcements would be become public within 90-180 days and perpetrators' stockholding levels remain the same during this period.

In Table 7 Panel C, we show that 27.9% of the perpetrators experience an overall net gain if we estimate unrealized losses as the decline in value of their stockholdings from the peak price during violation to 90 days after the initial revelation date. For perpetrators in the SEC enforcement and the class action lawsuit samples who experience a net loss, the average and median net wealth effects are both more negative than those reported in our main results (Table 4). This finding implies that additional announcements indeed increase the size of unrealized losses for some of perpetrators especially if their firm faces a class action lawsuit. On the other hand, we find that a higher percentage of perpetrators experience positive net wealth effects compared to the 25.9% reported in our main analysis. For certain companies, the negative stock reaction to the revelation of misconduct does not persist in the long term and the stock price rebounds within 90 days after the initial revelation date.

In Table 7 Panel D, we show that if we estimate unrealized losses as the decline in value of their stockholdings from the peak price during the violation period to 180 days after the initial revelation date, 25.7% of the perpetrators experience an overall net gain. Specifically, 2.7% of the SEC enforcement sample, 24.1% of the lawsuit sample, and 31.6% of the restatement sample experience positive net wealth effects. The results are therefore relatively robust even if we extend the estimation period for unrealized losses to 180 days after the initial revelation date.

In Table 7 Panel E, we restrict new earnings to be equal to or less than forgone earnings. Specifically, for perpetrators whose new earnings exceed forgone earnings, we set their new

earnings equal to forgone earnings. Under this specification, 24.8% perpetrators experience a net gain, including 2.7% of the SEC enforcement sample, 22.5% of the lawsuit sample and 31.6% of the restatement sample.

6. Conclusions

Experts and popular commentators contend that it pays for executives to engage in financial misconduct, especially after 2003. A majority of surveyed CFOs believe that financial misrepresentation continues because the perpetrators believe that they will go undetected. Our paper provides evidence on this issue by quantifying the financial costs and benefits of engaging in financial reporting misconduct and getting discovered. We hand-collect data on perpetrators of financial reporting misconduct identified from SEC enforcement actions, class action lawsuits, and restatements between 2003 and 2015. We estimate their gains from misconduct, including gain in performance-based compensation, realized gain through stock and option trading, and gain in wealth stemming from appreciated stock prices on their equity ownership. We also estimate their costs of getting caught as forgone earnings minus earnings from new jobs, loss in stockholding on account of stock price drops when news of misconduct is revealed, as well as disgorgements and fines.

Our analysis shows that the average benefit from financial reporting misconduct is $10 million. However, perpetrators bear even higher costs once discovered. The average cost of getting caught amounts to $26.6 million. Thus, the average cost of getting caught is more than twice as large as the average benefits from misconduct. However, these average results gloss over significant cross-sectional variation in the sample. In particular, 25.9% of perpetrators experience an overall gain from misconduct even after getting caught. Specifically, 2.7% in the SEC enforcement sample, 24.1% in the class action lawsuits sample, and 32.1% in the

restatements sample experience a positive net wealth effect. Further analysis suggests that these perpetrators gain because they experience lower forgone earnings and loss in wealth via their stockholding in the firm.

We construct a counterfactual where each perpetrator seeks to maximize his/her wealth, has rational expectations, and correctly estimates the costs and benefits associated with the misconduct. We use each perpetrator's ex post benefits as a proxy for his/her expected benefits and use the product of ex post costs and the probability of getting caught as a proxy for his/her expected costs. If we assume that the probability of detection is 25% as estimated by Dyck et al. (2014), then more than a half (55%) of the perpetrators in our sample would rationally find it beneficial to engage in misconduct. If we assume the probability of detection is 5%, then this estimate is as high as 78% and as low as 28% if the probability of detection is 95%. Our investigation, subject to the caveats mentioned in the introduction, suggests that the popular view that that misconduct pays off is not entirely without merit as 25% of officers, on average, experienced net financial benefits from misconduct. Regulators might want to evaluate whether it is worth their time and effort to reduce the proportion of officers who seem to get away with misconduct.

