A Critical Analysis of Databases Used in Financial Misconduct Research

Jonathan M. Karpoff
Professor of Finance
University of Washington
karpoff@uw.edu

Allison Koester
Assistant Professor of Accounting
Georgetown University
apk29@georgetown.edu

D. Scott Lee
Professor of Finance
Texas A&M University
slee@tamu.edu

Gerald S. Martin
Associate Professor of Finance
American University
gmartin@american.edu

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Abstract

The electronic availability of data on financial restatements, class action lawsuits, and regulatory actions has facilitated significant advances in our understanding of the causes and effects of financial misconduct. Nearly 100 published studies examining aspects of financial misconduct rely on data from one of four publicly available databases: the Government Accountability Office (GAO) and Audit Analytics (AA) databases of restatement announcements, the Securities Class Action Clearinghouse (SCAC) database of securities class action lawsuits, and the Securities and Exchange Commission’s series of Accounting and Auditing Enforcement Releases (AAERs). In this paper we describe and document five types of potential problems in these databases that, if not recognized and addressed, can affect the validity and interpretation of empirical findings in this area.

The first potential problem is that each database typically misidentifies the initial event upon which news of the misconduct is revealed to the public. The average date staleness ranges from 150 calendar days (for the SCAC database) to 1,017 days (for the AAER data series). Second, the events in each database capture an average of only 6% to 36% of the value-relevant information that pertains to a given case of misconduct. Third, these databases suffer from high rates of error of omission. For example, the GAO database omits 31% of the cases of material misrepresentation during the time period it covers and for which the firm issued one or more restatement announcements; even for the cases of misconduct that the database correctly identifies, it omits 53% of the relevant restatement announcements. Fourth, each database contains duplicate events for the same underlying instance of misconduct, which can induce problems from lack of independence or exacerbate the incomplete information problem. Finally, each database contains many events that are unrelated to financial misconduct. Whether any particular event should be included in a sample depends on the researcher’s objective. However, we show that for some simple criteria (e.g., does this identify a case of financial fraud?), the rate of false positives ranges from 31% (for the AAER data series) to 98% (for the AA database).

Whether these database features pose material challenges for a research study depends on the particular research question. We show, however, that the potential for error is economically significant. In event studies, the stale date problem alone causes these databases to understate the average loss in share value when misconduct is revealed by 56% to 73%. We conclude with suggestions for how to minimize the potential for data-related error in future research.
1. Introduction

The electronic availability of data on financial restatements, class action lawsuits, and regulatory actions has facilitated significant advances in our understanding of the causes and effects of financial misconduct.\textsuperscript{1} Four of the most commonly used databases are the Government Accountability Office (GAO) and Audit Analytics (AA) databases of restatement announcements, the Securities Class Action Clearinghouse (SCAC) database of securities class action lawsuits, and the Securities and Exchange Commission’s Accounting and Auditing Enforcement Releases (AAERs). These four databases play a prominent role in academic research related to financial reporting, corporate governance, market efficiency, and the optimal role of government oversight of financial markets. Appendix A lists nearly 100 research papers published in prominent finance and accounting research journals that use data from one or more of these sources. Table 1 provides a brief overview of these databases, and Appendix B provides a detailed description of each database. These databases all share features that pose unique challenges for researchers that, if not properly addressed, can lead to data errors and misspecified tests.

In this paper we identify and measure the importance of five types of potential problems that researchers must take care to avoid. These five potential problems involve (1) stale initial revelation dates, (2) scope limitations, (3) omissions, (4) duplicate events, and (5) false positives. This paper describes each potential problem, documents the extent to which it arises in each of the four databases, and measures the economic importance of the potential problems in each database. To document these problems and their economic importance, we compare the cases

\textsuperscript{1} For examples, see Dyck et al. (2010), Graham et al. (2008), and Gande and Lewis (2009). We use the term “financial misconduct” to refer to instances in which firm managers provide incorrect or materially incomplete financial information. Not all researchers who use these four databases investigate misconduct or allege that the events captured by these databases involve misconduct. Nevertheless, the potential problems we describe generally apply to alternative uses of these databases.
identified by each database to 1,099 cases in which the SEC brought regulatory action for financial misrepresentation from 1978 – 2011. By combining the databases and adding hand-collected information, we compile a relatively complete record of 10,415 unique information events – including press releases, restatement announcements, lawsuit filings, and regulatory releases – that pertain to these 1,099 cases of financial misrepresentation.\(^2\) We refer to this combined database as the Federal Securities Regulation (FSR) database, and use it as a benchmark with which to measure the extent of the potential problems in the GAO, AA, SCAC, and AAER databases.

The first potential problem – staleness in the initial revelation dates – arises because few of the events in these databases identify the initial public release of information about the case of financial misconduct. This poses a challenge for researchers seeking to measure the share price reactions to news of misconduct. In this dimension, the SCAC database fares best, with an average lag of 150 days between the initial announcement of misconduct and the filing of the class action lawsuit, followed by the GAO database (mean lag of 187 days), then the AA database (242 days), and the AAER data series (1,017 days). Not surprisingly, the use of stale announcement dates can have a material effect on research findings. Using an event study research design, we show that relying on the event dates in any one of these databases causes a researcher to underestimate the negative impact of the initial revelation of misconduct on share values by amounts that range between 56% (for the GAO database) to 73% (for the AAER database).

\(^2\) Note that each case of financial misrepresentation typically involves multiple events. The events include restatement announcements, securities class action filings, and regulatory actions, as well as news reports, press announcements, and regulatory filings. When measuring the magnitudes of the potential errors, we assume that a conscientious researcher would also combine related events into unique cases. Our procedure for combining events into cases is described in detail below.
The second potential problem arises because none of the databases are designed to capture the full range of public announcements that surround an alleged case of misconduct. Among the restatements in the GAO database that are associated with cases of financial misrepresentation, the GAO-identified restatements account for only 9.8% of the events through which public announcements conveyed important incremental information about the misrepresentation or the consequences to the firm. The AA database identifies 8.7% of the potentially relevant announcements for the cases it identifies. The corresponding percentage is 5.9% for samples that rely on the SCAC database and 36.2% for samples that rely upon AAERs. Such gaps in coverage can affect how researchers classify and use these data, and also the measured magnitude of the misconduct. Using share price reactions to measure the value-relevance of information, the average amount of value-relevant information that is missed ranges from 64% (for the AAER database) to 94% (for the SCAC database).

The third type of potential problem arises because all of these databases omit many events and cases that presumably should be included. To document the size of the omitted events problem, we compare the events in the GAO, AA, SCAC, and AAER databases to the more complete set of records in the combined FSR database. There are two important types of error of omission. First, each database omits relevant “same type” events (e.g., the GAO and AA databases omit restatement announcements, the SCAC database omits securities class action lawsuits, and the AAER data series omits SEC regulatory actions) within the cases of misconduct each database correctly identifies. The GAO restatement database, for example, focuses only on restatement announcements, yet it omits 52.8% of the restatement announcements with important incremental information that pertain to the cases of misconduct the database identifies. The AA database contains many more restatement announcement events relative to the GAO database (e.g., 11,001 versus 2,707), yet the AA database misses 62.3% of the incremental restatement
announcements that pertain to the cases of misconduct that it identifies. Similarly, the SCAC database omits 8.5% of the securities class action filings that pertain to the cases of misconduct the database identifies, and the AAER database misses 43.3% of the regulatory releases relating to the cases of misconduct it identifies.

The second type of error of omission is that each database misses important cases of financial misrepresentation – all of which prompted SEC enforcement action – *within its own sampling design and time period*. The GAO database, for example, correctly identifies one or more restatement announcements for each of 290 separate cases of financial misrepresentation that triggered SEC sanctions during its 1997 – June 30, 2006 coverage interval. However, the database completely misses an additional 127 cases of financial misrepresentation that triggered SEC sanctions for misrepresentation and in which one or more restatements were issued during the 1997 – June 30, 2006 time period. This is an omission rate of 30.5%. The comparable omission rate is 9.4% for the SCAC database, 14.6% for the AAER database, and 53.9% for the AA database.

Errors of omission pose two challenges for researchers: they contribute to small samples and can bias tests that rely on control samples. Researchers frequently construct control samples from the set of firms that do not appear in the GAO, AA, SCAC, or AAER databases. But to the extent that the database does not correctly identify firms with material restatements, lawsuits, or SEC releases, the control samples will include firms that should be in the financial misconduct (i.e., treatment) sample. Some readers might contend that errors of omission simply contribute to low power tests, biasing against the researcher finding his hypothesized result. However, as Burgstahler (1987) points out, “… hypothesis tests with low power are not only undesirable *ex ante* (because of the low probability of observing significant results) but also *ex post* (because
little probability revision should be induced even when significant results are observed)” (p. 203).

The fourth type of potential problem is that the databases all contain duplicate, or follow-on, events that pertain to the same instance of misconduct. In the AA database, for example, 40.9% of the restatement announcements are duplicates in the sense that they relate to the same underlying occurrence of financial misconduct as a prior restatement announcement in the database. The corresponding rate of duplication is 25.1% for the GAO database, 15.7% for the SCAC database, and 84.6% for the AAER database. A researcher who treats these events as independent instances of misconduct will have biased test statistics. Many researchers avoid this problem by discarding duplicate events. But this practice can exacerbate the scope limitation problem described above, because it ignores the additional information contained in follow-on events.

A fifth type of potential problem arises because the databases contain many events that most researchers seek to exclude from their samples. For example, Hennes et al. (2008) argue that 73.2% of the events in the GAO restatement database involve technical restatements as opposed to irregularities. For researchers seeking to identify cases of financial misconduct, this implies that 73.2% of the GAO events are false positives and that these restatement announcements should not be included in a researcher's sample.

Whether an event should or should not be included in a sample depends on the researcher’s objective, so it is not possible to provide exact counts of false positives that apply to all research questions. Nonetheless, we provide measures of the rate of false positives for two criteria that are appropriate for many research questions. The first criterion identifies an event as a correct positive if it is associated with conduct for which the SEC brings enforcement action for misrepresentation. Using this criterion, the rate of false positives is 97.8% for the AA
database, 88.6% for the SCAC database, 84.2% for the GAO database, and 19.7% for the AAER database. The second criterion identifies an event as a correct positive if the conduct prompted at least one charge of financial fraud. Using this criterion, the false positives rate is 98.1% in the AA database, 90.4% in the SCAC database, 89.4% in the GAO database, and 46.2% in the AAER database. Using either criterion, the false positive events are associated with stock price reactions that approach zero. In contrast, correct positive events are associated with very large negative stock price reactions. This finding indicates our criteria for identifying correct positives capture economically important distinctions between the correct positive and false positive subsamples.

To avoid the false positives problem, many researchers cull their samples manually to identify meaningful cases of misconduct. Unless the researcher meticulously documents his culling methodology or makes his culled sample publicly available (e.g., see Hennes et. al. (2008)), such methods cannot be replicated. We find that our criteria – which are easily replicable – yield samples of correct positives that are larger than the culled samples used in many papers. Furthermore, the share price reactions among such manually culled samples frequently are larger in magnitude than the share price reactions using our objective criteria for selecting correct positives. This suggests that, even when researchers are aware of the false positives problem, they may overcorrect for it and end up with samples that are weighted toward extreme cases of misconduct.

This paper proceeds as follows. Section 2 illustrates the challenges faced by users of these databases with two case studies involving financial misrepresentation at Brocade Communications, Inc. and Professional Transportation, Inc. Section 3 discusses the four

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3 For examples of this type of data culling using the GAO database, see Hennes et al. (2008). For the SCAC database, see Gande and Lewis (2009) and Dyck et al. (2010). For the AAER data series, see Dechow et al. (1996); Dechow et al. (2011); Erickson et al. (2004; 2006); and Schrand and Zechman (2012).
databases we analyze (GAO, AA, SCAC, and AAER) and how we construct a combined
database (the Federal Securities Regulation (FSR) database) to document these four databases’
potential problems. Section 4 provides exact measures of the extent of the five types of potential
problems that researchers must navigate: (1) stale initial revelation dates, (2) scope limitations,
(3) errors of omission, (4) duplicate events, and (5) false positives. In Section 5 we document
that the potential errors are economically important using standard event study analyses. Section
6 summarizes our results. In addition, Appendix A provides a list of nearly 100 published
finance and accounting papers that rely on these databases, and Appendix B contains a detailed
description of the four databases. Four additional appendices are available online.\(^4\)

Before proceeding, we should acknowledge the potentially sensitive nature of our
analysis of the GAO, AA, SCAC, and AAER databases. We do not seek to criticize other
researchers’ methodologies, nor do we criticize the databases per se.\(^5\) Rather, we seek to identify
and measure the magnitude of the potential problems when these data are applied to certain
(albeit very common) research applications. Our objective is to facilitate the use of these
important data in future research. We also acknowledge the probability of some error as we
compiled the combined FSR database. We have loaned significant portions of the FSR database
to more than 75 researchers. To date, none have reported any data errors. However, to the
extent the FSR database contains errors, the potential error rates we document in the other
databases will be measured with noise.

financial misconduct case that is summarized in Section 2. Appendix D describes the financial misrepresentation
statutes of the 1933 Securities Act and 1934 Securities Exchange Act. Appendix E reports on the differences in the
definition of “fraud” used by legal, finance, and accounting scholars. Appendix F explains in detail how we
transform related events from each database into unique cases of misconduct.

\(^5\) We speak from experience, as one of the coauthors of this paper has written papers that are subject to some of the
data problems documented in this paper.
2. An example: Brocade Communications, Inc.

On January 6, 2005 Brocade Communications, Inc., the world’s leading provider of networking storage solutions, issued a press release revealing that its financial statements for the fiscal years ending 2001 through 2003 should no longer be relied upon due to improper accounting for stock options compensation. The press release also mentioned that the firm’s 2004 Form 10-K, which was scheduled to be filed with the SEC the following week, would be late due to the firm’s accounting issues.6

This initial announcement was the first event in a long sequence of restatements, lawsuits, and regulatory actions that culminated with the former CEO’s criminal conviction for options backdating charges being upheld by an appellate court on October 13, 2011. During this 6.5-year time period, Brocade fired its CEO, announced that the SEC was conducting an investigation which led to a series of civil and criminal enforcement proceedings, restated earnings four times, was subject to and settled a class action lawsuit, and saw its former CEO and Vice President of Human Resources each sentenced to prison for misrepresenting the firm’s financial statements and two former CFOs censured and penalized by the SEC. Figure 1a summarizes the corresponding sequence of 23 unique event days upon which specific information about Brocade’s financial misconduct, and its consequences, were conveyed to the public.

