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Enforcement Waves and Spillovers

Finance Working Paper N° 835/2022
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Abstract

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Keywords: SEC, misrepresentation, fraud, enforcement, market efficiency

JEL Classifications: G38, K22, L51, M48

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Enforcement waves and spillovers*

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1. Introduction

Well-functioning securities markets require investor trust in firms' financial reports. In the U.S., the Securities and Exchange Commission (SEC) and Department of Justice (DOJ) are tasked to bolster such trust by disciplining firms that misrepresent their financial statements. This paper documents and examines the consequences of an important feature of enforcement activity, that many enforcement actions for financial misrepresentation occur in industry-specific waves. We examine firms' price dynamics within enforcement waves, show how information spillovers affect the share values of industry peer firms during waves, and examine the determinants of waves.

Using an amended version of Harford's (2005) method to identify merger waves, we find that one-quarter of all enforcement actions initiated by the SEC or DOJ for misrepresentation are clustered in 27 industry-specific waves (in 21 different industries) during our sample period of 1978-2015. As examples, the microchip industry experienced a wave of enforcement actions targeting 19 different firms during the 42-month period from August 2004 to January 2008, and the pharmaceutical industry experienced a wave of 16 targeted firms from 2001-2005.

Figure 1 illustrates the pattern of returns when firms are targeted for enforcement action during waves. The first firm in an enforcement wave experiences an abnormal stock return that averages –19.3% on the day its misconduct is revealed. There is a spillover on other firms in the same industry, which experience an average abnormal stock return of –0.30% on the same day. Subsequent targets in the enforcement wave have successively smaller drops in share values and smaller spillover effects on other firms in the same industry. By the end of the wave, newly targeted firms experience relatively small drops in share values (–13.2%) and the spillover effects on other firms are close to zero.

[Insert Figure 1]

Whether a firm is targeted for enforcement action during a wave, and when it is targeted within a wave, affects the timing of its share price reaction to news of its financial misconduct. But it does not affect the total impact on share value. This finding is illustrated in Figure 2, which plots the average cumulative abnormal stock returns for early wave versus late wave firms in the 252 trading days before they are targeted

for enforcement action for financial misrepresentation. Over the full 252-day period, the average cumulative abnormal stock returns for early wave and late wave firms are roughly equal (–31.9% and –31.5%, respectively). But the time paths by which the firms reach that end result differ. Firms that are targeted in the first half of a wave experience relatively large stock price drops when news of the firm's misrepresentation is first publicly revealed (–16.4%). Firms that are targeted later in the second half of a wave have a smaller stock price drop when their misrepresentation is revealed (–11.9%). But these late wave targets have more negative pre-announcement downward drift, reflecting more information spillovers as their industry peer firms are targeted for enforcement action. When we add the cumulative effect of prior spillovers to the initial revelation of misconduct at a firm late in the wave, the total effect on the firm's share price is similar to the total share value loss for early wave firms.

[Insert Figure 2]

This discovery of enforcement waves and wave-related spillovers shows that a firm's market price adjusts not only to news that the firm is the target of an enforcement action, but also to its expected cost of future targeting when its industry peer firms are targeted for enforcement action. These findings extend previous discoveries that enforcement activities have spillover effects and have four implications for our understanding of enforcement activity and its effect on firms' values.[1] First, the fact that many enforcement actions occur in waves implies that the timing and frequency of such actions are not, in general, independent events, as is generally assumed in tests involving corporate misconduct.[2] Second, the short-term share price impact of an enforcement action on the targeted firm, and its spillover effects on industry peers, depend on whether the action is part of a wave and the firm's position in its industry's enforcement wave. Third, short-

[1] Goldman, Peyer, and Stefanescu (2012) and Lel, Martin, and Qin (2022) find that enforcement actions have negative spillover effects on firms beyond the targeted firm, and Gande and Lewis (2009) find spillover effects on related firms when a firm is targeted in a class-action lawsuit. Rincke and Traxler (2011) document a different type of spillover from law enforcement, showing that detections of TV license fee violations increases TV license fee compliance among nearby households. Wilson (2016) documents industry waves and spillover effects in CEO turnover and turnover-performance sensitivity.

[2] See Amiram et al. (2018, especially section 4.2) for a survey of the extensive literature that examines the share price reaction to financial misrepresentation. All of the papers cited in the survey construct measures under the assumption that announcements that reveal misrepresentation are independent of each other.

window event study measures of the share value loss from a firm's misconduct are lower-bound estimates, particularly for firms that are targeted late in an enforcement wave. Fourth, the total impact on firm value is not significantly related to whether the firm is targeted at the beginning or end of a wave. Together, these results indicate that share prices efficiently incorporate changes in the probability that a firm will face enforcement action for financial misconduct, even though the short window share price changes frequently understate the impact of revealed financial misconduct.

Finally, we examine potential explanations for enforcement waves. We find that the intra-wave pattern is not due to a tendency by regulators to target more serious cases of misconduct toward the beginnings of waves. Rather, it reflects time-varying changes in firms' tendencies to violate financial reporting rules, as enforcement waves tend to be preceded by industry-based clusters of reporting violations. This finding is consistent with arguments by Povel, Singh, and Winton (2007), Hazarika et al. (2012), and Wang and Winton (2021) that there are strong industry components to firms' reporting practices and tendencies to engage in misrepresentation. The likelihood of a wave-related enforcement action is also related to increases in the SEC's enforcement budget, suggesting that the SEC applies incremental resources to exploit industry-specific scale economies in its enforcement efforts. We do not find evidence that enforcement waves are more likely to occur during recessions, nor that waves are highly correlated with the SEC's stated areas of enforcement priority. We infer that enforcement waves are more likely to arise from ex post revelations of misconduct than from the SEC's stated enforcement priorities.[3]

This paper proceeds as follows. Section 2 reports on the data used to examine enforcement actions and waves. Section 3 explains our procedure to identify waves and evidence of 27 such waves from 1978–2015. Section 4 examines target firms' share value losses associated with enforcement actions in and out of waves, and at the beginning and end of waves. Section 5 examines the spillover effects on the target

[3] This inference is consistent with SEC enforcement officials' claims that enforcement activities "follow the evidence." For example, "...Brockmeyer did indicate that 'very occasionally' the SEC does engage in industry sweeps, but 'not as often as people think' ... Duross agreed that following the evidence in one particular case to perhaps another company is *not* an 'industry sweep,' it is simply following the evidence" (http://fcpaprofessor.com/category/industry-sweeps/).

firms' peers. Section 6 shows that waves reflect the tendencies of both reporting violations and SEC enforcement budgets to vary over time. Section 7 reports several extensions of our analysis, and Section 8 concludes.

2. Data

To examine enforcement waves and spillover effects, we use a hand-collected database consisting of all 1,286 regulatory enforcement actions initiated by the SEC or DOJ that include charges for violating one or more of the §13(b) provisions of the 1934 Securities Exchange Act (15 U.S.C. §78m) or related rules of Federal Regulations (17 CFR §13b-2) from 1978–2015. These provisions require firms to keep accurate books and records and to maintain a system of adequate internal accounting controls. We use all 1,286 enforcement actions to identify enforcement waves. Our tests for the effects of waves and spillovers require CRSP and Compustat data on stock returns and firm characteristics, decreasing the sample size in some tests to 865.

Figure 3 illustrates a typical sequence of events that comprise the enforcement actions in our sample. Most enforcement actions follow a conspicuous trigger event that signals potential misconduct and attracts regulators' scrutiny. Common trigger events include self-disclosures of malfeasance, executive departures, restatements, withdrawn auditor opinions, auditor departures, and unusual trading. Following a trigger event, regulators gather information through informal inquiry and/or formal investigation. Once the SEC determines the evidence is sufficient to begin formal enforcement proceedings, it may issue Wells Notices to intended targets initiating the Wells Process and providing targets the opportunity to respond to the information gathered in the investigation (there is no similar process at the DOJ.) The SEC can seek administrative remedies through SEC Administrative Law Judges and/or injunctive remedies through federal courts. The DOJ can independently or in parallel file civil and/or criminal charges through federal courts. The SEC releases information regarding prosecution, findings, and sanctions in a series of public enforcement releases and press releases, while the DOJ's various divisions release information through

press releases.[4] When the SEC or DOJ do not provide court-related information, we gather it directly from U.S. District Courts through PACER (Public Access to Court Electronic Records). These sources provide detailed information on many variables used in our tests, including the period over which the misrepresentation occurred (the violation period), the date the misconduct was first publicly revealed, the date of the initial enforcement proceedings, the characteristics of the misconduct, and the regulatory penalties. For a more complete description of the 13(b) provisions and the nature of the regulatory enforcement process and releases from which we draw our data, see Karpoff, Koester, Lee, and Martin (2017, pp. 137-141).