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Table 1. Sample selection

Panel A. SEC enforcement sample

This table summarizes the process we use to identify financial statement misconduct cases with the required data available in the SEC sample. We start with all litigation releases and administrative proceedings released between 2003 and 2016 on the SEC website. Following the suggestion in Amiram et al (2017) and Karpoff et al (2017), we identify an SEC lawsuit filing as alleging fraud if the defendants are charged under section 10(b) of the 1934 Securities Exchange Act or section 17(a) of the 1933 Securities Act. Following Karpoff et al (2008). We require the SEC lawsuit filing to mention violation of one or more of the 13(b) or 13(a) provisions of the 1934 Securities Exchange Act. We also require individual executives, as opposed to the company, to be identified as defendants. We only include cases that have reached final judgment or settlement. We require the violation start date reported in each case to be during or after 2003 and that the companies in our sample to be available on EDGAR and CRSP. After obtaining 53 unique cases that satisfy all the above criteria, we collect the perpetrators named in each of these cases and exclude those who are under investigation by the DOJ since they may face jail sentence. The final sample consists of 37 individual perpetrators whose compensation data are available from the proxy statement.

Total number of SEC litigation release and administrative proceedings	15,678
Restrictions:	
Fraud allegation	7,874
"13(b)" or "13(a)" violations	1,548
Executives identified as defendants	1,069
Final judgment or settlement reached	989
Violation starts after 2003	199
EDGAR data available	134
CRSP data available	102
Unique cases	53
Number of perpetrators	116
Restrictions:	
Not under DOJ investigation	107
Compensation data available	37
Final sample	37

Panel B. Class action lawsuits

We identify misconduct cases for the class action lawsuits sample as follows. We collect class action lawsuits from Audit Analytics Corporate and Legal Database. Of the 5,717 cases that were released from 2003 to 2016, we found 2,258 cases with available stock return data on CRSP. In order to filter out trivial cases, we first sort all lawsuits based on the cumulative abnormal stock return on the first date the misconduct became publicly known (i.e. exposure end date in AA database). We retain 100 cases with the most negative stock return with available data on all the dimensions necessary for our analysis. We only examine lawsuits that involve violations starting after 2003. We exclude lawsuits that are being investigated by the SEC or DOJ. We identify a lawsuit as alleging fraud if the defendants are charged under SEC Rule 10b-5. All of the class action lawsuits in our sample allege financial misrepresentation or lack of disclosure and therefore are related to financial reporting. Lastly, we require the companies to be available on EDGAR. All perpetrators identified in the lawsuit filings have compensation data available in proxy statements.

Total number of lawsuits	5,717
Restrictions:	
CRSP data available	2,258
Collect 100 cases with the most negative stock returns	
Restrictions:	
Violation starts after 2003	
Not involved in SEC lawsuits	
Not under DOJ investigation	
Fraud allegation	
EDGAR data available	
Unique cases	100
Number of perpetrators:	253
Final sample	253

Panel C. Restatement

We collect data for the restatements sample from the Audit Analytics Non-Reliance Restatement database. The AA database identifies 11,677 cases that are filed between 2003 and 2016. After removing restatements due to clerical error, merger and acquisition, or adjustment to mandatory rule changes, we obtain 10,684 cases that involve financial reporting mistakes, out of which 5,355 cases have CRSP data available. In order to filter out trivial cases, we first sort all restatements based on the cumulative abnormal stock return on the first date the misconduct became publicly known (i.e. file date in AA database). We retain the 100 cases with the most negative stock returns with available data on all the dimensions necessary for our analysis. We only examine restatements that involve violations starting after 2003. We exclude restatements that are being investigated by the SEC or DOJ or have a related class action lawsuit. We identify CEO and CFO of sample companies as perpetrators, since they are required under SOX to be personally responsible for the accuracy and completeness of their companies' financial statements. We obtain their name, age, and compensation information from proxy statements on EDGAR.

Total number of restatements	11,677
Restrictions:	
Financial misrepresentation	10,684
CRSP data available	5,355
Collect 100 cases with the most negative stock returns	
Restrictions:	
Violation starts after 2003	
Not involved in SEC lawsuits	
Not under DOJ investigation	
Unique cases	100
Number of perpetrators:	209
Final sample	209

Table 2. Descriptive statistics

This table summarizes characteristics of the misconduct cases, the companies involved, as well as perpetrators in our sample. The length of violation period is measured in days. We also report the number of days from the end of violation period to the date when the misconduct first becomes publicly known. Total assets and market capitalization of a firm are measured in the year before the violation period begins, as these variables may be inflated during the violation period. The average annual compensation metric measures perpetrators' annual total compensation averaged over the violation period and three years prior to the start of violation. Stockholding is taken from the last proxy statement that is issued before the initial revelation date. Perpetrator age is measured in the year when the SEC enforcement action, lawsuit, or restatement is filed. The N in each column indicates the number of perpetrators. Misconduct and firm characteristics are measured at the firm level. The number of firms in the combined, SEC enforcement, lawsuit, and restatement samples are 227, 27, 100, and 100, respectively.