Empirical researchers frequently seek to examine the antecedents of financial misconduct; its consequences for firms, rivals, financial markets, and financial reporting; and the influence of misconduct on firm actions or characteristics. To do this, researchers require a sample of firms that engaged in (or are suspected to have engaged in) financial misconduct. The Brocade case clearly could be part of such a sample. Indeed, we specifically chose Brocade as

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an illustrative example because it appears in all four of the databases (GAO, AA, SCAC, and AAER) commonly used by researchers to identify cases of misconduct. But even in this relatively clean example in which all four databases identify the financial misconduct, an unwary researcher still encounters several problematic data-related issues.

Suppose, for example, a researcher relies on the SCAC database of class action lawsuit filings. This database contains information relating to 3,421 federal class action securities fraud lawsuits from 1996 through 2010, and two of its events are the class action lawsuit filed against Brocade Communications, Inc. on May 19, 2005, and the reported $160 million settlement on June 3, 2008. What if a researcher wants to measure the share value effect of Brocade’s misconduct (e.g., see Cheng et al., 2010)? The May 19, 2005 filing date trails the initial revelation of the reporting problem (January 6, 2005) by more than four months. Using a May 19, 2005 event, the market-adjusted one-day stock return is +4.8%, compared to –7.4% on the first day of trading after the January 6 initial revelation announcement.

Or, suppose our researcher suspects that the class action lawsuit will affect some firm characteristic, such as board turnover (e.g., see Fich and Shivdasani, 2007). Does the turnover reflect the lawsuit, or is it affected by whether Brocade had to restate its earnings, or whether the SEC or Department of Justice (DOJ) imposed sanctions on the firm? Information on restatements or SEC and DOJ actions simply are not available to a researcher relying only upon the SCAC database.7

The problem is not resolved by relying on a different database. Many researchers, for example, identify instances of misconduct by using the SEC’s series of Accounting and Auditing

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7 An additional problem, which we do not tabulate here, is that the lawsuit class period of February 21, 2001 through May 15, 2005 (which is reported by SCAC) does not reveal the fact that Brocade’s misrepresentation affects fiscal periods as early as November 1, 1999 and as late as October 31, 2004 (see Figure 1a). Thus, a researcher relying on the SCAC data would misidentify the period in which the firm’s financial statements were in error.
Enforcement Releases (AAERs). AAERs constitute a subset of administrative proceedings and litigation releases issued by the SEC if the release contains information about an accountant. Specifically, the first AAER (AAER-1) states that:

“Future Commission releases announcing enforcement actions involving accountants will be issued as Accounting and Auditing Enforcement Releases (‘AAER’). Henceforth, interested persons will be able to easily distinguish enforcement releases involving accountants from releases in which the Commission announces the adoption or revision of rules related to financial reporting or discusses its interpretive views on financial reporting matters.”

As indicated in Figure 1a, the Brocade case includes two AAERs, issued on April 13, 2009 and February 12, 2010. Thus, a researcher relying on AAER issuance dates would miss the initial revelation of Brocade’s misconduct by more than four years! In fact, because the SEC never issued an AAER directly naming Brocade Communications for its GAAP violations, a researcher might erroneously conclude that the Brocade case did not involve financial misconduct at all. Rather, the two AAERs issued and shown in Figure 1a relate to the SEC’s censure of two former Brocade executives who happen to be CPAs. The AAERs contain no information on the full range of Brocade's misconduct or the extent of the civil and criminal penalties imposed in this case. Such information is available only in the 13 other administrative proceedings and litigation releases by the SEC in this case – none of which received a secondary AAER designation – plus eight additional announcements about the firm’s restatements, securities class action lawsuit and regulators’ initial investigations.8

A third commonly used source of information about financial misconduct is the Government Accountability Office (GAO) financial statement restatements database.

8 As previously discussed, many researchers cull or filter potential observations from the databases for various reasons. A popular filter is a lack of detail concerning when the misconduct occurred, or its nature and extent. We have found that it is possible to fill in these details for many AAERs by examining related SEC enforcement releases that do not have a secondary AAER designation.
This database consists of a total of 2,707 restatement announcements made from January 1, 1997 through June 30, 2006. Brocade issued restatement announcements on January 6, January 24, May 16, and November 14, 2005, and the GAO database does a good job by correctly identifying all four of the restatement announcements. In this regard, the Brocade case is unusual. In Section 4 we show that the GAO database misses 52.8% of the restatements in the financial misrepresentation cases it accurately identifies, and completely misses 30.5% of misrepresentation cases in which there was one or more restatement (see Panels A and B of Table 4). Even in the Brocade case, a researcher using the GAO database would not know about the full sequence of consequences to the firm and its managers, since such information is reported in the 19 other announcements listed in Figure 1a. Finally, our hypothetical researcher could use the Audit Analytics (AA) database. For the period 2000 – 2010, this database contains 11,001 financial statement restatement announcements and non-reliance filings. The AA database identifies two of Brocade’s four restatement announcements and misses the other two.

We purposely chose the Brocade example because it is accurately flagged by all four databases. Most cases of financial misconduct, however, are not so widely covered. This is not a criticism of each database, as one would not expect a database of restatement announcements to include securities class action lawsuit data. We are merely highlighting that researchers who consult a database that contains only one type of misconduct event will not have a complete set of information as to the full extent of a firm's misconduct. As a more typical example, Figure 1b displays an event timeline for Professional Transportation, Inc., a Georgia-based firm that

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9 We note three smaller issues with the GAO data in this case, which illustrate other potential problems that we do not tabulate. First, the initial restatement announcement on January 6 occurred after the close of trading in U.S. financial market, so a one-day return calculation on January 6 would not capture the market’s reaction to the restatement announcement (although a return window interval that includes January 7 would). Second, the GAO database erroneously records the January 24 announcement date as January 25. Third, the GAO database does not indicate the period during which the books were in error.
operated an interstate trucking business that engaged in financial reporting fraud involving fictitious sales. On May 15, 2000, the firm announced a seemingly immaterial restatement of its 1999 quarterly results, which it attributed to staff resignations and a change in the firm’s data processing system. On November 9, 2000, the firm announced the true reason for its May 15 restatement – fictitious revenues – and disclosed that it would restate other periods as well. Professional Transportation filed for bankruptcy under Chapter 7 on November 30, 2000. The first SEC regulatory action related to this financial fraud occurred nearly three years later on October 2, 2003. The SEC formally revoked the firm’s securities registration on December 1, 2003, and the SEC issued two additional regulatory releases on April 7 and June 30, 2004.

The GAO database completely misses this case of misconduct even though two restatements were announced in 2000. The AA database identifies the May 15, 2000 restatement announcement but misses the November 9, 2000 restatement announcing fraudulent activity. This is an important omission, because most researchers looking only at the May 15, 2000 restatement would conclude that the restatement was not a case of fraud. Indeed, the firm’s one-day market-adjusted stock return on May 15 is +4.2%. The November 9, 2000 restatement, which the AA database misses, is associated with a –33.0% market-adjusted return. The SCAC database (appropriately) misses this case because no securities class action lawsuit was ever filed. The AAER data series does a relatively good job by capturing the three SEC releases (out of four total in this case) that received secondary designations as AAERs. However, the first AAER was issued when the firm was no longer actively trading so a researcher using the AAER database who requires an active market price in his analysis might eliminate this case of fraud from his sample entirely.
3. Database comparisons

The examples involving Brocade Communications, Inc. and Professional Transportation, Inc. are not unusual. In Section 4 we report on the exact rates at which each of the four databases suffers from (1) stale initial revelation of misconduct event dates, (2) scope limitations, (3) errors of omission, (4) duplicate events, and (5) false positives. In Section 5 we demonstrate that these potential problems are economically important.

To document the potential error rates in the GAO, AA, SCAC, and AAER databases, we replicated the process used to identify events in the Brocade and Public Transportation analyses for all 1,099 instances in which the SEC initiated an enforcement action for a violation of one or more of three specific provisions of the Securities and Exchange Act of 1934:

(i) Section 13(b)(2)(a), a.k.a. 15 U.S.C. §§ 78 m(b)(2)(A) – which requires firms to keep and maintain books and records that accurately reflect all transactions;

(ii) Section 13(b)(2)(b), a.k.a. 15 U.S.C. §§ 78 m(b)(2)(B) – which requires firms to devise and maintain a system of internal accounting controls; and

(iii) Section 13(b)(5), a.k.a. 15 U.S.C. §§ 78 m(b)(5) – which prohibits knowingly circumventing or failing to implement a system of internal accounting controls, or knowingly falsifying any book, record, or account.  

Our database begins in 1978, as the SEC first obtained authority to initiate regulatory action under the 13(b) provisions in 1977. We begin with the database of 788 SEC enforcement actions initially collected and used by Karpoff, Lee, and Martin (2008a,b) and extend this sample of enforcement actions through December 31, 2011. We refer to the resulting dataset as the Federal Securities Regulation (FSR) database, and we use this database as a benchmark to

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10 Most enforcement actions for financial misrepresentation include other charges as well. The action against Brocade, for example, included charges of financial misreporting under Section 13(a) of the Securities Exchange Act (because Brocade filed one of its financial statements late), and charges of fraud under Section 10(b) of the Securities and Exchange Act (for which two former executives went to jail). When we limit the comparison sample to cases that involve such related violations, the potential error rates are similar to those reported here (e.g., see Section 4.5).
calculate the extent to which the four commonly used databases are subject to the five types of potential problems.

In addition to combining data from the GAO, AA, SCAC, and AAER databases, the FSR database includes data that were hand-collected from seven primary sources: (i) the SEC website (www.sec.gov), which contains SEC press and selected enforcement releases related to enforcement actions since September 19, 1995; (ii) the Department of Justice, which provides information on enforcement activity through a network of related agencies with particular emphasis on high-profile enforcement actions available at www.usdoj.gov; (iii) the Wolters Kluwer Law & Business Securities (Federal) electronic library, which contains all SEC releases and other materials as reported in the SEC Docket since 1973 and select Federal Securities Law Reporter releases from 1940 to 1972; (iv) Lexis-Nexis’ FEDSEC:SECREL and FEDSEC:CASES library, which contains information on securities enforcement actions; (v) the PACER database, which contains lawsuit-related information from federal appellate, district and bankruptcy courts; (vi) the SEC’s Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system; and (vii) Lexis-Nexis’ All News and Dow Jones’ Factiva, which includes news releases announcing a firm is subject to private civil suits and regulatory scrutiny. Appendix F provides additional detail on how we merged the GAO, AA, SCAC, and AAER databases into the FSR database, as well as on how the AAER database was constructed.

In this paper we use the term “case” to describe the group of related events that identify a potential instance of misconduct. To group related events into cases for the GAO, SCAC, and AAER databases, we read all the events in these databases and manually matched all related events into cases. Yielding to the sheer number of events in the AA database, we use a cruder two-step procedure to map AA events into cases. First, we use the FSR dataset to identify all AA events that correspond to cases that include 13(b) violations. For example, the Brocade case
has two AA restatement announcements, so we group these two restatements into a single case that is identified by the AA database. Second, for the remainder of the AA events that are not associated with a case with a 13(b) violation, we group restatement announcements by company name and combine multiple restatements made by a firm into a single case if the restated periods either overlap or are contiguous.

Panel A of Table 2 reports on the numbers of events and cases in each of the databases. The GAO database consists of 2,707 restatements that pertain to 2,321 separate instances of alleged misconduct (i.e., cases). As of the end of 2010, the AA database has 11,001 restatements that pertain to 8,358 separate cases, the SCAC database has 3,421 lawsuit filings that pertain to 3,116 separate cases, and the AAER database has 3,568 SEC releases that pertain to 1,356 unique cases.

To document the first three types of potential problems (stale initial revelation dates, scope limitations, and omissions), we focus on the subset of each database’s unique cases in which regulators initiated an enforcement action for financial misrepresentation. That is, we examine the intersection of the database’s cases with the 1,099 cases in the FSR database. This assures that we focus on instances of actual financial misrepresentation. For the GAO database, there are 290 such cases (which include 427 GAO-identified restatement announcement events). The AA database contains 188 cases (which include 239 AA-identified restatement announcement events) in which regulators took action for financial misrepresentation, the SCAC

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11 The last AAER in 2011 is numbered AAER-3350. Some AAERs, however, refer to misconduct at more than one firm. Our count of AAER releases includes all firm-AAER combinations. In counting AAER firm-events, we exclude 66 AAERs that reinstate previously disbarred or suspended accountants, eight AAERs that were never issued (AAER-372 through AAER-379), two interpretive AAERs that provide financial reporting guidance (AAER-82 discusses the significance of oral guarantees to the financing reporting process and AAER-120 discusses accounting for loan losses by registrants engaged in lending activities), and five AAERs that were “intentionally omitted” according to the SEC Docket (AAER-1029, 1092, 1400, 1941, and 2579). See Appendix F for a detailed description of our mapping of AAERs to the creation of the AAER database used in our calculations.
database contains 346 such cases that include 389 SCAC-identified securities class action lawsuits, and the AAER database has 939 such cases that include 2,865 individual AAERs.

This approach gives full credit to the database user for accurately culling the database to eliminate duplicate events and remove instances of less egregious misconduct (referred to as “errors” by Hennes et al. 2008). If we relax our assumption of researcher diligence, the fourth and fifth types of potential problems (duplicate events per case and false positives) come into play. To calculate the extent of these potential problems, we use the full, unfiltered samples of the GAO, AA, SCAC, and AAER databases in our analyses.