[Insert Figure 3]

Table 1 reports on the one-day market-adjusted return for target firms and their industry peers on the *Initial revelation date*. This is the date when the market first learns about financial misconduct at the target firm, and is defined as the earliest date among the dates associated with the following events (as illustrated in Figure 3): the trigger date identified in the enforcement proceedings, the firm's announcement it has received an informal inquiry from the SEC or received either a formal notice of investigation or subpoenas issued by the SEC or DOJ, the initial SEC Wells Notice or notice of intent of settlement by the firm, and the initial regulatory proceeding. The market-adjusted return is the firm's return minus the CRSP equal-weighted return on the same day. We use SIC codes to assign each firm to one of the 48 Fama-French industry groups. Peer firms are those in the same Fama-French industry.

The mean one-day market-adjusted return for targeted firms is –14.9% with a t-statistic of –25.9, which is consistent with previous findings of large losses in share values when a firm's misconduct is initially revealed (e.g., see Amiram et al., 2018). The mean one-day market-adjusted return for peer firms

[4] In addition to press releases, the SEC provides information about its enforcement activities through Administrative Proceedings under the Securities Act of 1933 (Securities Act Releases), Securities Exchange Act of 1934 (Exchange Act Releases), Investment Advisers Act of 1940 (Investment Adviser Releases), Investment Company Act of 1940 (Investment Company Releases), Public Utility Holding Company Act of 1935 (Public Utility Holding Company Act Releases), or Administrative Law Judge Initial Decision Releases and Administrative Proceedings Rulings (Orders). Information concerning the SEC's injunctive proceedings is provided via press releases and the SEC's Litigation Releases.

is –0.08%, with a t-statistic of –10.6. This result is consistent with findings by Goldman, Peyer, and Stefanescu (2012), who report negative spillover effects on target firms' industry peers.[5]

[Insert Table 1]

Table 1 presents summary statistics for firm and violation characteristics that we use as control variables in tests that investigate firms' stock price dynamics during enforcement waves. Firm financial data are gathered from Compustat, and ownership data are collected manually from filings available through the EDGAR and SEDAR (Alberta Securities Commission) systems. Data on violation characteristics come from SEC and DOJ releases and US District Court filings that provide detailed narratives of the misconduct and associated penalties for each related enforcement action in the sample.

The control variables are motivated by previous evidence that penalties for misconduct are related to violation characteristics. For example, Files, Martin, and Rasmussen (2017) report that penalties for misconduct, and therefore possibly share price losses, tend to be smaller when the target firm is credited by regulators for self-reporting its misconduct (*Self-reported dummy*), cooperating with the investigation (*Cooperation dummy*), or taking remedial action to correct organizational problems that contributed to the misconduct (*Remedial actions dummy*). In addition, Call, Martin, Sharpe, and Wild (2018) find that the firm penalties are negatively related to measures of the severity of the misconduct. We therefore include several measures of misconduct severity, including indicators for whether fraud charges (*Fraud dummy*) and insider trading charges (*Insider trading dummy*) are included as part of the enforcement action, and whether any C-level executives are named as culpable parties (*C-suite dummy*). The rationale for *C-suite dummy* is that misrepresentation that involves senior officers is likely to be pervasive across the organization and reveal a relatively large problem with the firm's internal controls. We also control for *Offense level*, which is a measure of the severity of the misconduct as described in U.S. Sentencing Commission Guidelines. Finally, we count the *Number of regulatory events* that impose sanctions during

[5] Gleason et al. (2008) and Akhigbe and Madura (2008) document spillover effects on industry peers when firms issue an earnings restatement. Some initial revelations of misrepresentation occur via earnings restatements, so these samples partially overlap with the initial revelation dates in our sample.

the enforcement action, and *Legal penalty (ln)*, which is the natural log of the total monetary penalties imposed by regulators. We expect the size of the stock price reaction to news of misrepresentation to be negatively related to these measures of misconduct severity.

In addition, we include several firm characteristics that plausibly could affect the information environment and the stock price reaction to news of misconduct.[6] These include the natural log of market capitalization (*Firm size*), the market-to-book ratio (*M/B ratio*), *Insider ownership, Blockholder ownership*, an indicator variable for firms that are in financial distress (*Distress dummy*), and the number of the firm's employees. The Appendix describes each of these control variables, and Table 3 reports summary statistics on their values inside and outside of waves, and during early wave and late wave periods.

3. Enforcement action waves

We begin by investigating waves in the revelation of misrepresentation that triggers regulatory enforcement. To identify waves, we associate each firm's enforcement action with the date on which the firm's misconduct was first publicly revealed. Previous research shows that this is the date that accounts for the largest share of the firm's share price reaction to news of its misconduct (e.g., Karpoff, Lee, and Martin 2008). To identify enforcement waves, we adapt Harford's (2005) method of identifying merger waves by comparing the actual number of events in a 24-month time interval for an industry with an industry-specific threshold number. To calculate the threshold number, we assume the enforcement action dates within each industry are distributed independently and with equal probability across all months. We then simulate the distribution of the number of such dates in all 24-month periods by randomly assigning enforcement actions across time and counting the number of simulated enforcement action dates in each 24-month period. Repeating this experiment 1,000 times creates an industry-specific distribution of 24-month counts of enforcement action dates. The simulated threshold level is the number of simulated enforcement actions at the 95th percentile of this distribution.

[6] Subsets of these controls are included in tests for the impacts of misconduct on share values and penalties in Gande and Lewis (2009), Murphy et al. (2009), Karpoff and Lou (2010), Goldman et al. (2012), and Lel et al. (2022).

Within each industry and for each month *t* in our sample period, we count the number of enforcement action dates in the 24-month period from month *t* through month *t+23*, and compare that number to the simulated industry-specific threshold number. If for month *t* the actual number of enforcement actions in the time interval [*t, t+23*] is larger than or equal to the simulated threshold number, we identify these enforcement actions as part of an enforcement wave. We repeat this step for the next month, month *t+1*, and add any actions with initial dates in month *t+24* to the group of enforcement actions identified in month *t* as part of a wave, if the actual number of enforcement actions in interval [*t+1, t+24*] is above or equal to the threshold number. We continue adding enforcement actions as part of the wave until the first month *t+s* for which the actual number of actions during [*t+s*, *t+s+23*] drops below the threshold. Let t_1 be the month during which the first of these enforcement actions is initiated, and t_2 be the month during which the last one of this cluster of enforcement actions is initiated. We then define the time interval [t_1, t_2] as the period of the enforcement action wave. Some waves last fewer than 24 months, while others persist for more than 24 months. An industry also can have non-overlapping multiple waves during our sample period.

To illustrate, there are 72 enforcement actions in the chip industry from 1978-2015. Using these 72 actions to simulate 1,000 distributions, the 95th percentile of maximum concentration within any 24-month period is 11 actions, or 15% of the industry total of 72 enforcement actions. A total of 24 (33%) of the 72 enforcement actions in the chips industry occurred within a 42-month period starting in August 2004 and ending in January 2008. By the procedure described above, this cluster of 24 enforcement actions constitute one 42-month wave.

[Insert Table 2]

Table 2 reports the results of this procedure for all Fama-French industries. In total, there are 27 enforcement waves in 21 different industries during the 1978-2015 period. A disproportionately large number of the enforcement actions that occur in these industries are parts of enforcement waves. There are 11.93 enforcement actions during an average 24-month wave period in these 21 industries, compared to 1.76 enforcement actions during an average 24-month non-wave period.

Figure 4 illustrates how the waves are distributed across time and industries. The 2001-2006 period experienced the most waves, with five to eight ongoing enforcement waves per year. The length of the waves also varies considerably. The shortest wave lasts for 20 months (in the Medical Equipment industry), while the longest wave (in the Business Services industry) lasts for 85 months. The mean wave length is 32 months and the median is 29 months.

[Insert Figure 4]

We further partition enforcement waves into early wave and late wave periods. The early wave period is defined as the first half of the wave, and the late wave period is the second half. In the chip industry, for example, the period from August 1, 2004 to April 28, 2006 is the early wave period and the period from April 29, 2006 through January 31, 2008 is the late wave period.