	Combined N = 499		SEC enforcement action N=37		Class action lawsuits N=253		Restatements N=209	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Fraud characteristics								
Length of violation period	484	365	657	546	420	375	497	364
Days till initial revelation date	164	127	223	167	100	34	216	156
Firm characteristics								
Total assets (million)	5,438	170	4,788	93	10,427	268	475	114
Market capitalization (million)	1,232	192	970	112	2,241	319	400	80
Perpetrator characteristics								
Age	50	49	49	48	50	49	50	50
Average annual compensation	2,056,915	726,122	990,802	529,361	2,868,953	1,114,446	1,262,660	466,875
Stockholding	1,352,884	220,088	1,063,947	139,184	1,542,343	272,307	1,174,689	148,100

Table 3. Summary of costs and benefits

Panel A. Summary for combined sample

This table summarizes our benefit and cost estimates for our combined sample. *Gain in compensation* measures the gain in performance-based compensation due to inflated financial performance and is estimated as the sum of bonus and non-equity incentive plan compensation over the violation period. *Trading gain* measures the realized gain from trading stock and options. *Gain via stockholding* measures the unrealized gain in wealth as the firm's stock price increases during the violation period and is estimated as a perpetrator's stockholding times the difference between the highest stock price during the violation period and the stock price one day before the violation begins. *Loss via stockholding* measures the unrealized loss in wealth as the firm's stock price drops upon revelation of the misconduct and is estimated as a perpetrator's stockholding times the difference between the highest stock price during the violation period and the stock price one day after the initial revelation date. *Forgone earnings* measure the loss in future earnings when a perpetrator is terminated due to the misconduct and is measured as the net present value of the perpetrator's expected future compensation. *New earnings* measures the amount of earnings a perpetrator is able to make from new jobs after leaving the misconduct firm, and is measured as the net present value of the perpetrator's expected future compensations in new firms. *Disgorgement and fine* is specific to the SEC enforcement action sample and is measured as the sum of disgorgements and civil penalties disclosed in the SEC filings.

	Combined N=499	
	Mean	Median
Gain in compensation	602,801	117,000
Trading gain	1,469,425	0
Gain via stockholding	8,005,761	399,677
Total benefits	10,077,987	907,960
Loss via stockholding	18,075,506	1,404,547
Forgone earnings	9,294,190	0
New earnings	818,727	0
Disgorgement and fine	131,860	0
Total costs	26,682,830	4,436,592
Net wealth effect	-16,604,842	-1,789,509

Panel B. Summary by subsamples

This table summarizes our benefit and cost estimates for the three subsamples separately. Variable definitions are the same as those in Panel A.

	SEC enforcement actions N=37		Class action lawsuits N=253		Restatements N=209	
	Mean	Median	Mean	Median	Mean	Median
Gain in compensation	546,548	100,673	911,052	225,000	239,614	48,000
Trading gain	685,712	0	2,497,198	0	364,023	0
Gain via stockholding	4,105,441	201,672	9,997,216	876,698	6,285,539	199,929
Total benefits	5,337,701	598,993	13,405,466	1,853,214	6,889,176	394,918
Loss via stockholding	7,935,423	625,661	25,517,888	2,766,946	10,861,442	567,778
Forgone earnings	11,564,682	6,089,024	14,051,050	0	3,133,931	0
New earnings	1,228,625	0	1,049,167	0	467,206	0
Disgorgement and fine	1,778,331	85,000	0	0	0	0
Total costs	20,049,811	7,303,237	38,519,771	7,246,292	13,528,167	1,511,670
Net wealth effect	-14,712,110	-6,164,024	-25,114,305	-3,735,691	-6,638,991	-300,882

Table 4. Summary of net wealth effect

This table reports positive and negative net wealth effects for each subsample respectively. *Net wealth effect* is defined as the total benefits from engaging in misconduct minus the overall costs from getting caught. A positive net wealth effect suggests that misconduct pays off economically for the perpetrator. A negative net wealth effect, on the other hand, suggests that costs of getting caught outweigh the benefits for the perpetrator.