Panel B of Table 2 further describes the events in the FSR database. Of the 10,415 events that pertain to these 1,099 unique cases of financial misrepresentation, 1,442 are restatement announcements, 615 are announcements of securities class action filings, 630 are of securities class action settlements, 3,066 are SEC enforcement releases that also receive designation as AAERs, and 1,445 are SEC enforcement releases that do not receive AAER designation. In addition, there are 1,298 “Other regulatory events,” which include press releases of enforcement activities undertaken by the DOJ. The 1,919 “Other press releases and material announcements” includes press reports that reveal the likelihood of misconduct (and which frequently trigger SEC inquiries and class action lawsuits), such as earnings forecast revisions, auditor changes, employee turnover, and Federal Bureau of Investigations (FBI) investigations.

Frequently, multiple events occur on the same calendar date. So the 10,415 events in the FSR database identify 8,787 unique event dates. To illustrate, Panel B of Table 2, reports that there are 1,104 unique event dates with only restatement announcements, plus an additional 274 dates with both a restatement announcement and an “Other press releases and material announcements” event. Overall, the average case involves 9.48 announcement events spread over 8.0 unique event dates.
As shown in Figure 2, one reason the databases differ is that they cover different time intervals. The GAO database covers the shortest period (1997 – June 30, 2006), followed by the AA (2000-2011), SCAC (1996 – 2011), AAER (April 15, 1982 – 2011), and FSR (1978 – 2011) databases. Note that we truncate the AA and SCAC databases at December 31, 2010, while continuing to gather data on SEC and DOJ enforcement activities (including AAERs) through 2011. This is because restatements and class action lawsuits typically precede regulatory enforcement proceedings. We want to assure that we do not mistakenly count AA or SCAC cases as false positives when regulators initiate enforcement action in 2011 for cases in which there was a restatement or class action lawsuit filing before 2011.

4. How large are the potential problems?

4.1. Stale initial revelation dates

The first type of potential problem illustrated by the Brocade example is that the databases typically do not identify the initial date upon which news of the misconduct is first revealed to the public. This is because the initial revelation can occur via many different types of announcements. Brocade’s initial revelation was a restatement announcement, but this is not typical. Figure 3 shows the distribution of the types of events that initially reveal the 1,099 cases of financial misrepresentation where a Section 13(b) violation is reported (i.e., the cases in the

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12 While AAER-1 was issued on April 15, 1982, AAER-1 indexes and classifies 20 previous cases of financial misconduct that effectively extend its coverage period backwards. The earliest of these 20 previous cases had a related regulatory proceeding issued as early as September 24, 1971.

13 Among all cases in which regulators take action for financial misrepresentation and there is a restatement or class action lawsuit event, the initial regulatory proceeding occurs within one year of the restatement or class action lawsuit in three-quarters of the cases. Only rarely does an initial restatement (20 out of 1099 cases) or first security class action lawsuit filing (33 out of 1,099 cases) occur after the initial regulatory action. None of the regulatory enforcement actions initiated in 2011 contain a restatement or class action filing event in 2011, so it is unlikely that using a December 31, 2011 cutoff for the regulatory enforcement data causes any meaningful bias to our counts of false positives and errors of omission.
Restatement announcements serve as the initial revelatory announcement event for only 27.2% of the cases (299 of 1,099). Fewer than half (11.6%, or (114+13) ÷ 1,099) of these initial revelation events are captured in the GAO database, and only 3.8% ((29+13) ÷ 1,099) are captured in the AA database.

Class action lawsuit filings reveal only 6.4% (70 of 1,099) of the financial misrepresentation cases, and only a third of these events (26) are included in the SCAC database. Regulatory releases issued by the SEC and/or DOJ reveal an additional 8.5% (93 of 1,099) cases, and roughly one-third of these releases (26 of 67) receive a secondary designation as an AAER. Therefore, a data filter based solely on AAERs would correctly identify only 2.4% (26 of 1,099) of the initial revelation dates of all financial misrepresentation cases. In the majority of cases (793 of 1,099), the initial revelation of misconduct is revealed to investors via announcements that do not involve restatements, securities class action lawsuit filings, or regulatory releases (e.g., AAERs, administrative proceedings, and litigation releases). These other types of events include announcements that report on revised earnings expectations, internal investigations of misconduct, changes in auditors, executive changes, delayed filings, legal problems, unusual trading in the firm’s stock, and informal inquiries or formal investigations by regulators.

In the Brocade example, the GAO database accurately identifies the initial revelation of misconduct. In most cases, however, the GAO database does not perform so well. Figure 4 provides a histogram of the staleness of the first GAO event date, relative to the initial revelation date, for the 290 cases in the GAO database associated with a Section 13(b) violation for financial misrepresentation, and corresponding summary statistics on the degree of staleness are

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14 In 156 cases, the initial revelation involves two types of announcement, e.g., both a restatement and a class action lawsuit filing. In such cases we give credit to both categories as the initial revelation type for that case. As a result, there are 1,255 total initial revelation events used to construct Figure 3.
reported in Panel A of Table 3. The median initial GAO restatement occurs 14 calendar days after the initial revelation of misconduct. The distribution of staleness is skewed, as the mean is 187 days and the maximum is 2,242 days. This maximum occurred at Aspen Technology, which restated its financial statements more than six years after the initial public revelation of its misconduct. The minimum, –3 days, occurs when a restatement announcement is issued on a Friday after the stock market is closed. In such a case, the restatement is dated three calendar days before the day on which a price reaction to the restatement can be observed (i.e., the following Monday).

The AA database identifies restatements that are associated with 188 of the cases that involve SEC charges for financial misrepresentation. For these 188 cases, the median staleness of the initial AA restatement date is 66 days, with a mean of 242 days. Like restatements, class action lawsuit filings typically lag the initial revelation of the misconduct. For the 346 unique cases identified by the SCAC database, the median staleness of the lawsuit filing date is 23 calendar days, with a mean staleness of 150 days and a maximum of 2,118 days.

Stale announcements are a pronounced feature of the AAER database. If we focus on the date of the earliest AAER associated with each of the 939 cases of misconduct identified, the median staleness is 991 calendar days and the mean is 1,017 days. A researcher who uses the first AAER associated with a given instance of misconduct will miss the initial public revelation of the misconduct by an average of 2.8 years.\(^{16}\)

\(^{15}\) There are very few cases in which a database’s initial date precedes the actual initial revelation date, so the average absolute deviation is very close to the staleness values reported in Panel A of Table 3.

\(^{16}\) To repeat, these calculations refer only to the subset of AAERs that are associated with a Section 13(b) financial misrepresentation violation. To better understand how AAERs are used, we collected data on all other AAERs released through 2010. These include an additional 722 AAERs that are associated with 412 additional instances of misconduct that did not involve charges of financial misrepresentation (13(b) violations). Rather, they include such charges as insider trading and malfeasance by broker-dealers or mutual fund managers – as long as the misconduct involved an accountant. A total of 77.2% of these additional 412 actions relate to equity funds, 7.5% relate to broker-dealers, 3.6% relate to mutual funds, and the remaining observations are spread across several smaller
Stale information dates can be important when researchers seek to measure the valuation impact of the misconduct. In Section 5, we document that the measurement errors due to date staleness are very large. Even for studies that seek only to identify whether a firm committed financial misconduct in a given year or quarter (e.g., see Graham et al., 2008), highly stale event dates would affect a researcher's assessment of the timing of the misconduct.

4.2. Scope limitations that result in incomplete information

The second database feature illustrated by the Brocade example is that each database (by design) captures only one type of announcement about the financial misconduct. For example, the GAO and AA databases contain information only about restatement announcements. Thus, each database misses most of the events that convey important incremental information about the misconduct. By incremental information, we include any of the following events: (i) the initial revelation of misconduct; (ii) press releases or new stories that the firm is subject to an informal inquiry or formal investigation by regulatory authorities, or that the SEC has issued a Wells notice, (iii) restatements related to the misconduct; (iv) private lawsuits and settlements related to the misconduct; and (v) regulatory actions by the SEC or DOJ related to the misconduct (including AAERs). Many press announcements appear in multiple outlets and at different times. In such cases we ignore redundant announcements.

Panel B of Table 3 summarizes the extent of such scope limitations for the GAO, AA, SCAC, and AAER databases. The GAO database identifies 427 restatements that correspond to 290 unique cases in which 13(b) violations were prosecuted. This is an average of 1.47 GAO categories. This tabulation helps to illustrate the reason that some SEC releases receive a secondary designation as an AAER: it appears to be sufficient only that an accountant is involved. That is, many AAERs are unrelated to financial misrepresentation in a public firm.
events per case. When we examine the full range of events that reveal incremental information about these 290 cases, we detect 4,336 events – an average of 15.0 events per case. Thus, during the 9.5-year interval covered by the GAO database, the database misses 90.2% of the relevant information events related to the GAO-detected misconduct cases.

For the 11-year interval covered by the AA database, 239 restatements are identified by the database that correspond to 188 unique instances of financial misconduct that involve 13(b) violations (an average of 1.3 restatements per case). In total, however, there are 2,738 relevant information events pertaining to these 188 cases (an average of 14.6 events per case). Therefore, the AA database misses 91.3% of the relevant incremental information events associated with the AA-detected misconduct cases.

Similarly, for the 15-year interval covered by the SCAC database, 389 lawsuit filings are identified by the database relating to 346 unique instances of financial misconduct that involve 13(b) violations – an average of 1.1 SCAC lawsuit filings per case. In total, however, there are 6,556 relevant information events pertaining to these 346 cases (an average of 18.9 events per case). Therefore, the SCAC database misses 94.1% of the relevant information events associated with the SCAC-detected misconduct cases.

For the AAER database, there are 2,865 AAERs involving 939 unique 13(b) related cases (an average of 3.1 AAERs per case). However, there are 7,919 total relevant information event dates for these 939 cases, or 8.4 events per case. So, the AAER database misses 63.8% of the information events that are relevant and important for understanding the AAER-detected misconduct cases.

The additional information contained in the missing events can be important for researchers who seek to understand the nature of the misconduct and the full consequences to the firm, whether the misconduct is associated with other types of misconduct or charges (e.g.,
fraud), the number of respondents that are involved in the misconduct, or the penalties imposed on the various respondents. Many researchers work to mitigate the scope limitations in any one of these databases by hand-collecting additional information about the cases they identify (e.g., Efendi et al., 2007). Such additional information can be critical. In Section 5 we show that the case-related information events missed by each database is more important in terms of its valuation impact than the information events captured by each individual database.

4.3. Errors of omission

4.3.1. Missing same-type events for cases of misconduct that are correctly identified

In addition to stale dates and incomplete records, each database has two significant types of errors of omission. The first type can be illustrated by the Brocade example. Brocade issued a total of four financial restatement announcements that were prompted by its misrepresentation. The GAO database correctly identifies all four restatements, indicating that the GAO database performs well in its claim to identify all relevant restatement announcements. Even though the GAO database misses 19 other relevant information event dates (the scope limitation feature), the database does capture all of the relevant restatements (i.e., the type of information the database aims to capture).

As reported in Panel A of Table 4, however, the GAO database is generally not so comprehensive. We again restrict our analysis to the 290 cases that are flagged by the GAO database and for which the SEC brought action for financial misrepresentation. Across the 290 cases there are a total of 905 relevant restatements. The GAO database captures 427 and misses 478 of these 905 restatements. This means that even if we limit the GAO’s database to the 290 cases correctly identified, the database still misses 52.8% of the relevant restatement announcements.
The AA database has an even higher event omission rate. For the 188 cases for which the SEC brought action for financial misrepresentation that AA identifies, there are a total of 634 restatement announcements. The AA database identifies 239 of these restatement announcements and misses 395, yielding an event omission rate of 62.3%. Similarly, the SCAC database misses some relevant class action filings among the cases of alleged misconduct that it correctly identifies. For the 346 unique cases of misconduct the SCAC identifies, the database identifies 389 lawsuits and omits 36 lawsuits, implying an event omission rate of 8.5%.

The AAER database identifies 2,835 AAERs that relate to 939 cases that include 13(b) violations. For these 939 cases, however, the SEC issued a total of 5,056 administrative and litigation releases. While the AAER database correctly identifies all AAERs, it misses 43.3% of the total SEC administrative and litigation releases that pertain to these cases of misconduct. In the Brocade example in Figure 1a, the SEC issued two releases that received a secondary designation as an AAER. But the SEC issued 13 other releases pertaining to the Brocade misconduct that did not receive AAER designations. This illustrates a challenge for researchers who rely on AAERs, as researchers must collect additional data to identify the 43.3% of non-AAER SEC releases that convey information about the cases that are flagged by one or more AAERs. Because we use the FSR database as a benchmark for the other four databases, the last column of Panel A of Table 4 shows that the FSR database does not miss any misrepresentation-related information events (by construction).

4.3.2. Missing cases of misconduct within the database’s time period

The second type of error of omission is that each of these databases completely misses many relevant cases of financial misconduct that occurred during the time period the database claims to cover. Summaries of this second type of omission rate are reported in Panel B of Table
4. The GAO database aims to report a comprehensive list of material restatement announcements for the January 1, 1997 through June 30, 2006 period. In addition to missing 52.8% of the restatement announcements among the instances of misconduct the database identifies (Panel A of Table 4), the GAO database completely misses an additional 219 restatement announcements that pertain to an additional 127 cases of financial misrepresentation during the time period the database covers. These omitted restatements are associated with instances in which the target firms faced SEC and DOJ enforcement activity for 13(b) financial misrepresentation charges, so these restatements are related to substantive misrepresentation issues. (The omission counts are similar if we focus only on cases involving financial fraud, in which the misrepresentation is even more substantive.)

The AA database misses more cases of substantive misrepresentation than it captures. It captures restatement announcements related to 188 cases of misrepresentation during its 11-year coverage period spanning 2000-2010, but misses an additional 220 cases of misrepresentation during this same time period – a case omission rate of 53.9%. There are a total of 553 restatement announcements associated with these 220 cases that the AA database omits.

Similarly, the SCAC aims to represent a comprehensive sample of securities class action lawsuit filings. But during its coverage period (1996 – 2010), the SCAC misses 43 lawsuit filings that pertain to 36 additional instances of financial misrepresentation. This represents a 9.4% case omission rate. Again, these additional cases involve instances of financial misrepresentation that prompted 13(b) enforcement activity by the SEC, so the omitted lawsuit filings cannot be dismissed as pertaining to immaterial or minor issues.