4. Enforcement waves and target firm value loss

Our evidence that many enforcement actions for financial misrepresentation occur in industry-specific waves mirrors evidence of waves in other corporate activities, including mergers (Harford 2005; Cai, Song, and Walkling 2011), initial public offerings (Ritter 1984; Lowry 2003), seasoned equity offerings (Baker and Wurgler 2000), and share repurchases (Dittmar and Dittmar 2008). In this section we examine the implications of enforcement waves for the stock price dynamics of firms that are targeted for enforcement action.

4.1.Univariate comparisons

Table 3 presents summary statistics on firms' share price reactions when they are targeted for enforcement during wave and non-wave periods. The one-day average abnormal stock return for enforcement actions that are part of waves is –14.07%, which is not significantly different from that for actions outside of waves (–15.30%). The unconditional mean stock price reaction is thus similar for firms that are targeted as part of a wave and firms targeted outside of a wave. This simple comparison, however, obscures significant differences within waves. The average one-day market-adjusted return is more negative

for firms targeted during the first half of a wave (early wave targets, –16.56%) compared to firms targeted in the second half of a wave (late wave targets, –11.76%) with a p-value on the difference in means = 0.02.

Table 3 also reports on firm and violation characteristics for enforcement actions during wave and non-wave periods. Firms targeted during a wave are larger and have more employees compared to non-wave firms, and have lower insider ownership and blockholder ownership. Wave-related violations are more likely to be accompanied by private lawsuits related to the misconduct, involve more serious offense levels, involve more regulatory proceedings during the enforcement period, and have higher monetary penalties. Wave-related target firms are also more likely to be credited by regulators for cooperating during the investigation and to take remedial actions to address their reporting problems or improve their internal controls. These comparisons indicate wave-related targets are larger and their misconduct is more severe compared to non-wave targets' misconduct, on average. Wave-related targets are also more likely to be credited by regulators for cooperating with the investigation and taking ex post remedial actions.

[Insert Table 3]

The differences in firm and violation characteristics between early wave and late wave targets, in contrast, are mostly insignificant. Early wave targets have higher market-to-book ratios than late wave targets. However, they are not significantly larger and are not more likely to commit misconduct that triggers private lawsuits, higher offense levels, or more regulatory events. The most notable difference is that regulators impose somewhat larger monetary penalties on late wave target firms compared to early wave target firms – a surprising result given that early wave targets have more negative stock returns.[7]

In summary, the data in Table 3 indicate that wave-related and non-wave target firms have similar average stock price reactions to news of their misconduct even though these firms and their violations differ in several meaningful ways. Within waves, however, early wave and late wave target firms and violations

[7] Internet Appendix Table IA.1 reports on multivariate tests for the characteristics of wave vs. non-wave and early wave vs. late wave target firms. In the multivariate tests, wave related violations are more likely to include fraud charges and require remedial actions by the targeted firms. Within waves, however, there are no significant differences between the violation characteristics of early wave and late wave target firms.

have mostly similar characteristics – except that early wave target firms' share price reactions are more negative compared to late wave targets.

4.2. Multivariate tests

This section reports on multivariate tests that examine cross-sectional differences in target and peer firms' stock price reactions to news of the target firms' financial misrepresentation. In Panel A, the dependent variable is *AR[0]*, the abnormal stock price reaction on the revelation date. In Panel B, the dependent variable is the 3-day cumulative abnormal return, *CAR[–1,+1]*. In each panel, Models 1 and 2 in Table 4 focus on the difference between wave-related and non-wave related enforcement actions, and Models 3 and 4 examine differences between early wave and late wave enforcement actions. All models estimate industry clustered standard errors, and Models 2 and 4 include industry fixed effects.

[Insert Table 4]

The coefficients for the wave-related dummy variables yield inferences that are similar to the univariate comparisons in Table 3. Models 1 and 2 show that, even controlling for firm and violation characteristics, the share price reaction for wave-related cases is not significantly different from that for non-wave cases. Models 3 and 4, however, show that late wave cases have significantly less negative stock price reactions than early wave cases.

The results for the control variables in Table 4 shed additional light on the factors that influence firms' abnormal returns. The abnormal stock return is positively related to firm value and negatively related to the firm's market-to-book ratio and the *Distress dummy*, indicating that small firms, growth firms, and financially distressed firms experience relatively large losses in share values. The abnormal return is negatively related to dummy variables for *Fraud* and *Private lawsuit*, indicating that share value losses are larger for more egregious cases of misconduct. The negative coefficient for *C-suite dummy* indicates that share value losses are relatively large for misconduct that involves one or more senior executive. Insider trading is criminal fraud, so the positive coefficient for the *Insider trading dummy* indicates that, among

misrepresentation violations that include fraud charges, the losses are relatively small when at least one insider also is charged with insider trading.

The main result on which we focus, however, is that early wave enforcement actions are associated with significantly more negative stock price reactions than late wave actions. This pattern is robust in both univariate comparisons and in multivariate tests that control for firm and violation characteristics.

5. Spillover effects in enforcement waves

5.1. Peer firm stock price reactions in and out of waves

To explore information spillover effects within a wave, we begin by measuring the effects on a firm's industry peers' values when its misconduct is first publicly revealed. Industry peers are defined as all CRSP-listed firms that are in the same Fama-French 48 industry as the target firm as of the target firm's revelation date. On the revelation day for each target firm *i,* we calculate the market-adjusted abnormal return (AR_{ij}) for all peer firms *j* in the same industry as firm *i*. Our sample consists of 441,648 distinct *i-j* pairs.

[Insert Table 5]

As reported in Panel A of Table 5, the average stock price reaction of peer firms across all initial enforcement targetings is –0.082%. As reported in Panel B, however, the average obscures a significant difference between wave-related and nonwave-related enforcement actions. The average spillover effect is significantly negative for wave-related actions (–0.185%), but small and statistically insignificant for nonwave-related actions (–0.014%).

These results indicate that investors make different inferences about potential contagion effects for wave-related actions compared to nonwave actions. Wave-related revelations signal that the targeted firm's industry peers are more likely to face future enforcement actions. Investors react to nonwave actions, in contrast, as if these are one-off events that do not significantly increase the likelihood that the targeted firm's peers will also be targeted. Investors' reactions are consistent with subsequent developments, as nonwave targetings turn out to be one-off events, whereas wave-related targetings do presage more targetings of other firms in the same industry.

Panel C of Table 5 reports on information spillovers within waves. Focusing on one day market-adjusted returns, the spillover effect is significantly more negative in the early wave period compared to the late wave period (–0.240% vs. –0.124%). The fact that the spillovers are large particularly at the beginning of waves is consistent with the view that early wave enforcement actions convey more information than late wave targetings about the likelihood that other firms in the industry will face enforcement action. We infer that the spillover effects are relatively small late in the wave because the incremental information about other firms is smaller.

Internet Appendix Table IA.2 provides evidence that spillover effects reflect investors' (rational) expectations about the likelihood of future revelations of financial misconduct in the same industry. We estimate a cross-sectional OLS regression in which the dependent variable is the number of new revelations of misconduct within the target firm's industry over the following 24 months. The key predictor variable is the average spillover effect, i.e., the average return among the target firm's industry peers. The coefficient on this predictor variable is negative and significant, indicating that the number of industry firms facing future enforcement actions is positively related to the magnitude of the spillover effect. Models (2) and (3) in the table show that this effect occurs only during wave periods, particularly early in a wave period. That is, investors discount the share prices of the target firm's industry peers particularly when more enforcement actions actually are forthcoming in the industry.

Panel A of Table 6 reports on multivariate tests that examine cross-sectional determinants of the spillover effect measured using one-day market-adjusted returns, *AR[0]*. Panel B reports similar results using three-day cumulative abnormal stock returns (*CAR[-1,+1]*). The results in both panels are similar to the univariate comparisons in Table 5. For example, Models 1 and 3 report on the difference in spillover effects on industry peers for wave vs. nonwave targetings. Here, the spillover effect is stronger (more negative) among wave-related targetings, as the coefficient for the *Wave dummy* is negative and significant at the 1% level in both Models 1 and 3. Models 2 and 4 report on tests that examine differences between early wave and late wave spillover effects on peer firms. Here, the coefficient on the *Early wave dummy* is

negative and significant in both models. These results indicate that spillover effects on industry peer firms are particularly large for enforcement actions early in a wave.