	Positive net wealth effect				Negative net wealth effect			
	N	% positive	Mean	Median	N	% negative	Mean	Median
SEC enforcement	1	2.7%	155,737	155,737	36	97.3%	-15,125,105	-6,245,503
Class action lawsuit	61	24.1%	4,275,759	912,475	192	75.9%	-34,451,772	-7,550,985
Restatement	67	32.1%	4,548,535	711,119	142	67.9%	-11,917,614	-1,576,089

Table 5. Comparison between perpetrators with positive and negative net wealth effects

This table compares benefits and costs for perpetrators who experience positive net wealth effects to those who experience negative net wealth effects. The differences in the means column presents p-values of the unpaired T-tests for each benefit and cost components The differences in the medians column presents p-values of the Wilcoxon rank sum test for each benefit and cost components.

		Perpetrators with positive net wealth effect			Perpetrators with negative net wealth effect			Differences in the means	Differences in the medians
	Variable	**N**	**Mean**	**Median**	N	**Mean**	**Median**	**p-value**	**p-value**
SEC enforcement	Gain in compensation	1	0	0	36	561,730	106,587	0.000	0.202
	Trading gain	1	0	0	36	704,760	0	0.051	0.603
	Gain via stockholding	1	856,398	856,398	36	4,195,692	145,743	0.063	0.572
	Loss via stockholding	1	625,661	625,661	36	8,138,471	777,683	0.047	1.000
	Forgone earnings	1	0	0	36	11,885,923	6,571,756	0.000	0.092
	New earnings	1	0	0	36	1,262,753	0	0.000	0.407
	Disgorgement and fine	1	75,000	75,000	36	1,825,646	92,500	0.102	0.814
	Total benefits	1	856,398	856,398	36	5,462,182	575,089	0.033	0.779
	Total costs	1	700,661	700,661	36	20,587,288	7,748,838	0.001	0.092
Class action lawsuit	Gain in compensation	61	762,539	351,000	192	958,236	201,063	0.231	0.011
	Trading gain	61	2,924,973	0	192	2,361,291	0	0.340	0.130
	Gain via stockholding	61	4,011,939	306,960	192	11,898,789	1,033,855	0.035	0.158
	Loss via stockholding	61	3,904,998	993,356	192	32,384,484	3,375,542	0.000	0.000
	Forgone earnings	61	1,018,828	0	192	18,191,496	0	0.000	0.000
	New earnings	61	1,500,134	0	192	905,892	0	0.219	0.001
	Total benefits	61	7,699,451	2,440,701	192	15,218,315	1,828,004	0.067	0.552
	Total costs	61	3,423,692	469,806	192	49,670,088	10,705,596	0.000	0.000

Restatement	Gain in compensation	67	488,352	135,000	142	122,252	16,250	0.006	0.000
	Trading gain	67	1,093,020	0	142	20,059	0	0.040	0.000
	Gain via stockholding	67	8,036,920	489,126	142	5,459,230	112,663	0.252	0.002
	Loss via stockholding	67	4,670,564	399,586	142	13,782,491	643,852	0.038	0.230
	Forgone earnings	67	537,233	0	142	4,359,134	0	0.000	0.001
	New earnings	67	138,140	0	142	622,470	0	0.001	0.000
	Total benefits	67	9,618,192	1,285,234	142	5,601,541	288,826	0.155	0.000
	Total costs	67	5,069,657	399,586	142	17,519,154	2,128,172	0.009	0.000

Table 6. Counterfactual analysis – how many executives would gain from misconduct under different probability of detection thresholds

In this table, we present a counterfactual scenario where each perpetrator seeks to maximize his/her wealth, has rational expectations, and correctly estimates the costs and benefits associated with the misconduct. We use each perpetrator's ex post benefits as a proxy for his/her expected benefits and use the product of ex post costs and the probability of getting caught as a proxy for his/her expected costs. This table shows the percentage of perpetrators who would benefit from misconduct under different assumptions of the probability of getting caught. We show results for the full sample and each subsample.