The AAER database completely omits 160 of 1,099 cases of financial misrepresentation for the time period it covers (1982-2010), yielding a case omission rate of 14.6%. These 160 cases involve a total of 649 different SEC administrative or litigation releases. The AAER
database does not miss these cases because the events are unimportant, as these cases all include charges of financial misrepresentation by the SEC. Rather, the AAER database misses these cases because the SEC staff chose not to assign a secondary AAER designation to any of the SEC’s 649 releases pertaining to these 160 cases.

### 4.3.3. Additional omissions due to limited coverage periods

Every database is constrained by the time period it covers and we do not criticize these databases’ coverage periods. Nonetheless, limited coverage periods can pose additional challenges for researchers. Panel C of Table 4 provides evidence on the extent to which the databases’ sample sizes are limited by their periods of coverage. The GAO database records 427 restatement events that pertain to 290 separate instances of financial misrepresentation from January 1, 1997 through June 30, 2006 (Panel A of Table 4). Within this time period, there are a total of 905 restatement events relating to 417 separate instances of misrepresentation (Panel B of Table 4). Panel C of Table 4 reports that by extending the sample period to 1978 through 2010 (the time period covered by the FSR database less one year to allow for the fact that restatements typically precede regulatory enforcement proceedings), one can identify an additional 303 restatements associated with 161 additional cases of financial misrepresentation. Extending the AA coverage period to 1978 – 2010 identifies an additional 240 restatements pertaining to 170 additional cases of misrepresentation. Similarly, extending the SCAC database to the 1978 – 2010 time period identifies an additional 145 lawsuit filings associated with an additional 141 cases of financial misrepresentation.

As reported above, while the first AAER was issued on April 15, 1982, this first release retroactively reported on releases that would have received a secondary AAER designation from September 24, 1971 through April 15, 1982 if the designation has been in place during that time.
The SEC first obtained authority to initiate regulatory action under the 13(b) provisions in 1977, so there are no additional 13(b) cases that can be identified simply by extending the sample period of the AAER database. Therefore, both the AAER and FSR databases are not subject to the omitted cases, as defined here, due to their coverage time periods.

4.3.4. Summary of omission rates

Panel D of Table 4 summarizes the rates at which each database contains errors of omission. During the 1978 – 2010 period, there are 578 cases of financial misrepresentation that triggered SEC enforcement action for which there were one or more restatements, and there are 1,427 restatement events related to these 578 cases. The GAO database identifies only 427 of these restatements related to 290 of these cases. Thus, the GAO misses a total of 288 cases, 127 of which had restatement announcements during the GAO database’s coverage period. The AA database identifies 188 of the 578 cases with at least one restatement event, or 35% fewer than the GAO database. The majority of the omissions (220 cases, or 56.4% of the 390 cases omitted) had restatement announcements during the AA database’s coverage period.

In terms of omitted cases, the SCAC and AAER databases fare better. The SCAC database identifies 346 of the 523 financial misconduct cases that have at least one class action lawsuit. Only 36 of the 177 omitted cases occurred during the SCAC’s coverage period of 1996-2010. Similarly, the AAER database omits 160 of the 1,099 cases of financial misrepresentation for which there was one or more SEC enforcement release, all of which occurred during the AAER’s period of coverage.

Many researchers are aware of omissions in these databases, and seek to augment their samples by searching for cases that are not included in the database they use (e.g., see Burns and Kedia, 2006). Such searches can be important for avoiding small sample bias problems. They
also help to avoid biases in tests that rely on control samples. A common procedure is to compare misconduct firms with control firms that are presumed not to have misconduct (e.g., see Efendi et al., 2007; Kedia and Phillipon, 2009; Shivdasani and Song, 2011). If the control firms are selected from a pool that includes many misconduct firms, the tests will be biased and suffer from low power. As Burgstahler (1987) demonstrates, low power tests can increase the probability of observing seemingly significant test results even when the null hypothesis holds.

4.4. Duplicate or follow-on events for the same instance of financial misconduct

Researchers seeking instances of misconduct must deal with the fact that each of these databases contains multiple events that are related to a single instance of (possible) misconduct.\textsuperscript{17} For example, the Brocade case includes four separate restatements, all of which are identified in the GAO database and two of which are identified in the AA database. Table 5 reports on the incidence of such duplication in the databases. The first column of Table 5 shows that the GAO database identifies exactly one restatement announcement for 2,028 cases, or 87.4% of the potential misconduct cases the database identifies. The GAO database contains two separate restatement announcements that pertain to the same instance of possible misconduct for 229 instances of potential misconduct, three restatement announcements in each of 43 cases, and four or more related restatement announcements in 21 additional cases. In summary, 679 of the 2,707 restatement announcements (25.1%) in the GAO database are follow-up restatement announcements in that they relate to an instance of possible misconduct that is flagged by a previous restatement in the database.

\textsuperscript{17} In this section we use data from all of the events in each database. As most researchers point out (e.g., see Hennes et al. (2008) and Gande and Lewis (2009)), many restatements and lawsuits do not appear to involve substantive issues of misconduct. Hence, we refer to the cases that are flagged by the databases as involving possible misconduct. False positives are discussed below in section 4.5.
The second column of Table 5 shows that the AA database identifies exactly one restatement announcement for 6,498 separate instances of possible misconduct, or 77.7% of all cases the AA database identifies. In 15.8% of its cases, the AA database contains two separate restatements, and in 6.5% of its cases the database contains three or more restatement that pertain to the same instance of misconduct. In total, 4,503 of the 11,001 restatements (40.9%) in the AA database are follow-up restatements in that they relate to an instance of (possible) misconduct that is flagged by a previous restatement in the database.

The third column of Table 5 shows that the SCAC database contains 3,421 events relating to 3,116 separate instances of possible financial misconduct. The SCAC database is constructed such that it eliminates many duplicates by linking together lawsuits that are associated with the same case of misconduct. Such linking is not perfect, however, as we find that 536 SCAC lawsuit filings (15.7%) are duplicates related to cases that are flagged by prior lawsuits in the database.

The fourth column of Table 5 shows that the majority of misconduct cases (59.4%) that receive a secondary designation as an AAER are associated with more than one AAER. In particular, 551 of the cases have one AAER, 340 have two AAERs, 172 have three AAERs, with the remaining 293 cases having four or more AAERs. This means that 3,017 of the 3,568 AAERs (84.6%) are duplicates related to cases flagged by previously issued AAERs. At the extreme, the enforcement action involving Enron includes 46 different AAERs.

The final column of Table 5 presents the events per case frequency for the FSR database. Fewer than 1% of the FSR cases have a single event, highlighting that the misrepresentation cases in the FSR database contain more follow-on events than any of the other databases. In fact, over half the FSR cases have more than seven events. This is by design, as the FSR
database includes all restatement announcements, lawsuit filings, and regulatory releases related to each case of misconduct the database captures.

A naïve user might treat all events in a database as independent indications of misconduct. The data in Table 5 shows that any assumption of independence among events would be violated for a substantial fraction of the events in any one of the databases. To avoid this problem, many researchers discard all but the first event pertaining to a given firm (e.g., see Graham et al., 2008). This avoids counting the same case more than once, but can exacerbate the problems of incomplete information and omitted events discussed in Sections 4.2 and 4.3. Other researchers read the case files closely (e.g., see Dechow et al., 2011) or hand-collect additional information (e.g., see Gleason et al., 2008) to determine whether multiple events pertain to the same case of misconduct. Our results indicate that such a painstaking approach can be useful in avoiding potential problems from scope limitations, omissions, and duplicate events.

4.5. False positives

It is widely suspected that these databases contain false positives (i.e., cases that most likely do not involve financial misconduct). For example, Hennes et al., (2008) identify 73.6% of the GAO restatements as “errors” (i.e., false positives) and 26.4% as “irregularities” (i.e., corrections of materially misleading information).\textsuperscript{18} Dyck et al. (2010) begin with 2,171 SCAC database cases, but cull their sample down to 216 cases to eliminate small firms (assets < $750 million), small settlements (less than $3 million), and other cases judged not to represent instances of meaningful misconduct. Dechow et al. (2011) motivate their investigation of

\textsuperscript{18} Specifically, Hennes et al. (2008) classify a restatement as an irregularity (as opposed to an error) if the restatement is announced using any variety of the words “fraud” or “irregularity”; the Securities and Exchange Commission or Department of Justice is conducting an investigation related to the restatement; or there are other investigations into the accounting matter (e.g., the hiring of a forensic accounting firm).
AAERs in part by pointing out that the GAO and SCAC databases may contain many false positives.

Whether any individual case is a false positive depends on the research question. For example, researchers examining financial misconduct might not be interested in technical restatements, whereas for other researchers the distinction between material and technical restatements may not be important (e.g., see Graham et al., 2008). Thus, researchers using these databases must use personal judgment to choose which cases to include in their empirical analyses.

Nonetheless, we can provide data on the risk of false positives for researchers who seek to collect samples of financial misconduct by comparing these databases to the FSR database. By this criterion, the case is classified as a false positive if it is not associated with any SEC regulatory action for financial misrepresentation. This is not a perfect screen, as some instances of financial misconduct may prompt restatements or lawsuits without triggering regulatory action. In addition, some AA and SCAC (and GAO, although less likely because the database ends in 2006) events may become associated with enforcement actions that are initiated after 2011; if so, our false positives measures will be slightly overstated. The false positive rates presented in Table 6 indicate that this feature can be a significant problem in many applications. The GAO database identifies 2,707 events, but only 427 (15.8%) of these events are associated with cases of alleged misconduct in which regulators initiated an enforcement action for financial misrepresentation. By this screen, 2,280 (84.2%) of the GAO events are false positives. The AA database identifies 11,001 restatements and only 239 are related to cases in which regulators take enforcement action for financial misrepresentation. This implies a false positives rate of 97.8%. Using the SCAC database, 3,032 of the 3,421 lawsuit filing events are not associated with cases that involve actions for financial misrepresentation by regulators, yielding
a false positive rate of 88.6%. Such a high rate is consistent with the results in Dyck et al. (2010), who argue that many of events in the SCAC database are frivolous lawsuits. In contrast, the false positive rate for the database of AAERs is only 19.7%. This does not mean that 80.3% of the AAERs directly refer to charges of financial misrepresentation. Rather, 80.3% of the AAERs are associated with SEC enforcement actions that include financial misrepresentation charges issued sometime during the time span of the related enforcement action.

As noted in Section 4.4, each of these databases contains duplicate events in the sense that they refer to, or were triggered by, the same instance of possible misconduct. Panel B of Table 6 reports the false positive rates if the duplicate events are accurately combined into unique cases. Using the GAO database, there are 2,321 unique cases of (possible) misconduct, 290 of which prompt SEC action for financial misrepresentation. This implies a false positives rate of 87.5%. The corresponding rate of false positives, based on unique cases, is 97.8% for the AA database, 88.9% for the SCAC database, and 30.8% for the AAER database. The FSR database has a false positive rate of 0% by construction, as we define a false positive as a case of (alleged) misconduct that does not prompt regulatory enforcement action for financial misrepresentation.

Many researchers seek to examine not just instances of financial misrepresentation, but cases of financial fraud.19 Fraud implies that the perpetrator intended to deceive stakeholders, and intent to deceive requires a higher burden of proof than is necessary to bring charges of financial misrepresentation under Section 13(b) of the Securities Exchange Act. We define a case as involving fraud if the SEC or DOJ file charges alleging the violation of: (i) Section 17(a)

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19 We recognize that the term “fraud” has both colloquial and technical meanings. It is possible that researchers who use the term “fraud” do so loosely, merely intending to say that their samples consist of activities that may be suspicious in some unspecified way. We argue, however, that such informality adds ambiguity to the nature of the events in the sample. Online Appendix E highlights several differences in the definition of “fraud” as used in the legal, finance, and accounting literatures: http://faculty.washington.edu/karpoff/KKLM%20Internet%20Appendices.pdf.
of the 1933 Securities Act for fraudulent interstate transactions related to the issuance of a
security; or (ii) Section 10(b) of the 1934 Securities Exchange Act for manipulative and
deceptive devices related to the trading of an already issued security.\footnote{Many instances of financial misconduct also trigger fraud charges that are not unique to financial or reporting violations, including wire fraud and mail fraud. The FSR database tracks such charges if they relate to any of the 1,099 cases of misrepresentation. A further qualification is in order regarding the SCAC cases. Most security class action lawsuits are brought under Section 10(b) of the Securities Exchange Act, and allege fraud by the firm (and sometimes also by individuals associated with the firm). A user of these data could justifiably describe his or her sample as consisting of cases of (alleged) fraud.} As reported in the last
column of Panel C of Table 6, financial fraud charges are included in only 821 (74.7%) of all
1,099 FSR cases.

Financial fraud is less common than financial misrepresentation, so the rates of false
positives are higher than those discussed above if a researcher uses the GAO, AA, SCAC, or
AAER databases to identify financial fraud. As reported in Panel C of Table 5, the false
positives rate increases to 89.4% for the GAO database, 98.1% for the AA database, 90.4% for
the SCAC database, and 46.2% for the AAER database. Again, these rates should be considered
to be upper bounds. We also acknowledge that financial fraud charges can be included for other
types of misconduct that do not include Section 13(b) violations, which might show up in the
GAO or SCAC databases. Our screen would inaccurately classify such cases as false positives.

As noted, many researchers are sensitive to the false positives problem and work to cull
their samples before conducting empirical tests. We note, however, two distinct advantages to
our approach to identifying false positives. First, our criteria (i.e., are 13(b) charges or financial
fraud charges included?) provide arms-length, replicable methods to separate actual cases of
financial misconduct from the other events in these databases. Second, these objective criteria
identify a \textit{larger} number of correct positives than the sample sizes used in many papers. For
example, Beneish (1999) culls his AAER sample down to 50 cases, and Ozbas (2008) ends up
with a sample of 75 AAERs. This implies that the ad hoc culling methods used by many
researchers can be very aggressive, generating samples that are unrepresentative of the average case of financial misconduct. In section 5 we show that such aggressive culling tends to create samples of extreme events that have unusually high stock price reactions.