The negative coefficients on *Peer firm size* in Table 6 indicate that large peer firms experience relatively large (negative) spillover effects. This is the opposite of the correlation between the target firm's size and the target firm's abnormal returns. Whereas large targeted firms experience relatively small declines in share values, large peer firms experience relatively large declines when one of their industry peer firms is targeted for enforcement action. We infer that the probability of a subsequent enforcement action increases or becomes more salient particularly for large peer firms.[8]

[Insert Table 6]

5.2. The total abnormal return to news of misrepresentation including spillover effects

The finding that a firm's revelation date abnormal stock return is related to its prior information spillovers suggests that the total economic impact of the revelation of a firm's misconduct is the sum of its revelation date abnormal return and its prior cumulative spillover effect. In this section we use this insight to further investigate the price dynamics of firms that face enforcement actions within waves.

We begin by computing a conservative measure of a firm's prior cumulative spillover effect. For each firm *j*, we compute its abnormal return, $AR_{ij,}$ on each revelation date of any industry peer firm *i* that is targeted during the two-year period immediately before the date of firm *j*'s initial revelation of misconduct. AR_{ij} is firm *j*'s spillover effect upon the revelation of firm *i*'s misconduct. The sum of all AR_{ij} across all *i* whose revelation dates are within two years before firm *j*'s revelation date is firm *j*'s *Prior cumulative spillover effect*. We choose the two-year cut-off because the median wave length in the sample is

[8] Internet Appendix Table IA.3 reports on extensions of Table 6 that include additional controls for the target and peer firms' characteristics, although with a reduced sample size because of limited data availability. Peer firms' abnormal returns are negatively related to both the target firm's and their own asset intangibility, implying that the spillover effect is larger when the target and peer firms' assets are opaque and relatively difficult to value. Peer firms' abnormal returns are positively related to their number of institutional owners, implying that institutional monitoring is associated with smaller spillover losses.

approximately two years. If there is no prior revelation of misconduct among *j*'s industry peer firms during this two-year window, *Prior cumulative spillover effect* is set to zero.

The mean *Prior cumulative spillover effect* is –1.33% for firms targeted in late wave periods, –0.22% for firms targeted in early wave periods, and –0.16% for out-of-wave targets. The fact that *Prior cumulative spillover effect* is more negative for late wave targets reflects that these firms are subject to a relatively large number of prior information spillovers.

For each firm j, we then compute a measure of the firm's total abnormal return, TAR_j:

$$TAR_j = AR_{j,} + Prior\ cumulative\ spillover\ effect_j$$

where AR_j is firm j's one-day market adjusted return when its misconduct is first publicly revealed. This measure is conservative because it assumes that the spillover effect is limited to the days in which the firm's industry peers are revealed to have engaged in misconduct.

We use TAR_j to test whether the total economic impact on a firm that is caught for financial misconduct depends on whether it is caught as part of a wave, and when it is caught during a wave. Table 7 reports on multivariate regressions that are similar to those in Table 4, except that the dependent variable is each regression is TAR_j instead of AR_j. The results in Models 1 and 3 show that TAR_j is not significantly related to whether the initial revelation of misconduct is part of an enforcement wave. The results in Models 2 and 4 show that, furthermore, TAR_j is not significantly related to the early wave or late wave dummies, whether or not we include controls for firm and violation characteristics.

[Insert Table 7]

These results indicate that – when we incorporate prior spillover effects – a firm's total stock price reaction to the revelation of its misconduct does not depend on whether its revelation is part of an enforcement wave, or whether it is early or late in a wave. Ignoring prior spillovers, the short-window stock price reaction to news of misconduct appears to be relatively small for late wave firms. But this appearance is an artifact of these firms' timing within the wave and the information spillovers from prior revelations of misconduct earlier in the wave. We infer that early and late wave targets do not differ significantly in terms

of the severity or costliness of their misconduct. Rather, investors are simply good at pricing the expectation of misconduct at peer firms when early wave firms' misconduct is revealed.

5.3. Long-run measures of the prior spillover effect

Figure 2 illustrates the longer-term price dynamics of firms that face enforcement action for financial misrepresentation. For each firm in our sample, we measure the cumulative abnormal return for the 252 trading days before its initial revelation (of misconduct) date. Returns are measured relative to firm size and book-to-market ratio benchmarks using Fama-French size and book-to-market benchmark portfolio returns. Specifically, for each day, we sort all CRSP stocks into one of the 25 portfolios sorted by market cap and equity book-to-market ratios. We require four months between the fiscal year end date and the portfolio formation-date. The size and book-to-market adjusted abnormal return is defined as the daily return minus the average returns of all the stocks in the same size and book-to-market ratio ranked portfolio.

Using this abnormal return measure, both early and late wave targets experience similar overall losses during 252 trading days that end on the day their misconduct is revealed (–31.9% and –31.5%, respectively). The timing of these losses differs, however. Early wave targets experience some prior downward drift, particularly in the 30 days before their misconduct is publicly revealed. But much of their total loss occurs on day 0. As reported in Table 8, CAR[-252,-1] = –15.3% for these firms, compared to CAR[0,0] = –16.6%. That is, 52% of the total abnormal return over the total year occurs on day 0. A larger portion of late wave targets' losses, in contrast, occur before day 0. For these firms, CAR[-252,-1] = –20.0%, compared to CAR[0,0] = –11.4%, implying that only 36% of the total abnormal return over the year occurs on day 0. By this measure, 64% of late wave targets' total loss from the revelation of financial misrepresentation occurs via prior information spillovers.

These measures assume that information spillovers occur every day in the year before day 0. As such, they provide a less conservative measure of the spillover effect than the *Prior cumulative spillover effect* measure discussed in Section 5.2, which cumulates abnormal returns only on the days a firm's industry peer firms are discovered to commit financial misrepresentation. Table 8 reports alternative measures of the

spillover and direct effects depending on the length of the event window used to calculate the direct effect. If we measure the direct effect using CAR[-5,0], for example, then 38.3% of early wave target firms' total loss is due to information spillovers, compared to 56.5% for late wave target firms. Regardless of how we separate the prior spillover effect from the direct targeting effect, however, the spillover effect is relatively large for late wave target firms.

[Insert Table 8]

5.4. Spillover effects on uncaught firms

The evidence indicates that enforcement actions have spillover effects on industry peer firms' share values, and that firms that are targeted early or late in enforcement waves experience similar total losses when their prior spillover effects are included. In this section we examine the spillover effects on uncaught firms, that is, firms that do not subsequently face enforcement action for financial misrepresentation.

For each firm *i* that is targeted for enforcement action, we compute cumulative abnormal returns for all industry peer firms *k* that are not subsequently targeted themselves. We use the subscript *k* to denote that these firms are the subset of all industry peer firms that are not subsequently caught. Figure 5 reports the average cumulative abnormal returns for uncaught firms over the 126 trading days after one of their industry peer firms is revealed to engage in misconduct that prompts an enforcement action.

[Insert Figure 5]

One might expect that firms that are not caught would enjoy a price reversal that offsets their initial spillover losses when their peer firms are targeted for enforcement. We find, however, that there is no such reversal. Measured over all targeting events, the average cumulated abnormal return through day +126 is -0.68%. Peer firms' spillover effects are especially large and persistent when their industry peers are targeted in an early part of an enforcement wave, as CAR[-1,126] = –3.33% for these firms.

For comparison, Panel B of Figure 5 reports the cumulative spillover effects for peer firms that are subsequently caught for financial misrepresentation. To avoid including the price impacts of information about these firms' own misconduct, we exclude all firm returns within 21 trading days of the firm's own

public revelation date. The cumulative spillover effect is much more negative for subsequently caught firms than for non-caught firms, especially for early wave period events. For subsequently caught firms, CAR[-1,126] = –9.57% during for early wave period events, –6.38% for late wave period events, and is negligible for events that occur out of a wave.

The Internet Appendix Figure IA.1 reports alternative tests of long-term spillover effects on caught vs. uncaught firms. Wave lengths differ, so we create a standardized wave length by partitioning each wave into 24 equal time intervals, or pseudo-months. For each pseudo-month, we calculate a firm's average daily abnormal return and multiply the daily average by 21 to obtain a pseudo-monthly abnormal return. For firms that are subsequently caught, we exclude returns after day –21 relative to their revelation day. Figure IA.1 plots plot the averages of the cumulative abnormal pseudo-month returns (sum of monthly average abnormal returns) for firms that subsequently are caught in a wave and firms that are never caught. By this measure, subsequently caught firms experience prior spillover effects of –8.11%, whereas non-caught firms experience a cumulative wave-related spillover effect of –2.30%.