Probability of detection	Full sample	SEC enforcement action	Class action lawsuit	Restatement
5%	78%	70%	79%	78%
15%	63%	35%	67%	63%
25%	55%	22%	59%	55%
35%	47%	14%	49%	51%
45%	43%	11%	42%	49%
55%	40%	8%	39%	46%
65%	36%	5%	35%	42%
75%	32%	3%	29%	40%
85%	29%	3%	28%	36%
95%	28%	3%	26%	35%

Table 7. Robustness tests

Panel A. Excluding unrealized gains via stockholding

This table reports positive and negative net wealth effects excluding unrealized gains via stockholding.

	Positive net wealth effect				Negative net wealth effect			
	N	% positive	Mean	Median	N	% negative	Mean	Median
SEC enforcement	0	0.0%	-	-	37	100.0%	-18,817,550	-7,303,237
Class action lawsuit	40	15.8%	3,345,917	519,147	213	84.2%	-42,333,576	-9,025,690
Restatement	31	14.8%	1,225,478	268,235	178	85.2%	-15,388,859	-1,843,826

Panel B. Excluding incentive payments

This table reports positive and negative net wealth effects excluding incentive payments (i.e. bonus and non-equity incentive compensation).

	Positive net wealth effect				Negative net wealth effect			
	N	% positive	Mean	Median	N	% negative	Mean	Median
SEC enforcement	1	2.7%	155,737	155,737	36	97.3%	-15,686,835	-6,295,839
Class action lawsuit	35	13.8%	6,374,099	1,923,821	218	86.2%	-31,227,106	-5,756,040
Restatement	48	23.0%	5,786,452	1,144,117	161	77.0%	-10,654,524	-1,289,691

Panel C. Estimating unrealized losses via stockholding till 90 days after initial revelation date

In this table, we estimate unrealized losses via stockholding from the day when stock price peaks during the violation period to 90 days after the initial revelation date.

	Positive net wealth effect				Negative net wealth effect			
	N	% positive	Mean	Median	N	% negative	Mean	Median
SEC enforcement	2	5.4%	10,007,492	10,007,492	35	94.6%	-16,068,764	-6,362,192
Class action lawsuit	67	26.5%	4,297,986	988,236	186	73.5%	-36,048,516	-7,839,041
Restatement	70	33.5%	3,694,952	479,471	139	66.5%	-12,146,591	-1,556,882

Panel D. Estimating unrealized losses via stockholding till 180 days after initial revelation date

In this table, we estimate unrealized losses via stockholding from the day when stock price peaks during the violation period to 180 days after the initial revelation date.

	Positive net wealth effect				Negative net wealth effect			
	N	% positive	Mean	Median	N	% negative	Mean	Median
SEC enforcement	1	2.7%	211,439	211,439	36	97.3%	-15,679,915	-6,486,236
Class action lawsuit	61	24.1%	4,276,083	1,222,006	192	75.9%	-36,987,668	-8,020,567
Restatement	66	31.6%	6,057,180	462,835	143	68.4%	-11,569,011	-1,658,262

Panel E. Restricting new earnings to equal or less than forgone earnings

In this table, we set new earnings equal to forgone earnings if the former exceeds the latter and recalculate net wealth effect. In other words, we restrict new earnings to be equal or less than forgone earnings.

	Positive net wealth effect				Negative net wealth effect			
	N	% positive	Mean	Median	N	% negative	Mean	Median
SEC enforcement	1	2.7%	155,737	155,737	36	97.3%	-15,125,105	-6,245,503
Class action lawsuit	57	22.5%	4,170,937	799,788	196	77.5%	-33,799,592	-6,931,870
Restatement	66	31.6%	4,612,247	734,240	143	68.4%	-11,834,412	-1,557,810

Appendix I

We present the timeline of a SEC enforcement action, a class action lawsuit, and a restatement respectively. We focus on identifying the initial revelation date of misconduct and the violation period, which are needed for the estimation of benefits and costs.