5. The economic importance of the potential database problems

5.1. Stale initial revelation dates

In this section we demonstrate that the potential problems documented in Section 4 are economically meaningful. The first potential problem is that, for the instances of misconduct captured, each database typically does not identify the initial public revelation of the misconduct. Panel A of Table 7 reports on the importance of the stale date problem in an event study. The GAO database identifies 290 instances of misconduct that triggered SEC sanctions for financial misrepresentation. CRSP data to measure stock returns for the initial GAO restatement date are available for 260 of these cases. The mean one-day market-adjusted share return for these 260 GAO dates is -7.06%, and the median is -2.13%. While these are significant declines in value, they are poor measures of the actual impact on share values from the initial revelation of the misconduct that resulted in the restatements. Using the actual initial revelation date, the mean market-adjusted return is -16.17%, with a median of -9.31%. That is, the mean abnormal return as measured by the initial GAO restatement date understates the mean return on the initial revelation date by 56%. Using medians, the GAO data understates the initial return by 77%. The differences between the GAO-based measures and the actual initial revelation date measures are statistically significant at the 1% level.

The comparisons using the AA, SCAC, and AAER databases are similar. CRSP returns are available for 137 of the initial events related to the 188 cases of misconduct identified by the AA database. For these 137 cases, the mean one-day abnormal return is -4.83%, with a median
of -1.67%. This is significantly smaller than the mean abnormal return of -13.59% that results from using the actual initial revelation dates for these 137 cases. Thus, a researcher using the AA dates would understate market reaction to the initial revelation of misconduct by 64% (79% using medians). CRSP returns are available on the class action lawsuit filing date for 300 of the 346 cases identified by the SCAC database that involved regulatory penalties for financial misrepresentation. The mean one-day abnormal return is -5.43%, with a median of -1.21%. Using the actual initial revelation date for these 300 cases, the mean abnormal return is -18.64% with a median of -13.55%. Thus, the SCAC dates would lead a researcher to understate the mean initial share price reaction by 71%, and the median by 91%. Using the initial AAER events, the understatement is 73% using means, and 85% using medians.

5.2. Scope limitations and incomplete information

These measurement errors are magnified if we seek to understand the share price effects of the full sequence of events that occur when a firm’s misconduct is revealed. While the share price reaction at the initial revelation capitalizes investors’ expectations about the nature of the misconduct and its consequences, the subsequent announcements (i.e., restatements, lawsuits, AAERs, other regulatory actions, etc.) yield additional information about these consequences. Panel B of Table 7 reports on how the databases perform in measuring the impact on share values of the full sequence of events that reveal information about the misconduct. For each firm, we compute the one-day market adjusted stock returns for all relevant announcements pertaining to each case of misconduct, and sum over all such announcements. Panel B reports the mean and median of these summed one-day abnormal returns.

As each of these databases contains only a subset of the full sequence of relevant announcements about the misconduct, the absolute differences measured in Panel B are much
larger than in Panel A. The cumulative abnormal returns for the GAO, AA, SCAC, and AAER databases therefore sum over a small subset of the important event dates. In Panel B, returns data are available to compute the cumulated abnormal return for 265 of the 290 cases in the GAO database that trigger regulatory enforcement action for financial misrepresentation.\textsuperscript{21} The mean cumulated abnormal return is -7.82%, with a median of -2.45%. By comparison, the mean cumulated abnormal return summing over all event dates in each of these 265 cases is -50.36%, with a median of -35.54%. The differences are significant at the 1% level.\textsuperscript{22}

These results indicate the magnitude, in terms of share values, of the scope limitation problem. A conscientious researcher who relies upon the GAO data, for example, might carefully eliminate immaterial events and combine information from multiple restatements that pertain to a given case of financial misconduct. Nonetheless, this researcher would not have information about the sequence of related announcements that on average constitute 84% of the value-related information about the misconduct and its discovery. Put another way, even a conscientious user of the GAO data would capture an average of only 16% (7% using medians) of the value-relevant information pertaining to the GAO database’s cases of misconduct.

The cumulative abnormal returns results are similar for the other databases. The mean cumulated abnormal return over the restatements in the AA database is -4.64%, with a median of -1.87%. The mean cumulated abnormal return summing over all event dates in each of these AA-identified cases is -38.38%, with a median of -26.79%. This implies that the AA database captures on average only 12% (7% using medians) of the value-relevant information pertaining to the cases of misconduct that the database identifies. The SCAC database captures on average

\textsuperscript{21}The number of GAO event observations in Panel B (265) is greater than the number of GAO event observations in Panel A (260) because returns data are not available for the first restatement date in five cases but are available for one or more of the subsequent restatements that are included in the GAO database.

\textsuperscript{22}An alternative measure of the cumulated abnormal return would compound the one-day returns, rather than add them. The results using such an alternative measure are similar to those reported.
only 10% (3% using medians) of the value-relevant information pertaining to the cases of misrepresentation it identifies, and the AAER database captures on average 17% (6% using medians) of the value-relevant information for the cases of misrepresentation it identifies.

Some researchers mitigate the scope limitation problem by augmenting their data with additional, typically hand-collected, data about the cases of misconduct they identify (e.g., see Schmidt, 2012). The results in Panel B of Table 7 indicate that, without such effort, the data errors can be very large.

5.3. Effects of false positives on measures of share value effects

As striking as the comparisons in Panels A and B of Table 7 might be, they understate the size of the measurement bias that can arise from using GAO, AA, SCAC, or AAER dates to measure share price reactions to news of financial misconduct. This is because, to make an apples-to-apples comparison, we limited our tests to the subset of cases in each database that are severe enough to attract SEC enforcement actions for financial misrepresentation. That is, the GAO, AA, SCAC, and AAER samples in Panels A and B of Table 7 are drawn from the more serious cases of financial misconduct the databases capture. As discussed in Section 4.5, most events and cases identified in these databases relate to activities that in many research applications would be classified as false positives.

Table 8 reports on the economic importance of including false positives in one’s sample when measuring market reactions. In Panel A, we report the one-day market-adjusted return using all events in each database. The GAO database, for example, has a total of 2,707 events, and only 427 of these events are associated with a 13(b) violation. Returns data are available for 389 of these 427 events, with a mean one-day abnormal return of -5.34%. Using our false positives measure from Section 4.5, the remaining 2,280 events (with returns data available for
are classified as false positives. The mean one-day abnormal return for these false positive events is -1.36%. This much smaller market reaction to restatements unrelated to 13(b) violations is consistent with Hennes et al.’s (2008) finding of a much smaller decline in value for restatements due to “errors” versus those due to “irregularities.”

In Panel B, we repeat this experiment but eliminate all duplicate or follow-on events for each case of misconduct. This mimics the approach taken by researchers who discard follow-on observations for each instance of misconduct. In Panel C, cases are identified as false positives if they do not involve charges of financial fraud by the SEC and all duplicate or follow-on events per case are deleted. This calculates the false positives rate for researchers who seek to identify instances of financial fraud, as opposed to simple financial misrepresentation.

In all three panels, a similar pattern emerges using the GAO, AA, SCAC, and AAER databases. In each panel, the average abnormal return for the correct positives is much larger in magnitude than for the false positives, and the difference is statistically significant at the 1% level. In each panel, however, the abnormal return for the false positives is still negative and statistically significant. This indicates that while the events and cases we classify as correct positives are much more economically important than the false positives, the false positives still contain some value-relevant information. It is possible that our false positives include some meaningful cases of financial misconduct that are not identified as such by the SEC.

Although our criteria for identifying false positives may seem strict, they have the advantage of being objective and easily replicable. Compared to our criteria, many ad hoc culling methods create relatively small samples of extreme events. Using the SCAC data, for example, Francis et al. (1994) use a sample of 45 class action lawsuit filings and report a mean one-day abnormal return of –17.2%. Ferris and Pritchard (2001) examine 89 lawsuit filings and report a three-day abnormal stock return of –25.0%. In contrast, we find that the 301 of the 346
SCAC cases that correctly identify cases of financial misrepresentation that trigger SEC action are associated with a mean one-day abnormal return of only –5.42% (Panel B of Table 8).

Similarly, Beneish (1999) reports a -20.2% three-day abnormal return using data from 54 firms identified by AAERs plus 10 additional firms identified from a media search. Ozbas (2008) reports a three-day abnormal return of –22.5% for 75 AAERs. In contrast, we find that AAERs flag 652 of 939 possible cases, and the associated mean one-day market-adjusted return is only –3.98% (Panel B of Table 8). The large negative returns reported by previous researchers do not result from longer event windows. Rather, the large magnitude of these returns reflects the selection of cases that end up in these researchers’ samples. That is, researchers deploying ad hoc methods to cull false positives frequently end up with small samples of relatively extreme events.

6. Conclusion

Financial misconduct represents a breakdown in financial reporting, market efficiency, corporate governance, and/or regulatory oversight of financial markets. As such, it provides an opportunity to better understand the forces that shape financial reporting, market efficiency, governance, and regulations. Researchers have exploited this opportunity by conducting empirical research into the antecedents and consequences of financial misconduct. Such research has been facilitated by four databases that have been used in nearly 100 papers published in top finance and accounting journals: the Government Accountability Office (GAO) and Audit Analytics (AA) databases of restatement announcements, the Securities Class Action Clearinghouse (SCAC) database of securities class action lawsuits, and the Securities and Exchange Commission’s series of Accounting and Auditing Enforcement Releases (AAERs). This paper compares each database to a newly created database based on the universe of 1,099
cases that attracted SEC enforcement action for financial misrepresentation through 2011. This database combines the events in the GAO, AA, SCAC, and AAER databases, augmented by additional restatement announcements, lawsuit filings, regulatory actions, press reports, and SEC filings that convey incremental information about these cases of misconduct but that are not contained in any of the four original databases. Using this newly created database (which we refer to as the Federal Securities Regulation (FSR) database), we document that the GAO, AA, SCAC, and AAER databases have features that give rise to five distinct types of potential problems for researchers:

(i) **Stale initial revelation dates** – Each database typically does not identify the initial event upon which news of the (alleged) misconduct is revealed to the public. For the cases captured by the GAO restatement database that attract SEC enforcement action for financial misrepresentation, the earliest GAO event date lags the initial public revelation of the misconduct by an average of 187 days. The AA database performs worse (242 days) and the SCAC database performs better (150 days), while the event dates in the AAER database lag the initial revelation of misconduct date by an average of 1,017 days.

(ii) **Scope limitations** – Because each database focuses on only one type of event, each misses most of information events necessary to gather a reasonably full understanding of the (possible) misconduct and the consequences of its public revelation. The GAO database captures only 9.8% of the key information events related to the cases of financial misrepresentation it identifies. For the AA, SCAC, and AAER databases the total event capture rate is 8.7%, 5.9%, and 36.2%, respectively.

(iii) **Errors of omission** – The GAO database misses 52.8% of the restatements that occur within the cases of misconduct it identifies, and fails to identify 30.5% of misrepresentation cases for which there were one or more restatements within the time period the database covers.
The omission rates are even higher for the AA restatement database. The SCAC database misses 8.5% of the securities class action filings that pertain to the cases of misconduct it successfully identifies, and misses 9.4% of the misrepresentation cases for which there were one or more class action lawsuits within the time period the database covers. The AAER database misses 43.3% of the regulatory releases relating to the cases of misconduct it identifies, and completely misses 14.6% of the misrepresentation cases for which there were one or more regulatory releases within the time period the database covers. It is important to point out that the omitted cases are substantial instances of misconduct, as the SEC brought enforcement action for financial misrepresentation in all of them.

(iv) Duplicate events – In the GAO database, 25.1% of the restatement announcements are duplicates in the sense that they pertain to cases of possible misconduct that are identified by other GAO restatement announcements. The duplication rate is 40.9% for the AA restatements, 15.7% for the SCAC lawsuit filings, and 84.6% for the AAER data series.

(v) False positives – Whether any given event is a false positive depends on the research question. But we show that the majority of events in these databases do not identify cases of financial misconduct or fraud as defined by the SEC. The rate of false positives for researchers seeking cases of financial misrepresentation and fraud is 87.5% for the GAO database, 97.8% for the AA database, 88.9% for the SCAC database, and 30.8% for the AAER database.

These are not trifling concerns. We show that, in event studies, the stale date problem causes these databases to understate the average loss to share values when misconduct is revealed by amounts that range from 56% (for the GAO database) to 73% (for the AAER database). The scope limitation problem causes the databases to miss between 83% (for the AAER database) and 90% (for the SCAC database) of the value-relevant information for the cases that each database identifies. The errors of omission contribute to power problems and
introduce systematic errors in tests that rely on control samples drawn from a population of firms incorrectly flagged as free of misconduct. In addition, the high rates of false positives encourage researchers to cull through these databases’ events using ad hoc screens that can reflect aggressive, non-replicable, and perhaps unintentionally selective, sample reductions.

In practice, the exact importance of these potential problems depends on the particular application of each database. Nonetheless, our results yield several suggestions for how these important databases can be used more effectively. First, simple awareness of the complexity of a typical case of misconduct can guide the interpretation of empirical tests. The share price reaction to a class action lawsuit (e.g., see Gande and Lewis, 2009) or an AAER (e.g., see Ozbas, 2008), for example, does not reveal unconditionally new information about the potential misconduct. Rather, it reveals incremental information that is conditional upon the sequence of (identifiable) prior news events about the misconduct.

Second, the allegation of financial misconduct triggers a range of possible consequences, including class action lawsuits, restatements, and SEC enforcement activities. Claims that samples drawn from any one of these databases represent “a comprehensive sample of alleged corporate frauds…” (Dyck et al., 2010, p.2213) or “… a comprehensive sample of material and economically significant accounting misstatements…” (Dechow et al., 2011, p. 24) can be qualified to promote a more accurate representation of the data.