In another alternative test reported in Internet Appendix Table IA.4, we estimate OLS regressions that examine the short- and longer-window spillover effects for caught vs. non-caught firms. The dependent variable in each regression is a measure of a firm's return when an industry peer is targeted for enforcement action ranging from one month returns (CAR[-1,21] to half year returns (CAR[-1, 126]). The results show that the spillover effect is larger for firms that subsequently are caught committing financial misrepresentation, and that the difference in spillover effect between caught and uncaught firms increases over time. Furthermore, the largest spillovers occur early in waves and affect firms that eventually are caught later in the wave. These results indicate that the spillover effect is larger for firms that subsequently are caught committing financial misrepresentation, and that the difference in spillover effect between caught and uncaught firms increases over time.

Together, these results provide a fairly complete picture of firms' share price dynamics when enforcement actions occur in waves. The revelation of a firm's financial misconduct creates an information spillover that decreases the values of its industry peer firms. The spillover effect is greatest for firms that

subsequently face enforcement action for misrepresentation themselves, implying that investors can identify firms that are likely to become future targets for enforcement. But spillovers also affect the values of firms that do not subsequently face enforcement action for misrepresentation and these spillovers do not reverse over time. It is possible that spillovers reflect an increased likelihood of misrepresentation, even if these firms are not revealed to have engaged in misrepresentation during our sample period. It also is possible that the spillovers reflect negative information about other aspects of all firms in the industry, perhaps about poor internal controls or financial reporting conventions within the industry.

It is noteworthy that spillover effects are limited to wave-related enforcement actions and do not arise with non-wave actions. In Figure 2, for example, non-wave target firms have an essentially zero average cumulative abnormal stock return in the year before their misconduct is revealed (e.g., CAR[-252,-30] is statistically insignificant). Similarly, in Figure 5, there is no statistically significant spillover on peer firms from non-wave targetings, either for firms that subsequently are targeted themselves or firms that are not targeted in our sample period. We infer that information spillovers are primarily a feature of enforcement waves.

6. What drives enforcement waves?

6.1. Prior violation clusters

In this section we turn to questions of why enforcement waves arise in the first place and why they last as long as they do. Prior research suggests that enforcement waves arise because firms' violations cluster in time. For example, Povel, Singh, and Winton (2007) argue that firms' incentive to commit financial fraud has a common component that is related to the business cycle. Wang and Winton (2021) argue that competitive pressures among peer firms can lead multiple firms in the same industry to engage in similar reporting practices at the same time, some of which may involve misrepresentation. Consistent with this argument, Hazarika et al. (2012) find that accrual management has a strong industry component, implying that firms in each industry follow similar reporting practices that can lead to industry clusters of misrepresentation. These arguments imply that enforcement waves arise because firms' misconduct clusters

in time and within industries. Povel et al. (2007) argue that these clusters also correspond to the business cycle.

We use two different measures of financial misrepresentation violations to investigate whether enforcement waves are preceded by industry clusters of violations. The first measure is based on the violation periods of the firms that are targeted for financial misrepresentation and are in our enforcement action sample. Following the same approach used to detect industry-specific enforcement waves, we use the date on which each firm's violation began, as identified in the enforcement proceedings documents. In each industry, we compute the number of violation initiations during each 24-month period that begins in each month of the sample period, and compare that number to a simulated industry-specific threshold number. The simulated threshold number, in turn, is the 95th percentile in the bootstrapped distribution of violation starts per month using random draws of violation starts from our sample. If the actual number of misconduct initiations is larger than or equal to the simulated threshold number, we identify that month as the beginning of a violation cluster. The violation-cluster end is defined as the month in which the last wave-related misconduct starts.

Table 9 summarizes the results of this procedure. It identifies a total of 25 violation clusters from 1978–2015 in 22 different industries. The violation clusters range in length from 17 to 69 months, with a mean of 34.5 months. Of the 25 violation clusters, 18 are followed by enforcement waves in the same industries. The lag between the end of the violation cluster and the beginning of the subsequent enforcement wave ranges from zero to 68 months, with a mean of 17.3 months.

[Insert Table 9]

This evidence supports the inference that enforcement waves tend to be preceded by industry clusters of misrepresentation violations. A problem with this first measure of violation clustering, however, is that it does not consider violations that are not caught and therefore cannot appear in the sample. To address this issue, we use the F-score as developed by Dechow, Ge, Larson, and Sloan (2011) to identify firms that may be subject to future enforcement actions, including firms that are never caught and do not appear in our sample of enforcement actions. The F-score is the firm-year fitted value from a model that predicts the

existence of financial misreporting based on observable firm characteristics. Using Dechow et al.'s (2011) guidelines, we classify a firm as engaging in financial misrepresentation in a given year if its F-score is greater than or equal to 2.5 for that year. For each industry and year, we tabulate the number of firms with an F-score above 2.5 and repeat our previous wave-identification method to identify violation clusters using the F-score. F-scores are computed using annual financial statement data, so this approach classifies each industry-year, rather than each industry-month, as part (or not part) of an F-score cluster. For each industry, we identify all years in which the fraction of firms in the industry with high F-scores exceeds the threshold number for that industry. Table 10 summarizes the results of this procedure. A total of 27 of the 48 Fama-French industries have at least one year with a cluster of firms with unusually high F-scores. Some industries have many high F-score industry-years.

[Insert Table 10]

We use the violation clusters identified in Table 9 and the F-score clusters summarized in Table 10 to examine whether enforcement waves are associated with prior industry-specific violation clusters. Table 11 reports on 2x2 contingency tables that provide tests of such association. Panel A classifies each of the 1,286 targeted firms in the financial misrepresentation enforcement actions according to whether its violation is part of a violation cluster and whether the revelation of its misconduct is part of an enforcement wave. If violation clustering aligns with subsequent enforcement waves in the same industry, we should observe a higher-than-random concentration along the diagonal of the 2x2 matrix. This is what we find, as the Chi-squared test rejects the null hypothesis that the violation clustering and enforcement activity clustering are unrelated ($\chi 2 = 260.8$, p-value < 0.00). A total of 371 of the violations occur within a violation cluster, while the remaining 915 violations do not. Of the 371 that occur within violation clusters, 232 are associated with enforcement actions that are parts of enforcement waves, and 139 are associated with enforcement actions that are not parts of enforcement waves. Of the 915 of the violations are not parts of violation clusters, 760 are associated with enforcement actions that are not parts of waves and 155 are associated with enforcement actions that are parts of waves.

[Insert Table 11]

Panel B repeats the contingency table analysis using the F-score based clusters. The results are similar as in Panel A. In total, 122 out of 387 (32%) of the firms included in enforcement waves are also in F-score clusters, and 786 out of 899 (87%) of the firms whose enforcement actions are not parts of enforcement waves are also not parts of F-score clusters. The Chi-squared statistic equals 65.09 and is significant at the 1% level.

These results indicate that enforcement waves tend to be preceded by clusters of violations by firms in the same industry, as suggested by results in Povel, Singh, and Winton (2007), Hazarika et al. (2012), and Wang and Winton (2021). The fit is not perfect, however, as many firms that are targeted for enforcement as part of a wave are not part of a prior violation cluster, and many violations occur during clusters that do not precede enforcement waves.[9]

6.2. SEC budget growth

Another possible reason for enforcement waves is that wave-related enforcement activity is related to changes in the SEC's budget. Cox, Thomas, and Kiku (2003) point out that the SEC's enforcement activity is affected by its budget, and Blackburne (2014) notes that it is often cost effective for the SEC to pursue misconduct in multiple firms from the same industry. Such a tendency can be reinforced if SEC staff members develop industry-specific expertise that facilitates investigations and enforcement actions involving multiple firms in the same industry. A tendency to cluster its enforcement activities could also arise from the SEC's organizational structure, as its twelve Disclosure Operations Offices that oversee compliance with disclosure regulations are organized by industry.

To investigate the SEC's role in creating enforcement waves, we first examine whether enforcement activity and wave-related enforcement activity are related to changes in the SEC's budget. If the SEC's budget serves as a binding constraint on enforcement, we should observe a positive relation between the

[9] These clusters of contemporaneous violations differ from the earnings management contagion described by Kedia, Koh, and Rajgopal (2015). Kedia et al. (2015) find that a firm's earnings restatement increases the likelihood that its industry peer firms begin to manage earnings, except when the restating firm is subject to SEC enforcement or private lawsuits.