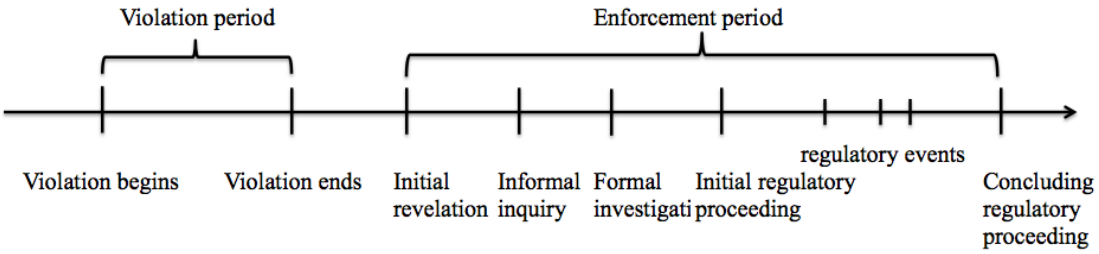

Fig. 1. Timeline of an enforcement action

Fig.1 outlines the sequence of events for a SEC enforcement action. We define the initial revelation of misconduct as the first public announcement of a potential problem (Karpoff et al [2008]). Common examples include disclosure of SEC informal inquiry or investigation by the firm or media, short seller presentation alleging misconduct, or other events identified in the enforcement action. In Fig. 1, initial revelation can sometimes overlap with informal inquiry or formal investigation. Following the initial revelation, the SEC proceeds to investigate the misconduct firm and engage in a series of regulatory proceedings until the case reaches final judgment or settlement.

We hand-collect initial revelation dates and violation periods from SEC enforcement action filings. In cases when the initial revelation dates are not readily available, we search the firm's 8-K, 10-K, and 10-Q filings and search LexisNexis to find any news article about the misconduct. We take the earliest date of the above search results to be the initial revelation date.

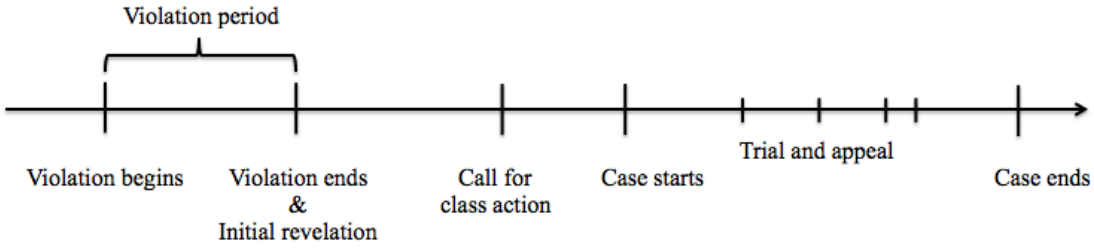

Fig. 2. Timeline of a class action lawsuit

Fig. 2 depicts the sequence of events for a class action lawsuit. A class action lawsuit is usually triggered by a large and sudden drop in stock price which often reveals a potential fraud. Therefore, the initial revelation date is the same as the violation end date. The AA database provides the start and end dates of the violation. The violation end date (termed *exposure end date* in the database) as the "end of the class period in a securities class action, typically when the wrongdoing becomes public knowledge." The violation begin date (termed *exposure start date* in the database) is defined as the "beginning of class period in a securities class action, typically the date the nondisclosure or misconduct on the market occurred."

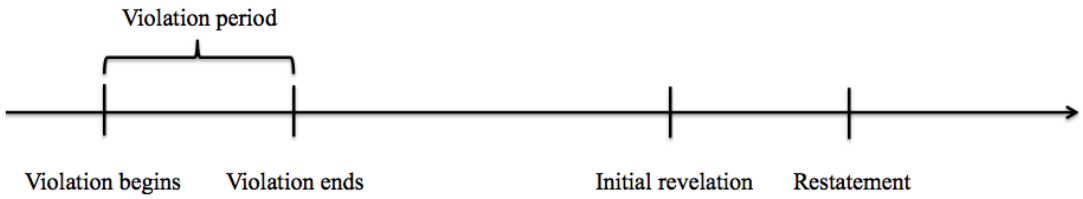

Fig. 3. Timeline of a restatement

Fig. 3 presents the sequence of events for a restatement. Upon discovering a mistake, companies usually make an announcement about the accounting issue in 8-K or other forms before restating the financials. The initial revelation date (termed as *file date*) in the AA database identifies the first date on which the mistake is announced to the public. The AA database also provides the period over which the company is restating. We use the beginning and ending of the restated period (termed *res begin date* and *res end date* in the database) to identify the violation period.