Third, researchers seeking samples of financial fraud should be aware that the term “fraud” has multiple meanings. As shown in Table 6, one fourth of cases that prompt SEC enforcement action do not include any fraud charges. Such actions, including AAERs, are not reliable indications of fraud, as claimed by Karpoff and Lott (1993), Palmrose et al. (2004), and many others. Restatement announcements are associated with fraud charges even less frequently.
Fourth, the GAO, AA, SCAC, and AAER databases are useful in identifying instances of (possible) financial misconduct or restatements. But the events in each database identify only a small subset of the total set of information events that can be relevant for culling or classifying the case, describing the characteristics of the firm involved, and identifying the consequences to the firm. This implies that, in many applications, researchers must supplement the database with other sources of information about the case of misconduct or restatement.

Fifth, the high rates of errors of omission indicate that researchers must exercise care when constructing control samples. Control samples based on firms that do not appear in the GAO, AA, SCAC, or AAER databases may include firms that did, in fact, have restatements, lawsuits, or SEC enforcement activity. To avoid seriously tainted control samples and biased tests, researchers must independently verify that their control firms are, in fact, untainted (that is, did not have contemporaneous restatements, lawsuits, or SEC enforcement actions).

Sixth, our results suggest that when eliminating events that the researcher considers false positives, one should be aware of the selection bias that can accompany ad hoc culling methods. Our tests use two criteria: (i) does the case involve SEC sanctions for financial misrepresentation? Or, (ii) does the case involve charges of financial fraud? These criteria yield samples that cull out a large number of the events in the GAO, AA, SCAC, and AAER databases, but that are still larger than the samples obtained via many ad hoc culling methods.
References


Table 1: Overview of the financial misconduct databases

Descriptions of the four major databases used to identify or examine financial misconduct or financial restatements. These include the Government Accountability Office (GAO) database of restatement announcements, the Audit Analytics (AA) financial restatements database, the Securities Class Action Clearinghouse (SCAC) database of securities class action lawsuits, and the Securities and Exchange Commission's Accounting and Auditing Enforcement Releases (AAERs). In our analysis, the AA and SCAC databases are truncated at December 31, 2010 and the AAER database is truncated at December 31, 2011.

<table>
<thead>
<tr>
<th>Database</th>
<th>Type of Events</th>
<th>Who Maintains Data</th>
<th>Description</th>
<th>Time Period Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Financial statement restatement announcements</td>
<td>Audit Analytics</td>
<td>The AA database tracks all financial restatements disclosed since 2000 in public filings from EDGAR.</td>
<td>Jan 1, 2000 - Dec 31, 2010</td>
</tr>
<tr>
<td>SCAC</td>
<td>Securities class action lawsuits</td>
<td>Stanford Securities Class Action Clearinghouse</td>
<td>Data on federal class action securities fraud litigation, including prosecutions, defenses, and settlements, as well as supporting documents.</td>
<td>Jan 1, 1996 - Dec 31, 2010</td>
</tr>
<tr>
<td>AAER</td>
<td>Accounting and Auditing Enforcement Releases</td>
<td>Securities Exchange Commission</td>
<td>AAER is a designation assigned by the SEC to administrative proceedings or litigation releases that involve, or will be of interest to, accountants.</td>
<td>July 2, 1975 - Dec 31, 2011</td>
</tr>
</tbody>
</table>
Table 2: Number of events and cases in each database

Panel A reports the number of events in each database, and the corresponding number of unique cases of misconduct. The number of events exceeds the number of cases because some cases have more than one event associated with it. The databases are the Government Accountability Office (GAO) database of restatement announcements, the Audit Analytics (AA) financial restatement database, the Securities Class Action Clearinghouse (SCAC) database of securities class action lawsuits, and the Securities and Exchange Commission’s series of Accounting and Auditing Enforcement Releases (AAERs). The Federal Securities Regulation (FSR) database includes all cases from 1978–2011 for which the SEC and/or Department of Justice brought action for financial misrepresentation under Section 13(b) of the Securities Exchange Act of 1934. Panel B reports on the composition of events in the FSR database. “Number of events” associates each of the 10,415 events, corresponding to 8,787 unique event dates, in the FSR database. There are three types of SEC Enforcement Releases: (i) Litigation Releases concerning civil injunctive actions; (ii) Administrative Proceedings consisting of releases issued under authority granted by the Securities Act of 1933, Securities Exchange Act of 1934, Investment Company Act of 1940, Investment Advisors Act of 1940, or the Public Utility Holding Company Act of 1935; and (iii) Administrative Law Judges’ Initial Decisions and Orders. “Other regulatory events” include Self-Regulatory Organizations (SRO) trading halts; SEC news releases, and DOJ civil and criminal lawsuit filings and decisions. “Other press releases and material announcements” include the initial announcements of the misconduct that prompts enforcement action, and announcements of informal inquiries, formal investigation and Wells Notices from the SEC.

### Panel A: Events and cases in each database

<table>
<thead>
<tr>
<th></th>
<th>GAO</th>
<th>AA</th>
<th>SCAC</th>
<th>AAER</th>
<th>FSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of events in the database</td>
<td>2,707</td>
<td>11,001</td>
<td>3,421</td>
<td>3,568</td>
<td>10,415</td>
</tr>
<tr>
<td>Number of events associated with a case in which there is a 13(b) violation for financial misrepresentation</td>
<td>427</td>
<td>239</td>
<td>389</td>
<td>2,865</td>
<td>10,415</td>
</tr>
<tr>
<td>Number of unique cases in the database</td>
<td>2,321</td>
<td>8,358</td>
<td>3,116</td>
<td>1,356</td>
<td>1,099</td>
</tr>
<tr>
<td>Number of cases in which there is a 13(b) violation</td>
<td>290</td>
<td>188</td>
<td>346</td>
<td>939</td>
<td>1,099</td>
</tr>
</tbody>
</table>

### Panel B: Composition of the FSR database

<table>
<thead>
<tr>
<th>Event type:</th>
<th>Number of events</th>
<th>Unique event dates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Per case</td>
</tr>
<tr>
<td>a Restatement announcements</td>
<td>1,442</td>
<td>1.31</td>
</tr>
<tr>
<td>b Securities class action lawsuits</td>
<td>615</td>
<td>0.56</td>
</tr>
<tr>
<td>c Securities class action settlements</td>
<td>630</td>
<td>0.57</td>
</tr>
<tr>
<td>d - SEC Enforcement Releases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d - Which include an AAER designation</td>
<td>3,066</td>
<td>2.79</td>
</tr>
<tr>
<td>e - Which do not include an AAER designation</td>
<td>1,445</td>
<td>1.31</td>
</tr>
<tr>
<td>f Other regulatory events</td>
<td>1,298</td>
<td>1.18</td>
</tr>
<tr>
<td>g Other press releases and material announcements</td>
<td>1,919</td>
<td>1.75</td>
</tr>
<tr>
<td>a + g</td>
<td>274</td>
<td>0.25</td>
</tr>
<tr>
<td>d + f</td>
<td>183</td>
<td>0.17</td>
</tr>
<tr>
<td>d + e</td>
<td>75</td>
<td>0.07</td>
</tr>
<tr>
<td>e + f</td>
<td>44</td>
<td>0.04</td>
</tr>
<tr>
<td>b + g</td>
<td>22</td>
<td>0.02</td>
</tr>
<tr>
<td>Other combinations of event types with the same date</td>
<td>60</td>
<td>0.05</td>
</tr>
<tr>
<td>Totals</td>
<td>10,415</td>
<td>9.48</td>
</tr>
</tbody>
</table>
Table 3: Stale revelation dates and scope limitations

This table reports the rates at which each database is subject to errors from misidentifying the initial revelation of misconduct and incomplete records due to scope limitations. The error rates are documented using the subset of all events and cases in each database that are associated with an instance of misconduct that prompted enforcement action by the SEC and/or Department of Justice for financial misrepresentation under section 13(b) of the Securities Exchange Act of 1934. The databases are the Government Accountability Office (GAO) database of restatement announcements, the Audit Analytics (AA) financial restatement database, the Securities Class Action Clearinghouse (SCAC) database of securities class action lawsuits, and the Securities and Exchange Commission's Accounting and Auditing Enforcement Releases (AAERs). The Federal Securities Regulation (FSR) database includes all cases from 1978–2011 for which the SEC and/or Department of Justice brought action for financial misrepresentation under Section 13(b) of the Securities Exchange Act of 1934.

<table>
<thead>
<tr>
<th>Panel A: Staleness of initial revelation dates</th>
<th>GAO</th>
<th>AA</th>
<th>SCAC</th>
<th>AAER</th>
<th>FSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases with 13(b) enforcement action (as reported in Table 2)</td>
<td>290</td>
<td>188</td>
<td>346</td>
<td>939</td>
<td>1,099</td>
</tr>
<tr>
<td>No. days by which the initial event in the database misses the initial revelation of the misconduct</td>
<td>Mean</td>
<td>187</td>
<td>242</td>
<td>150</td>
<td>1,017</td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>-3</td>
<td>-3</td>
<td>-3</td>
<td>-1</td>
</tr>
<tr>
<td></td>
<td>P25</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>594</td>
</tr>
<tr>
<td></td>
<td>P50</td>
<td>14</td>
<td>66</td>
<td>23</td>
<td>991</td>
</tr>
<tr>
<td></td>
<td>P75</td>
<td>218</td>
<td>310</td>
<td>153</td>
<td>1,399</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td>2,242</td>
<td>2,109</td>
<td>2,118</td>
<td>3,286</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Extent of incomplete records due to scope limitations</th>
<th>GAO</th>
<th>AA</th>
<th>SCAC</th>
<th>AAER</th>
<th>FSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases in the database with a 13(b) enforcement action (as reported in Table 2)</td>
<td>290</td>
<td>188</td>
<td>346</td>
<td>939</td>
<td>1,099</td>
</tr>
<tr>
<td>Number of events associated with these cases (as reported in Table 2)</td>
<td>427</td>
<td>239</td>
<td>389</td>
<td>2,865</td>
<td>10,415</td>
</tr>
<tr>
<td>Average number of events in database per case</td>
<td>1.47</td>
<td>1.27</td>
<td>1.12</td>
<td>3.05</td>
<td>9.48</td>
</tr>
<tr>
<td>Number of all types of informational events related to the cases</td>
<td>4,336</td>
<td>2,738</td>
<td>6,556</td>
<td>7,919</td>
<td>10,415</td>
</tr>
<tr>
<td>Average number of events per case</td>
<td>14.95</td>
<td>14.56</td>
<td>18.95</td>
<td>8.43</td>
<td>9.48</td>
</tr>
<tr>
<td>% of all types of events the database captures</td>
<td>9.8%</td>
<td>8.7%</td>
<td>5.9%</td>
<td>36.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of all types of events the database misses</td>
<td>90.2%</td>
<td>91.3%</td>
<td>94.1%</td>
<td>63.8%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Table 4: Errors of omission

This table reports the rates at which each database is subject to three types of errors of omission. Panel A reports on missing same-type events for the cases that the database accurately identifies. Panel B reports on cases of material misrepresentation that the database completely misses, during the sample period that the database covers. Panel C reports on cases that the database misses only because of limitations in its sample period compared to the 1978-2010 period. Panel D reports a summary of all three types of error of omission. The error rates are documented using the subset of all events and cases in each database that are associated with an instance of misconduct that prompted enforcement action by the SEC and/or Department of Justice for financial misrepresentation under section 13(b) of the Securities Exchange Act of 1934. The databases are the Government Accountability Office (GAO) database of restatement announcements, the Audit Analytics (AA) financial restatement database, the Securities Class Action Clearinghouse (SCAC) database of securities class action lawsuits, and the Securities and Exchange Commission's Accounting and Auditing Enforcement Releases (AAERs). The Federal Securities Regulation (FSR) database includes all cases from 1978–2011 for which the SEC and/or Department of Justice brought action for financial misrepresentation under Section 13(b) of the Securities Exchange Act of 1934. To be considered outside of the range captured by the relevant sample period we use the following criteria: for GAO if the regulatory enforcement action was completed prior to the beginning of the sample period or if the violation end date is after the end of the sample period (Regulatory End Date is less than January 1, 1997 or Violation End Date is greater than June 30, 2006); for SCAC if the regulatory enforcement action was completed prior to the beginning of the sample period (Regulatory End Date is less than January 1, 1996); and for AA if the regulatory enforcement action was completed before the beginning of the sample period (Regulatory End Date is less than January 1, 2000).
Table 4: Errors of omission (continued)

<table>
<thead>
<tr>
<th>Panel A: Omitted same-type events within the cases the database identifies</th>
<th>GAO</th>
<th>AA</th>
<th>SCAC</th>
<th>AAER</th>
<th>FSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases with 13(b) enforcement action (as reported in Table 2)</td>
<td>290</td>
<td>188</td>
<td>346</td>
<td>939</td>
<td>1,099</td>
</tr>
<tr>
<td>Total number of same-type events associated with these cases</td>
<td>905</td>
<td>634</td>
<td>425</td>
<td>5,056</td>
<td>10,415</td>
</tr>
<tr>
<td>Number of same-type events identified by the database (as reported in Table 2)</td>
<td>427</td>
<td>239</td>
<td>389</td>
<td>2,865</td>
<td>10,415</td>
</tr>
<tr>
<td>Number of same-type events missed by the database</td>
<td>478</td>
<td>395</td>
<td>36</td>
<td>2,191</td>
<td>0</td>
</tr>
<tr>
<td>% of same-type events missed by the database</td>
<td>52.8%</td>
<td>62.3%</td>
<td>8.5%</td>
<td>43.3%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Omitted cases with at least one same-type event and a 13(b) violation during the database’s time period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of cases that should have been identified</td>
</tr>
<tr>
<td>Cases identified by the database (as reported in Table 2)</td>
</tr>
<tr>
<td>Cases missed by the database</td>
</tr>
<tr>
<td>% cases missed by the database</td>
</tr>
<tr>
<td>Same-type events related to the missed cases within the database's time period</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel C: Omitted cases with at least one same-type event and a 13(b) violation outside of the database’s time period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases outside of the database’s time period</td>
</tr>
<tr>
<td>Same-type events related to the missed cases outside of the database's time period</td>
</tr>
<tr>
<td>% of cases by which database would be expanded by including this additional time period</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel D: Summary of errors of omission for each database, for cases of misconduct with a 13(b) violation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases captured by the database (as reported in Table 2)</td>
</tr>
<tr>
<td>Cases missed within database sample period with at least one same-type event (as reported in Panel B)</td>
</tr>
<tr>
<td>Cases missed outside of database sample period with at least one same-type event (as reported in Panel C)</td>
</tr>
<tr>
<td>Total number of cases with at least one same-type event, 1978-2010</td>
</tr>
<tr>
<td>Total number of same-type events associated with all cases with at least one same-type event, 1978-2010</td>
</tr>
</tbody>
</table>
Table 5: Duplicate or follow-on events

This table reports the rates at which each database contains duplicate, or follow-on, events. The databases are the Government Accountability Office (GAO) database of restatement announcements, the Audit Analytics (AA) financial restatement database, the Securities Class Action Clearinghouse (SCAC) database of securities class action lawsuits, and the Securities and Exchange Commission's Accounting and Auditing Enforcement Releases (AAERs). The Federal Securities Regulation (FSR) database includes all cases from 1978–2011 for which the SEC and/or Department of Justice brought action for financial misrepresentation under Section 13(b) of the Securities Exchange Act of 1934.