SEC's budget growth and the number of new SEC-initiated enforcement actions. Furthermore, an increase in new enforcement actions will generate industry-specific waves if the SEC focuses its incremental enforcement activities within industry groups.

To investigate whether the SEC's budget growth affects enforcement activity and waves, we define two new binary variables. *New action*$_{it}$ equals one if a new enforcement action was initiated that targets firm *i* in year *t*. *New wave action*$_{it}$ equals one if a new enforcement action was initiated that targets firm *i* in year *t* and in which the action is part of an enforcement wave. Whereas our previous tests focus on the date on which investors first learn about the misconduct that prompted regulators' attention, here we focus on the date on which enforcement proceedings are first initiated. The enforcement proceedings period is illustrated in Figure 3 and include the filing of civil or criminal charges regarding the misconduct, debarment of officers, trading suspensions, and other administrative and legal proceedings.

Table 12 reports the results of linear probability regressions using annual panel data in which *New action*$_{it}$ or *New wave action*$_{it}$ are the dependent variable and the SEC's budget growth is the key regressor. Data on the SEC's budget is obtained from the SEC's Reports and Publications web page at https://www.sec.gov/reports. Firm data are drawn from all Compustat-listed firm-years from 1978-2015 for which sufficient data are available. We include controls for the firm's size and market-to-book ratio and the firm's F-score as measured in the prior year.

[Insert Table 12]

Panel A of Table 12 reports on newly initiated enforcement actions whether or not such actions are parts of enforcement waves. The results indicate that current-year SEC budget growth, as well as budget growth over the previous two years, are positively related to the initiation of a new enforcement action for financial misrepresentation. Panel B reports on similar tests in which the dependent variable is *New wave action*$_{it}$. The coefficients on current year budget growth and the two previous years' budget growth are all positive, and except for Models 5 and 6, all are statistically significant. These results indicate that the SEC initiates more enforcement activity when it has the additional budget to do so (and/or that the SEC's budget

increases when expected enforcement activities increase), and that it focuses much of its incremental enforcement on wave-related actions.

The coefficients for several of the control variables yield additional insight. The *SOX dummy*, for example, takes the value of one for years 2002-2015 and zero for years before 2002. Previous research indicates that firms' financial reporting became more conservative and earnings management decreased after SOX (e.g., Iliev 2010; Cohen, Dey, and Lys 2008), possibly leading to fewer enforcement actions for financial misrepresentation in the post-SOX period. Contrary to this expectation, however, the coefficient for *SOX dummy* is positive and statistically significant in Model 6 of Panel A (with firm fixed effects). In Model 5 of Panel B (with industry fixed effects) the current year's SEC budget growth is positively related to the initiation of a new wave-related enforcement action in the post-SOX period. However, in Model 6 with firm fixed effects, the coefficients on *SOX dummy* and *SEC budget growth * SOX dummy* are statistically insignificant. These results imply that post-SOX budget growth is associated with more wave-related enforcement actions compared to the sample-wide average for each industry, but not compared to each individual firm's average tendency to attract enforcement actions.

Another finding is that a firm's F-score is negatively related to the likelihood of a new enforcement action or wave-related enforcement action in tests that include firm fixed effects. At first, this result would appear to contradict our findings in Table 11 indicating that high F-score clusters are positively related to subsequent enforcement waves. We infer that the F-score clusters reflect cross-sectional variation in firms' F-scores rather than time-series variation in individual firms' F-scores. That is, the F-score appears to be a decent predictor of misconduct in the cross-section, but time-series variation in an individual firm's F-score is negatively, not positively, related to the contemporaneous likelihood of being targeted for enforcement action.

Finally, prior evidence is mixed on whether SEC enforcement is affected by political connections or geographic proximity to regulators.[10] As a control, we use a variation of Kedia and Rajgopal's (2011)

[10] See Kedia and Rajgopal (2011), Correia (2014), Heese et al. (2017), Parsons et al. (2018), and Heese (2019).

proximity measure, *Distance to regulator office*, which is the distance (in ln(miles)) from the firm's headquarters to the nearest SEC or DOJ regional office. *Distance to regulator office* is insignificant in Panel A and positive and significant only in the Panel B models with firm fixed effects. Only a small number of firms in our sample move their headquarters, but the results with firm fixed effects imply that the likelihood of a new wave-related action increases when a firm moves its headquarters farther from a regulator's field office.

6.3. Other possible drivers of wave enforcement

The main results from Sections 6.1 and 6.2 indicate that that enforcement waves become more likely when industries experience increases in violation clusters and when the SEC has more budget resources to pursue investigations and enforcement activities. In this section we consider other possible drivers of enforcement waves.

One possible driver is the SEC's stated enforcement priorities, as stated in its Annual Reports. For example, in 2014 the SEC announced concentrated efforts "Combating Financial Fraud and Enhancing Issuer Disclosure" that targeted six firms as part of the effort. Such focused efforts are sometimes called enforcement "sweeps."[11] It is possible that enforcement waves arise from such enforcement sweeps.

To investigate this possibility, we use SEC Annual Reports to identify a total of 38 areas of enforcement priority from 2011 through 2015. Internet Appendix Table IA.5 summarizes these 38 sweeps. Most of these sweeps are unrelated to financial misrepresentation by publicly traded companies, including a 2015 sweep aimed at "Uncovering Misconduct by Investment Advisers and Investment Companies" and a 2011 sweep of "Insider Trading Cases." Ten of the 38 sweeps, however, involve one of more financial misrepresentation cases, including two 2015 sweeps aimed at "Combating Financial Fraud and Enhancing Issuer Disclosure" and "Combating Foreign Corrupt Practices." The SEC identifies a total of 68 targeted

[11] See, for example, http://fcpaprofessor.com/category/industry-sweeps/. Relatedly, Jackson and Roe (2009), Thomsen (2009), and Kedia and Rajgopal (2011) argue that U.S. Department of Justice attorneys and SEC enforcement staff select targets and allocate enforcement resources strategically.

firms in these ten sweeps, of which 50 involve charges of financial misrepresentation and therefore appear in our sample. Of these 50 firms, however, only nine are targeted as part of an enforcement wave that we identify. This implies that the SEC's targeted areas of enforcement priority, or sweeps, are largely unrelated to enforcement waves for financial misrepresentation. We infer that the enforcement waves we identify do not arise because the SEC pre-identifies these industries for enforcement. Rather, they arise because of industry clustering in firms' tendencies to commit misrepresentation and are facilitated by increases in the SEC's budget.

Povel et al. (2007) propose that financial fraud increases during economic upturns and tends to be revealed during the ensuing downturns. This suggests that enforcement waves are inversely related to the business cycle. Internet Appendix Table IA.6 reports on tests of this prediction. A Chi-squared test rejects the null hypothesis that enforcement waves are recessions are unrelated at the 5% level; however, the results indicate enforcement waves are less likely, not more likely, to occur during recessions. Consistent with this finding, Table IA.6 also reports that months outside of recessions have a higher mean number of industries experiencing enforcement waves (1.73) than months during a recession (1.15). These results indicate that enforcement waves are more common outside of recessions than during recessions. Despite this tendency, in further tests we find that the patterns of direct and spillover effects on target and peer firms' share values are unrelated to whether the firm's misconduct is revealed during a recession.

6.4. Determinants of wave length

Internet Appendix Table IA.7 reports on characteristics of waves that are longer than the median (i.e., 29 months or longer) compared to waves that are shorter than 29 months. In univariate comparisons, industries that have longer waves have relatively large market capitalizations and low market-to-book ratios. Longer waves target a comparatively large fraction of industry firms and have many cases, and firms that are targeted during long waves have smaller direct stock price losses when they are targeted.

Panel B of Table IA.7 reports on OLS regressions in which the dependent variable is wave length measured in months. Controlling for all firm and industry characteristics simultaneously, the only

statistically significant coefficient is for the number of cases in the wave. We infer that the main driver of wave length is simply the number of firms that ultimately are targeted for enforcement during the wave.

7. Additional analyses

7.1 Alternative industry definitions

Our analysis uses Fama-French 48 industry classifications to identify industry specific enforcement waves. It is likely that the specific waves we identify, and the cases of misrepresentation that are classified as part of a wave, depend on how we group firms into industries. We therefore examine whether our results are robust to an alternative industry grouping by conducting our tests using the Fama-French grouping of 17 industries. The results are summarized in Internet Appendix Table IA.8. Using the same procedure to identify waves described in Section 3 and using the Fama-French 17 industries, we identify a total of 19 waves in 13 different industries. Even though the industry groupings are cruder and the set of industry peer firms is larger, we find returns patterns that are similar to our main results. Late wave targets have smaller short-term share value losses than early wave targets, and spillover effects are larger in early wave periods than in late wave periods.