Appendix II

We illustrate our estimation process by describing how we estimate the benefits and costs for a particular perpetrator. Consider Authur Knapp, the former CFO of OCZ Technology Group, Inc.

Knapp was named as respondent in a SEC enforcement action. He was charged with violating antifraud provisions including Section 17(a) of the Securities Act, and with aiding and abetting OCZ's violation of the reporting, books and records, and internal control provisions including Section 13(b)(2) of the Exchange Act. The SEC alleged that Knapp caused OCZ to report materially inflated revenues and gross profits from 2010 to 2012. Specifically, he reclassified costs of goods sold as research and development expenses, excluded labor and overhead costs from inventory costs, recognized revenues upon product shipment rather than upon delivery, and understated OCZ's accruals for product returns.

According to the SEC enforcement action, the violation began from 05/31/2010 and ended on 05/31/2012. The misconduct was first revealed on 11/21/2012, when OCZ disclosed in an 8-K that the SEC was conducting an investigation on the company. Between the starting date and the revelation date of the misconduct, OCZ's stock price increased from the $3.69 on the trading day prior to the start of violation to a peak value of $10.6 on 07/14/2011 as shown in Fig.4.

Fig.4. OCZ's stock price before the revelation of misconduct

By the first trading day after the initial revelation of the misconduct, OCZ's stock price had fallen to $1.16. Knapp's employment at OCZ was terminated on 03/25/2013, within two years of the initial revelation date. Our LinkedIn search result shows that Knapp worked as part-time CFO at a private technology consulting company from 2013 to present.

Benefits:

Gain from performance-based compensation

Bonus and non-equity incentive compensation over the violation period sums up to $100,000.

Trading gains

We calculate trading gains from selling stock or options in the period after the misconduct began and before the initial revelation date. Using data from Thomson Financials, we find that Knapp's trading gain is $772,716.

Gain via stockholding

The number of shares beneficially owned by Knapp is 748,117 as disclosed in the last proxy statement issued prior to the initial revelation date. We assume his holding stays constant throughout the violation period.

We accumulate the stock return from 05/28/2010 to 07/14/2011 when OCZ's stock price reached the highest price before the misconduct was discovered. Knapp's gain via stockholding is computed as the market adjusted cumulative stock return times 748,117, which yields $3,770,171.

Costs:

Loss via stockholding

We accumulate the stock return from 07/14/2011 to 11/23/2012 when OCZ's stock price dropped from the peak price to the price one trading day after the initial revelation date. Knapp's loss via stockholding is computed as the market adjusted cumulative stock return times 748,117, which yields a loss of $7,089,827.

Forgone earnings

When Knapp left OCZ in 2013, he was at age 64, which is two years before retirement assuming he would retire at age 65. Therefore we consider two years of future earnings at OCZ to be forgone.

We calculate average annual compensation by summing all the components in the summary compensation table for each year. We average such compensation over five years (i.e. from two years before the violation began to the end of violation period). Ideally we would calculate the

average of annual compensations from three years before to the end of the violation period, but in this case only two years were available). The average annual compensation is $403,767 in Knapp's case.

We assume a compensation growth rate of 2.2%, which is equal to the average inflation rate from 12/31/1996 to 12/29/2017. We assume a discount rate of 5.4%, which is equal to the average ten year treasury bond maturity rate from 12/31/1996 to 12/29/2017. We assume that Knapp would have receive a severance package equal to the compensation in his last working year if he had not been fired due to his misconduct.

Taking the net present value of Knapp's stream of future income until age 65, his forgone earnings is estimated to be $1,186,613.

New earnings

After leaving OCZ, Knapp started to work as part-time CFO at a private technology consulting firm from 2013 to present. To be consistent with the forgone earnings calculation, we only include new earnings he earned up to the year when he reached age 65. His annual compensation is assumed to be $212,000, based on the median salary for private company CFOs as reported in *CEO & Senior Executive Compensation Report for Private Companies* by Chief Executive Research in 2014. Using the same method of calculating net present value, we estimate Knapp's new earnings to be $212,000.

Disgorgement and fines

The SEC ordered Knapp to pay disgorgement of $100,000 and civil penalty of $30,000. Both add to the costs of getting caught.

Netting the benefits off costs, Knapp's net wealth effect from committing fraud is -$3,551,552.