<table>
<thead>
<tr>
<th>GAO</th>
<th>AA</th>
<th>SCAC</th>
<th>AAER</th>
<th>FSR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>2,028</td>
<td>87.4%</td>
<td>6,498</td>
<td>77.8%</td>
</tr>
<tr>
<td>2</td>
<td>229</td>
<td>9.9%</td>
<td>1,321</td>
<td>15.8%</td>
</tr>
<tr>
<td>3</td>
<td>43</td>
<td>1.9%</td>
<td>366</td>
<td>4.4%</td>
</tr>
<tr>
<td>4</td>
<td>17</td>
<td>0.7%</td>
<td>124</td>
<td>1.5%</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>0.1%</td>
<td>36</td>
<td>0.4%</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>0.0%</td>
<td>8</td>
<td>0.1%</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>0.0%</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>0.0%</td>
<td>2</td>
<td>0.0%</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>0.0%</td>
<td>13</td>
<td>1.0%</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>0.4%</td>
<td>57</td>
<td>5.2%</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>0.2%</td>
<td>41</td>
<td>3.8%</td>
</tr>
<tr>
<td>12</td>
<td>4</td>
<td>0.3%</td>
<td>56</td>
<td>5.1%</td>
</tr>
<tr>
<td>13</td>
<td>6</td>
<td>0.4%</td>
<td>38</td>
<td>3.5%</td>
</tr>
<tr>
<td>14</td>
<td>4</td>
<td>0.3%</td>
<td>39</td>
<td>3.6%</td>
</tr>
<tr>
<td>15</td>
<td>18</td>
<td>1.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>0.1%</td>
<td>25</td>
<td>2.3%</td>
</tr>
<tr>
<td>17</td>
<td>14</td>
<td>1.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>0.1%</td>
<td>13</td>
<td>1.2%</td>
</tr>
<tr>
<td>19</td>
<td>16</td>
<td>1.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>7</td>
<td>0.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>0.1%</td>
<td>10</td>
<td>0.9%</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>0.1%</td>
<td>9</td>
<td>0.8%</td>
</tr>
<tr>
<td>23</td>
<td>9</td>
<td>0.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>4</td>
<td>0.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td>0.1%</td>
<td>5</td>
<td>0.5%</td>
</tr>
<tr>
<td>26</td>
<td>7</td>
<td>0.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>2</td>
<td>0.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>4</td>
<td>0.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>5</td>
<td>0.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>2</td>
<td>0.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>1</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>1</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>1</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>2</td>
<td>0.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>2</td>
<td>0.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>1</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>1</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>1</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>2</td>
<td>0.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>1</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>1</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>77</td>
<td>1</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>131</td>
<td>1</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Cases | 2,321 | 100% | 8,358 | 100% | 3,116 | 100% | 1,356 | 100% | 1,099 | 100% |
Total Events | 2,707 | 11,001 | 3,421 | 3,568 | 10,415 |
Table 6: False positives using three separate criteria

This table reports the number and rates of false positives in the GAO, AA, SCAC, AAER, and FSR databases using three different criteria. In Panel A, a false positive is defined as an event that is not associated with a case in which the SEC brings enforcement action for financial misrepresentation under section 13(b) of the Securities Exchange Act of 1934. In Panel B, a false positive is defined as a case (cases consist of multiple events) that is not associated with an SEC enforcement action for financial misrepresentation. In Panel C, a false positive is defined as a case that does not have an associated charge of securities fraud under Section 17(a) of the Securities Act of 1933, or 10(b) of the Securities Exchange Act of 1934. Examples of false positives include: restatements that are made because accounting rules changed, lawsuits that have little merit, and AAERs that are not associated with financial misconduct.

<table>
<thead>
<tr>
<th>Panel A: False positives using all events in each database</th>
<th>GAO</th>
<th>AA</th>
<th>SCAC</th>
<th>AAER</th>
<th>FSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events identified in the database (as reported in Table 2)</td>
<td>2,707</td>
<td>11,001</td>
<td>3,421</td>
<td>3,568</td>
<td>10,415</td>
</tr>
<tr>
<td>Events associated with a case that prompts SEC enforcement action (as reported in Table 2)</td>
<td>(427)</td>
<td>(239)</td>
<td>(389)</td>
<td>(2,865)</td>
<td>(10,415)</td>
</tr>
<tr>
<td>False positive N</td>
<td>2,280</td>
<td>10,762</td>
<td>3,032</td>
<td>703</td>
<td>0</td>
</tr>
<tr>
<td>False positive %</td>
<td>84.2%</td>
<td>97.8%</td>
<td>88.6%</td>
<td>19.7%</td>
<td>0%</td>
</tr>
<tr>
<td>Hennes et al. (2009) false positive rate</td>
<td>73.6%</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: False positives using unique cases of misconduct</th>
<th>GAO</th>
<th>AA</th>
<th>SCAC</th>
<th>AAER</th>
<th>FSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases identified in the database (as reported in Table 2)</td>
<td>2,321</td>
<td>8,358</td>
<td>3,116</td>
<td>1,356</td>
<td>1,099</td>
</tr>
<tr>
<td>Subset of cases that prompt SEC enforcement activity (as reported in Table 2)</td>
<td>(290)</td>
<td>(188)</td>
<td>(346)</td>
<td>(939)</td>
<td>(1,099)</td>
</tr>
<tr>
<td>False positive N</td>
<td>2,031</td>
<td>8,170</td>
<td>2,770</td>
<td>417</td>
<td>0</td>
</tr>
<tr>
<td>False positive %</td>
<td>87.5%</td>
<td>97.8%</td>
<td>88.9%</td>
<td>30.8%</td>
<td>0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel C: False positives for researchers identifying financial fraud</th>
<th>GAO</th>
<th>AA</th>
<th>SCAC</th>
<th>AAER</th>
<th>FSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases identified in the database (as reported in Table 2)</td>
<td>2,321</td>
<td>8,358</td>
<td>3,116</td>
<td>1,356</td>
<td>1,099</td>
</tr>
<tr>
<td>Subset of cases with a fraud charge</td>
<td>(246)</td>
<td>(155)</td>
<td>(300)</td>
<td>(729)</td>
<td>(821)</td>
</tr>
<tr>
<td>False positive N</td>
<td>2,075</td>
<td>8,203</td>
<td>2,816</td>
<td>627</td>
<td>278</td>
</tr>
<tr>
<td>False positive %</td>
<td>89.4%</td>
<td>98.1%</td>
<td>90.4%</td>
<td>46.2%</td>
<td>25.3%</td>
</tr>
</tbody>
</table>
Table 7: Valuation-based measures of the importance of the database problems

This table presents evidence on how the database errors affect measures of the impacts of the discovery of financial misconduct. Panel A reports on the effect of error type #1, stale initial revelation dates. Panel B reports on the effect of error type #2 (incomplete records). The databases are the Government Accountability Office (GAO) database of restatement announcements, Audit Analytics (AA) financial restatement database, the Securities Class Action Clearinghouse (SCAC) database of securities class action lawsuits, and the Securities and Exchange Commission's Accounting and Auditing Enforcement Releases (AAERs). The Federal Securities Regulation (FSR) database includes all cases from 1978–2011 for which the SEC and/or Department of Justice brought action for financial misrepresentation under Section 13(b) of the Securities Exchange Act of 1934. *** indicates statistical significance using two-tailed t-tests at the 1% level.

<table>
<thead>
<tr>
<th></th>
<th>GAO</th>
<th>AA</th>
<th>SCAC</th>
<th>AAER</th>
<th>FSR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: One-day market-adjusted returns for the initial event date for cases that include SEC action for a 13(b) violation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Events identified by the database (as reported in Table 2)</td>
<td>427</td>
<td>239</td>
<td>389</td>
<td>2,865</td>
<td>10,415</td>
</tr>
<tr>
<td>Cases identified by the database (as reported in Table 2)</td>
<td>290</td>
<td>188</td>
<td>346</td>
<td>939</td>
<td>1,099</td>
</tr>
<tr>
<td>CRSP data available for the initial event in case</td>
<td>260</td>
<td>137</td>
<td>300</td>
<td>637</td>
<td>944</td>
</tr>
<tr>
<td>Abnormal return using the initial event date provided by the database:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-7.06%***</td>
<td>-4.83%***</td>
<td>-5.43%***</td>
<td>-4.03%***</td>
<td>-14.91%***</td>
</tr>
<tr>
<td>Median</td>
<td>-2.13%***</td>
<td>-1.67%***</td>
<td>-1.21%***</td>
<td>-1.13%***</td>
<td>-7.80%***</td>
</tr>
<tr>
<td>Abnormal return using the correct initial event date using the FSR (combined) database:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-16.17%***</td>
<td>-13.59%***</td>
<td>-18.64%***</td>
<td>-14.69%***</td>
<td>-14.91%***</td>
</tr>
<tr>
<td>Difference:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>9.11%***</td>
<td>8.76%***</td>
<td>13.22%***</td>
<td>10.67%***</td>
<td>0.00%</td>
</tr>
<tr>
<td>Median</td>
<td>1.31%***</td>
<td>2.00%***</td>
<td>6.95%***</td>
<td>4.53%***</td>
<td>0.00%</td>
</tr>
<tr>
<td>Percentage amount by which the database understates the initial date share value reaction:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using means</td>
<td>56%</td>
<td>64%</td>
<td>71%</td>
<td>73%</td>
<td>0%</td>
</tr>
<tr>
<td>Using medians</td>
<td>77%</td>
<td>79%</td>
<td>91%</td>
<td>85%</td>
<td>0%</td>
</tr>
</tbody>
</table>

| **Panel B: Abnormal returns cumulated over all event dates for cases that include SEC action for a 13(b) violation** |
| Cases identified by the database (as reported in Table 2) | 290 | 188 | 346  | 939  | 1,099 |
| CRSP data available for at least one event in the case | 265 | 138 | 300  | 673  | 968  |
| Using all event dates for each case that are available in the database: |     |     |      |      |      |
| Mean                  | -7.82%*** | -4.64%*** | -5.61%*** | -7.49%*** | -39.93%*** |
| Median                | -2.45%*** | -1.87%*** | -1.27%*** | -1.89%*** | -25.51%*** |
| Using all event dates for that case in the FSR (combined) database: |     |     |      |      |      |
| Mean                  | -50.36%*** | -38.38%*** | -57.41%*** | -44.38%*** | -39.93%*** |
| Median                | -35.54%*** | -26.79%*** | -42.33%*** | -29.36%*** | -25.51%*** |
| Difference:           |     |     |      |      |      |
| Mean                  | 42.54%*** | 33.73%*** | 51.80%*** | 36.88%*** | 0.00%    |
| Median                | 28.03%*** | 21.26%*** | 38.22%*** | 22.89%*** | 0.00%    |
| Percentage amount by which the database understates the total change in share value: |     |     |      |      |      |
| Using means           | 84% | 88% | 90%  | 83%  | 0%    |
| Using medians         | 93% | 93% | 97%  | 94%  | 0%    |
Table 8: The effects of false positives on measured abnormal stock returns

This table reports the effects of including false positives from the GAO, AA, SCAC, AAER, and FSR databases on measured abnormal stock returns. In Panel A, a false positive is defined as an event that is not associated with a case in which the SEC brings enforcement action for financial misrepresentation under section 13(b) of the Securities Exchange Act of 1934. In Panel B, a false positive is defined as a case (cases consist of multiple events) that is not associated with an SEC enforcement action for financial misrepresentation. That is, Panel B takes duplicate events into account, and includes only the unique cases of alleged financial misconduct captured by the database. In Panel C, a false positive is defined as a case that does not have an associated charge of securities fraud under Section 17(a) of the Securities Act of 1933, or 10(b) of the Securities Exchange Act of 1934. ***, ** and * indicate statistical significance at p < 0.001, p < 0.01, and p < 0.10.