7.2 Sarbanes-Oxley Act of 2002

Figure 4 indicates that many enforcement waves occur around the time of the Enron and Worldcom scandals in 2001 and 2002, and the Sarbanes-Oxley Act of 2002. To examine whether such events had a significant effect on enforcement waves and wave patterns, we examined whether our results differ between pre-SOX and post-SOX subperiods. For example, Table IA.9 in the Internet Appendix repeats the tests in Table 4, but including *SOX dummy*, which is a binary variable set equal to one for periods before July 2002 and zero otherwise. The coefficient for *SOX dummy* is positive, suggesting that targeted firms experience less negative returns after SOX became law. The main inferences from Table 4, however, persist, as the wave dummy is statistically insignificant and the late wave dummy is positive and statistically significant. Columns 5-8 of Internet Appendix Table IA.9 report on tests that include year fixed effects, which capture

year-specific changes that could affect wave patterns. Again, however, the results are similar to those in Table 4.

7.3. Regulator-initiated revelation of misrepresentation

The enforcement actions in our sample begin when news of a firm's misconduct becomes publicly known. As reported in Internet Appendix Table IA.10, regulators initiated the public revelation of misconduct in 19.7% of the enforcement actions in our sample. The other 81.3% of cases were initially publicized via a combination of firms' public announcements, earnings restatements, private lawsuits, and media reports. A slightly higher-than-average percentage of wave-related enforcement actions were initially publicized by regulators (22%), suggesting that enforcement waves reflect some clustering of enforcement effort by regulators.

It is possible that the direct or spillover effects we document in this paper are affected by whether investors learn about a firm's misconduct from a regulator's action or from another source, such as an earnings restatement. As reported in Internet Appendix Table IA.10, the stock price reaction to misconduct that is publicized by regulators' actions is less negative than when the misconduct is initially revealed through other channels, particularly for early wave targets. Late wave targets' returns are more negative when their misconduct is made public via regulator initiative. These results suggest that late wave target firms experience larger losses if they do not proactively report on their previous misconduct. However, the spillover patterns on peer firms that we emphasize in this paper are unrelated to whether the misconduct is first publicized by a regulator's action.

7.4. Late wave target firms' behavior

Our results indicate that markets can identify whether an enforcement action will lead to more enforcement among firms in the same industry, and which industry peer firms are likely to be targeted as part of the enforcement wave. When an enforcement wave begins, industry firms that have engaged in misrepresentation face an increased risk of being caught and penalized for their misconduct. It is reasonable

to hypothesize that late wave target firms mitigate their expected costs of future enforcement activity by disclosing their misconduct themselves or taking other proactive steps that regulators recognize by granting credit for cooperating with their investigations.

In support of this hypothesis, the univariate comparisons in Table 3 suggest that late wave targets self-report and cooperate more; 11% of late wave targets self-report their misconduct compared to 7% of early wave targets and 10% of non-wave targets. Similarly, 40% of late wave targets receive credit for cooperating with regulators compared to 31% of early wave targets and 22% of non-wave targets. The difference in self-reporting between late wave and early wave targets is not statistically significant, although the difference in cooperation credit has a p-value of 0.07. In multivariate tests that are reported in Internet Appendix Table IA.11, however, there is no robust evidence that late wave target firms are more likely to self-report or receive cooperation credit, or that late wave firms that self-report or cooperate experience smaller share value losses when their misrepresentation is revealed. It is possible that late wave target firms adjust in other waves to mitigate their increased risk of targeting, but it does not appear that they adjust by disclosing proactively or cooperating more with regulators.

8. Conclusions

This paper documents that many regulatory enforcement actions for financial misrepresentation occur in industry-specific waves. Waves do not arise because of macroeconomic downturns and are not closely related to the SEC's stated areas of enforcement priority. Rather, waves arise because firms commit misrepresentation in industry-specific clusters, and they become more likely when the SEC enjoys budget growth. These findings support SEC investigators' claims that they "follow the evidence" generated by clusters of misrepresentation by firms in the same industry, rather than because of any ex ante enforcement priorities.[12]

Wave-related enforcement actions differ from non-wave actions in several ways: they target larger firms, and by several indicators – including penalty size, criminal charges, and the number of regulatory

[12] See footnote 3.

events – more egregious cases of misconduct. This is despite evidence that target firms' share price reactions do not differ significantly between wave-related and non-wave enforcement actions.

The patterns within waves, by contrast, are different. Firms that are targeted early in a wave are by most measures similar, on average, to firms that are targeted late in a wave. Early wave and late wave firms are of similar size; they are roughly equally likely to face private class action lawsuits or criminal charges, and they prompt a similar number of regulatory events. They differ, however, in how their stock prices react to news of their misconduct. Early wave firms experience larger stock price drops, and the revelation of early wave firms' misconduct triggers relatively large negative spillover effects on their industry peer firms' share values. Late wave firms experience smaller share value losses and have smaller spillovers on their industry peer firms.

Information spillovers explain these differences. Late wave targets are subject to information spillovers from earlier in the wave. Early wave and late wave targets experience similar overall losses to news of their misconduct. Because of information spillovers, however, the timing of these losses differ. By one measure, late wave targets experience only 36% of their total loss in share value on the day their misconduct is publicly revealed, because information spillovers cause these firms' prices to fall before the revelation date. These results indicate that share prices adjust to reflect the likelihood that a firm will be targeted for enforcement when its peer firms are targeted during an enforcement wave.

References

Akhigbe, A., and J. Madura, 2008. Industry signals relayed by corporate earnings restatements. *Financial Review* 43, 569–589.

Amiram, Dan, Zahn Bozanic, James D. Cox, Quentin Dupont, Jonathan M. Karpoff, and Richard Sloan, 2018. Financial reporting fraud and other forms of misconduct: a multidisciplinary review of the literature. *Review of Accounting Studies* 23(2), 732-783.

Baker, Malcolm, and Jeffrey Wurgler, 2000. The equity share in new issues and aggregate stock returns. *Journal of Finance* 55(5), 2219–2257.

Blackburne, Terrence, 2014. Regulatory oversight and reporting incentives: Evidence from SEC budget allocations. Available at https://repository.upenn.edu/edissertations/1209/.

Cai, Jie, Moon H. Song, and Ralph A. Walkling, 2011. Anticipation, acquisition, and bidder returns: Industry shocks and the transfer of information across rivals. *Review of Financial Studies* 24(7), 2242-2285.

Call, Andrew C., Gerald S. Martin, Nathan Y. Sharp, and Jaron H. Wilde, 2018. Whistleblowers and outcomes of financial misrepresentation enforcement actions. *Journal of Accounting Research*, 56(1), 123-171.

Cohen, D., A. Dey, and T. Z. Lys, 2008. Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley Periods. *The Accounting Review* 83, 757-787.

Correia, Maria M., 2014. Political connections and SEC enforcement. *Journal of Accounting and Economics*, 57, 241-262.

Cox, James D., Randall S. Thomas, and Dana Kiku, 2003. SEC enforcement heuristics: An empirical inquiry. *Duke Law Journal* 53(2), 737–779.

Dechow, Patricia, Weili Ge, Chad Larson, and Richard Sloan, 2011. Predicting material accounting misstatements. *Contemporary Accounting Research* 28(1), 17–82.

Dittmar, Amy K., and Robert F. Dittmar, 2008. The timing of financing decisions: An examination of the correlation in financing waves. *Journal of Financial Economics* 90(1), 59-83.

Files, Rebecca, Gerald S. Martin, and Stephanie J. Rasmussen, 2019. Regulator-cited cooperation credit and firm value: Evidence from enforcement actions. *The Accounting Review* 94(4), 275-302.

Gande, Amar, and Craig M. Lewis, 2009. Shareholder-initiated class action lawsuits: Shareholder wealth effects and industry spillovers. *Journal of Financial and Quantitative Analysis* 44(4), 823-850.

Gleason, C. A., N. T. Jenkins, and W. B. Johnson, 2008. The contagion effects of accounting restatements. *The Accounting Review* 83(1), 83–110.

Goldman, Eitan, Urs Peyer, and Irina Stefanescu, 2012. Financial misrepresentation and its impact on rivals. *Financial Management* 41(4), 915–945.