<table>
<thead>
<tr>
<th></th>
<th>GAO</th>
<th>AA</th>
<th>SCAC</th>
<th>AAER</th>
<th>FSR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: Effects of false positives using all events in each given database</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct positives (all events associated with a case that prompts a 13(b) enforcement action)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of observations (as reported in Table 2)</td>
<td>427</td>
<td>239</td>
<td>389</td>
<td>2,865</td>
<td>10,415</td>
</tr>
<tr>
<td>Observations with CRSP data</td>
<td>389</td>
<td>166</td>
<td>334</td>
<td>1,571</td>
<td>6,545</td>
</tr>
<tr>
<td>Mean one-day abnormal return</td>
<td>-5.43%***</td>
<td>-3.86%***</td>
<td>-5.05%***</td>
<td>-3.21%***</td>
<td>-6.52%***</td>
</tr>
<tr>
<td>Median one-day abnormal return</td>
<td>-1.34%***</td>
<td>-1.38%***</td>
<td>-1.14%***</td>
<td>-0.96%***</td>
<td>-1.58%***</td>
</tr>
<tr>
<td>False positives (all other events)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>2,280</td>
<td>10,762</td>
<td>3,032</td>
<td>703</td>
<td>0</td>
</tr>
<tr>
<td>Observations with CRSP data</td>
<td>2,017</td>
<td>4,352</td>
<td>2,426</td>
<td>136</td>
<td>0</td>
</tr>
<tr>
<td>Mean one-day abnormal return</td>
<td>-1.36%***</td>
<td>-0.69%***</td>
<td>-0.82%***</td>
<td>-2.83%*</td>
<td>n/a</td>
</tr>
<tr>
<td>Median one-day abnormal return</td>
<td>-0.69%***</td>
<td>-0.26%***</td>
<td>-0.25%***</td>
<td>-0.46%***</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Panel B: Effects of false positives using all unique cases in each given database</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct positives (using the first event associated with a unique case that prompts 13(b) action)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of observations (as reported in Table 2)</td>
<td>290</td>
<td>188</td>
<td>346</td>
<td>939</td>
<td>1,099</td>
</tr>
<tr>
<td>Observations with CRSP data</td>
<td>264</td>
<td>137</td>
<td>301</td>
<td>652</td>
<td>944</td>
</tr>
<tr>
<td>Mean one-day abnormal return</td>
<td>-6.93%***</td>
<td>-4.83%***</td>
<td>-5.42%***</td>
<td>-3.98%***</td>
<td>-14.91%***</td>
</tr>
<tr>
<td>Median one-day abnormal return</td>
<td>-2.08%***</td>
<td>-1.67%***</td>
<td>-1.23%***</td>
<td>-1.13%***</td>
<td>-7.80%***</td>
</tr>
<tr>
<td>False positives (using the first event in all other cases)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>2,031</td>
<td>8,170</td>
<td>2,770</td>
<td>417</td>
<td>0</td>
</tr>
<tr>
<td>Observations with CRSP data</td>
<td>1,785</td>
<td>3,359</td>
<td>2,251</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Mean one-day abnormal return</td>
<td>-1.38%***</td>
<td>-0.66%***</td>
<td>-0.90%***</td>
<td>-3.07%*</td>
<td>n/a</td>
</tr>
<tr>
<td>Median one-day abnormal return</td>
<td>-0.42%***</td>
<td>-0.27%***</td>
<td>-0.25%***</td>
<td>-0.33%*</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Panel C: Effects of false positives for researchers identifying financial misrepresentation and fraud</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct positives (using the first event in each unique case that has an associated financial fraud charge)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>246</td>
<td>155</td>
<td>300</td>
<td>729</td>
<td>821</td>
</tr>
<tr>
<td>Observations with CRSP data</td>
<td>222</td>
<td>108</td>
<td>258</td>
<td>478</td>
<td>692</td>
</tr>
<tr>
<td>Mean one-day abnormal return</td>
<td>-7.42%***</td>
<td>-5.08%***</td>
<td>-6.03%***</td>
<td>-4.60%***</td>
<td>-17.34%***</td>
</tr>
<tr>
<td>Median one-day abnormal return</td>
<td>-2.28%***</td>
<td>-1.73%***</td>
<td>-1.25%***</td>
<td>-1.19%***</td>
<td>-10.39%***</td>
</tr>
<tr>
<td>False positives (using the first event in all other non-fraud cases)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>2,075</td>
<td>8,203</td>
<td>2,816</td>
<td>627</td>
<td>278</td>
</tr>
<tr>
<td>Observations with CRSP data</td>
<td>1,827</td>
<td>3,388</td>
<td>2,294</td>
<td>274</td>
<td>252</td>
</tr>
<tr>
<td>Mean one-day abnormal return</td>
<td>-1.45%***</td>
<td>-0.69%***</td>
<td>-0.92%***</td>
<td>-2.56%***</td>
<td>-8.23%***</td>
</tr>
<tr>
<td>Median one-day abnormal return</td>
<td>-0.43%***</td>
<td>-0.28%***</td>
<td>-0.27%***</td>
<td>-0.72%***</td>
<td>-3.13%***</td>
</tr>
</tbody>
</table>
Figure 1a. Timeline of incremental information events in the Brocade Communications case of financial misrepresentation
Figure 1b. Timeline of incremental information events in the Professional Transportation case of financial misrepresentation
Figure 2. Time periods covered by each of the databases

The timeline depicts the time periods covered by the databases that are commonly used to identify or examine financial misconduct or restatements. These include the Government Accountability Office (GAO) database of restatement announcements, the Audit Analytics (AA) financial restatements database, the Securities Class Action Clearinghouse (SCAC) database of securities class action lawsuits, the Securities and Exchange Commission's Accounting and Auditing Enforcement Releases (AAERs), and the Federal Securities Regulation (FSR) database of cases in which the SEC and/or Department of Justice brought action for financial misrepresentation under Section 13(b) of the Securities Exchange Act of 1934. The AA and SCAC databases are truncated at December 31, 2010 and the AAER and FSR databases are truncated at December 31, 2011 for purposes of our analyses. *AAER-1 retroactively reported on releases that would have received a secondary AAER designation from September 24, 1971 through April 15, 1982 if the designation had been in place during that time.
Figure 3. Distribution of initial revelation date event types for 1,099 cases

Pie chart displaying the distribution of types of events that provide the initial revelation date for the 1,099 cases of financial misconduct captured by the FSR database. 1,255 events related to 1,099 cases of misconduct are presented because more than one type of event occurs simultaneously on the initial revelation date for 156 cases.
Figure 4. Errors in identifying the initial public revelation date of misconduct by database

Histograms plotting the number of days by which each case of misconduct with a Section 13(b) violation (e.g., the instances of financial misrepresentation captured by the FSR database) identified by each database lags the initial public revelation date of the misconduct.
Appendix A: Papers that rely on the major financial misconduct databases

**AA Restatements Database**


**AAER Database**


Appendix, page 4
• Wang, T., A. Winton. Competition and corporate fraud waves. Working paper, University of Minnesota. [Also in SCAC list.]


**GAO Database**


**FSR Database**

Appendix, page 7
SCAC Database

- Hab, L.H., M.A. Muller. Capital market consequences of corporate fraud: from infringement to settlement. Working paper, University of Lancaster and WHU.


• Lin, C., Song, F., Z. Sun. The financial implications of corporate fraud. Working paper, Chinese University of Hong Kong and University of Hong Kong.


• Schumann, K. Cross-listed firms and shareholder-initiated lawsuits: the market penalties of securities class action lawsuits against foreign firms. Working paper, University of Tennessee.


• Wang, T., A. Winton. Competition and corporate fraud waves. Working paper, University of Minnesota. [Also in AAER list.]


Appendix B: Database descriptions and coverage periods

This appendix describes four databases commonly used in financial misconduct research (GAO, AA, SCAC, and AAER) and the more comprehensive Federal Securities Regulation (FSR) database we construct for purposes of this paper. We delineate each database’s period of coverage, and how the GAO, AA, SCAC, and AAER databases relate to the FSR database. Table 1 and Table 2 summarize this information.


Between 2002 and 2006, the U.S. Government Accountability Office (GAO) issued three reports that identified a large sample of financial restatements that academic researchers have used extensively. The reports were conducted at the request of Senator Paul Sarbanes, and strive to: “(1) determine the number of, reasons for, and other trends in financial statement restatements since 1997; (2) analyze the impact of restatement announcements on the restating companies’ stock market capitalization; (3) research available data to determine the impact of financial statement restatements on investors’ confidence in the existing U.S. system of financial reporting and capital markets; (4) analyze SEC enforcement actions involving accounting and auditing irregularities; and (5) describe the major limitations of the existing oversight structure and steps that have been and are being taken to ensure the integrity of corporate financial disclosures and ongoing challenges” (GAO 2002, p. 1-2).

The first report identified 919 restatements by 845 firms (689 publicly traded) that “involved accounting irregularities resulting in material misstatements of financial results” (GAO 2002, p. 2). The restatements were identified by Lexis-Nexis keyword
searches for variants of “restate,” then screened with the intent of removing restatements unrelated to correcting accounting standards application mistakes. Additional information about the 919 restatement announcements (including the date of the announcement) was issued in GAO Report 03-395R.

GAO Reports 06-678 and 06-1053R extended the original report through June 30, 2006. The restatement announcements added through these two reports were identified by Lexis-Nexis “US Newspapers and Wires” database keyword searches for variants of “restate,” “adjust,” “amend,” and “revise” within 50 words of “financial statement” or “earning” (GAO 2006a, p.52). In aggregate, the three reports include a total of 2,705 restatement announcements spanning 9½ years (January 1, 1997 through June 30, 2006).

Hennes, Leone, and Miller (2008) cull the 2,705 GAO restatements classifying 715 as “irregularities” based on their search for (1) the presence of the word “fraud” or “irregularity” in the restatement announcement; (2) whether the SEC or DOJ conducted an investigation related to the restatement; or (3) whether other investigations into the accounting matter (i.e., the hiring of a forensic accounting firm) were conducted. They recognize the need to adjust for multiple restatements per firm (per enforcement action) and pointedly avoid referring to these 715 announcements as “fraud” events, using the more inclusive term “irregularities.” They note that the legal distinction between the two terms is blurred in practice and the literature by auditing guidelines (e.g., SAS No. 82, AICPA 1997) (that) use the term “fraud” to refer to all intentional misstatements (footnote 1).
App. A.2. Audit Analytics (AA) financial statement restatements database

As of August 29, 2011, the restatement database compiled and maintained by Audit Analytics (the research arm of the Ives Group, Inc.) includes 11,001 financial restatements and/or non-reliance filings made by any SEC registrant since January 1, 2000.\(^{23}\) Audit Analytics (AA) defines a restatement as “an adjustment to previously issued financial statements as a result of an error, fraud, or GAAP misapplication [and] does not include restatements caused by adoption of new accounting principles or revisions for comparative purposes as a result of mergers and acquisitions.”\(^{24}\)

AA extracts its data principally from SEC Form 8-K or required amended periodic reports (Forms 10-K/A, 10-Q/A, 10KSB/A, 20-F/A, and 40-F/A). AA claims to analyzed all 8-K and 8-K/A filings that contain “Item 4.02 - Non-Reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review” since August 2004.\(^{25}\) In addition, all amended Forms 10-K/A, 10-Q/A, 10KSB/A, 20-F/A, and 40-F/A are reviewed to determine if the amendment is due to a restatement, and all audit opinions are searched for derivatives of the word “restate” with the intent of detecting the so-called “stealth” restatements contained in periodic reports rather than event filings.

Audit Analytics describes its data collection methodology as follows:

“After beginning a record that identifies a restatement cause or issue, we subsequently attach filings that address or add information to that original record, in essence creating a history for it. Generally, we consider such a history of filings to be one restatement. In certain circumstances, however, a company clearly identifies a completely new issue in a subsequent filing, and therefore this new issue is treated

\(^{23}\) Beginning August 15, 2004, the SEC requires firms to file Form 8-K Item 4.02 whenever previously issued annual and interim financial statements should no longer be relied upon.

\(^{24}\) This definition was provided in an email from an Audit Analytics analyst on November 15, 2011.

as a new restatement. For example, if a company files an 8K indicating a revenue recognition problem, but then files an ensuing 10K/A that discloses not only a revenue recognition issue, but also a Cash Flow Statement (FAS 95) issue, then a separate and second record is created to track that newly disclosed restatement issue as a distinct restatement. We do not, however, identify the revenue recognition issue in the second restatement so as not to double count the restatement issues in this process. Generally, the intent is to err on the side of combining new disclosures (such as a change in period or amounts) in restatements unless it is clear that the issues are different.\textsuperscript{26}

The AA database identifies the firm and the date on which Form 8-K, Item 4.02 (Non-Reliance on Previously Issued Financial Statements), or a Related Audit Report, or a Completed Interim Review was filed with the SEC. Also reported are the beginning and ending dates of the period to be restated and the AA analyst’s opinion of whether the restatement will have a positive or negative impact on the firm’s financial statements and whether the restatement disclosure identified: accounting rule application failures, financial fraud / irregularities / misrepresentations, accounting and clerical application errors, or other issues as the reason for the restatement.

\textit{App. A.3. Securities Class Action Clearinghouse (SCAC) database}

The SCAC database provides public information about federal class action securities fraud litigation. Coverage begins in 1996, following the passage of the Private Securities Litigation Reform Act (PSLRA) of 1995. Each SCAC record:

identifies a defendant or defendants that are being sued in Federal Court by shareholders of the same issuer, or issuers, for the first time in violation of Federal Securities Laws. In other words, if two or more securities class action complaints against the same defendant, or defendants, have the same underlying allegations, there is only one record in our database. Accordingly, when a case arises out of the same subject matter as one of the actions first filed and is brought by shareholders of the same issuer, or issuers, it is hereafter part of that record ... as a general rule, we select the first complaint we have identified. If multiple complaints are filed at one time, we choose the complaint that appeared to contain the most detailed

\textsuperscript{26}http://www.alacra.com/acm/2033_sample.pdf, page 3.
allegations...we [do not] track SEC enforcement proceedings when there is no parallel federal civil class action” (emphasis added).  

The last phrase is emphasized because it explains the relatively small overlap between the SCAC database and the FSR database (i.e., many SEC enforcement proceedings prompt no federal civil class actions. As of December 31, 2010, the SCAC database contained information relating to 3,227 issuers named in federal class action securities fraud lawsuits. 

App. A.4. Accounting and Auditing Enforcement Releases (AAER) database

In 1982, the SEC began assigning a new secondary designation to some of its enforcement releases if the proceeding involved accountants. The first AAER (AAER-1) states that:

(f) future Commission releases announcing enforcement actions involving accountants will be issued as Accounting and Auditing Enforcement Releases (AAER). Henceforth, interested persons will be able to easily distinguish enforcement releases involving accountants from releases in which the Commission announces the adoption or revision of rules related to financial reporting or discusses its interpretive views on financial reporting matters.”  

Labeling an SEC enforcement action as an AAER is a discretionary SEC staff decision – no standard protocol exists for this determination. As of December 31, 2010, the SEC had issued 3,610 administrative proceedings and litigation releases with a secondary AAER designation. AAER-3222 is the 3,610th AAER because releases sometimes involve two or more actions distinguished by letter suffixes (i.e. AAER-1A, AAER-1B, etc.) and several AAER numbers were assigned erroneously to separate enforcement actions.  

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