Harford, Jarrad, 2005. What drives merger waves? *Journal of Financial Economics* 77(3), 529–560.

Hazarika, Sonali, Jonathan M. Karpoff, and Rajarishi Nahata, 2012. Internal corporate governance, CEO turnover, and earnings management. *Journal of Financial Economics* 104(1), 44-69.

Heese, Jonas, 2019. The political influence of voters' interests on SEC enforcement. *Contemporary Accounting Research* 36, 869-903.

Heese, Jonas, Mozaffar Khan, and Karthik Ramanna, 2017. Is the SEC captured? Evidence from comment-letter reviews. *Journal of Accounting and Economics* 64, 98-122.

Iliev, P., 2010. The Effect of SOX Section 404: Costs, earnings quality, and stock prices. *Journal of Finance*, 65, 1163–1196.

Jackson, Howell, and Mark Roe, 2009. Public and private enforcement of securities laws: Resource-based evidence. *Journal of Financial Economics* 93(2), 207-238.

Karpoff, Jonathan M., Allison Koester, D. Scott Lee, and Gerald Martin, 2017. Proxies and databases in financial misconduct research. *Accounting Review* 92(6), 129-163.

Karpoff, Jonathan M., D. Scott Lee, and Gerald Martin, 2008. The cost to firms of cooking the books. *Journal of Financial and Quantitative Analysis* 43(3), 581-611.

Karpoff, Jonathan M., and Xiaoxia Lou, 2010. Short sellers and financial misconduct. *Journal of Finance* 65(5), 1879-1913.

Kedia, Simi, and Shiva Rajgopal, 2011. Do the SEC's enforcement preferences affect corporate misconduct? *Journal of Accounting and Economics* 51(3), 259-278.

Kedia, Simi, Kevin Koh, and Shiva Rajgopal, 2015. Evidence on contagion in earnings management, *The Accounting Review* 90(6), 2337–2373.

Lel, Ugur, Gerald S. Martin, and Zhongling Qin, 2022. Delegated monitoring, institutional ownership, and corporate misconduct spillovers, *Journal of Financial and Quantitative Analysis*, forthcoming, available at https://ssrn.com/abstract=3358068.

Lowry, Michelle, 2003. Why does IPO volume fluctuate so much? *Journal of Financial Economics* 67(1), 3–40.

Murphy, Deborah L., Ronald E. Shrieves, and Samuel L. Tibbs, 2009. Understanding the penalties associated with corporate misconduct: An empirical examination of earnings and risk. *Journal of Financial and Quantitative Analysis* 44(1), 55-83.

Parsons, Christopher A., Johan Sulaeman, and Sheridan Titman, 2018. The geography of financial misconduct. *Journal of Finance* 73(5), 2087-2137.

Povel, Paul, Rajdeep Singh, and Andrew Winton, 2007. Booms, busts, and fraud. *Review of Financial Studies* 20 (4), 1219-1254.

Rincke, Johannes and Christian Traxler, 2011. Enforcement spillovers. *Review of Economics and Statistics* 93, 1224-1234.

Ritter, Jay R., 1984. The "hot issue" market of 1980. *Journal of Business*, 57, 215-240.

Thomsen, L, 2009. Testimony of Linda Chatman Thomsen before the United States Senate Committee on Banking, Housing and Urban Affairs Concerning Investigations and Examinations by the Securities and Exchange Commission and Issues Raised by the Bernard L. Madoff Investment Securities Matter Tuesday, January 27, 2009, available at https://www.sec.gov/news/testimony/2009/ts112709lct.htm.

U.S. Securities and Exchange Commission, 2018. Annual Report, Division of Enforcement, available at https://www.sec.gov/files/enforcement-annual-report-2018.pdf.

Wang, Tracy, and Andrew Winton, 2021. Industry informational interactions and corporate fraud. *Journal of Corporate Finance* 69, 102024.

Wilson, Jared I., 2016. CEO turnover waves: Spillovers to monitoring and managerial incentives, University of Indiana working paper.

Appendix. Variable definitions

Variable name	*Variable definition*
Initial revelation date	The earliest date among the trigger event, informal inquiry, formal investigation, Wells Notice (notification that the SEC intends to take action), initial regulatory proceeding, and related private lawsuit filing dates.
Wave dummy	A binary variable taking the value of one if the firm's initial revelation is part of one of the 27 industry-specific enforcement waves identified in Table 2.
Early wave dummy	A binary variable taking the value of one if the firm's revelation occurs in the first half of an enforcement wave
Late wave dummy	A binary variable taking the value of one if the revelation occurs in the second half of a wave.
AR	AR is the market-adjusted return of the target firm on the initial revelation date.
Prior cumulative spillover effect	Prior cumulative spillover effect on firm j is the sum of AR_{ij}, where AR_{ij} is the market-adjusted return of firm j on the revelation date of firm i.
F-Score	The probability of the financial misrepresentation from Dechow et al., 2011.
Firm characteristic variables	
Firm size	The natural log of the firm's market capitalization measured at the fiscal year end before the public revelation date.
M/B ratio	Market-to-book ratio measured at the fiscal year end before the public revelation date
Insider ownership	Insider ownership percentage measured in the last year of the violation period.
Blockholder ownership	Blockholder ownership percentage measured in the last year of the violation period.
Distress dummy	A binary variable that equals 1 if the firm experienced financial distress between the beginning of the violation period and the end of the enforcement action period.
# of employees	# of employees (in thousands)
Distance to regulator office	When both DOJ and SEC are involved in the enforcement action, the minimum distance in ln(miles) between the target firm's headquarters and the nearest U.S. District Attorney office or regional SEC office. When only the SEC is involved, the distance is based on the nearest regional SEC office.
Violation and firm response variables	
Fraud dummy	A binary variable that equals 1 if fraud charges are included as part of the enforcement action, and 0 otherwise.
Insider trading dummy	A binary variable that equals 1 if insider trading charges are included in the enforcement action.
Cooperation dummy	A binary variable that equals 1 if the firm receives credit for cooperating by regulators in the enforcement proceedings documents.
Self-reported dummy	A binary variable that equals 1 if the firm self-reported its reporting violation to regulators.
Remedial actions dummy	A binary variable that equals 1 if the firm is credited by regulators for taking remedial actions as a result of the malfeasance.

C-suite dummy	A binary variable that equals 1 if one or more C-suite executive (CEO, CFO, COO, or CIO) were named as respondents as part of the enforcement action.
Private lawsuit dummy	A binary variable that equals 1 if a private lawsuit (including civil, derivative, and class action lawsuits) was filed related to the underlying misconduct alleged in the regulatory enforcement action and 0 otherwise.
Offense level	A composite score representing the criminal offense level as proscribed under United States Sentencing Commission Guidelines Manual USSG §8C2.3 and calculated as described in USSG §2B, C, E, and J.
Number of regulatory events	The number of unique days in which regulatory proceedings events occurred that are associated with the enforcement action.
Legal penalty	Total monetary penalties assessed against all related parties in the enforcement action. These include disgorgement, pre- and post-judgement interest, civil fines, restitution, civil and criminal forfeiture, and criminal fines.

Table 1. Summary statistics

This table presents summary statistics for the key variables analyzed in the paper. Enforcement waves are identified using the complete sample of all 1,286 cases of regulatory enforcement actions for financial misrepresentation initiated by the Securities and Exchange Commission or Department of Justice from 1978-2015. Data on stock price reactions are drawn from a subsample of 942 firms for which stock return data are available on CRSP on the public revelation date. Variables are described in the Appendix.

	Mean	t-stat	SD	Min	10%	25%	Median	75%	90%	Max
Stock price reactions (market-adjusted stock returns on the initial revelation date)										
Target firms AR[0]	-14.9	-25.9	17.7	-92.2	-42.1	-22.8	-8.7	-1.5	0.5	31.7
Target firms CAR[-1,1]	-16.1	-22.5	22.2	-150	-46.6	-26.5	-8.6	-0.9	2.6	39.6
Industry peer firms AR [0]	-0.08	-10.6	5.1	-80.0	-4.1	-1.6	-0.2	1.2	3.7	483.3
Industry peer firms CAR[-1,1]	-0.09	-7.4	8.0	-134	-6.8	-2.8	-0.3	2.2	6.3	429.4
Target firm characteristics										
Firm size (ln)	5.74		2.68	0.18	2.39	3.70	5.56	7.47	9.56	11.90
M/B ratio	2.63		3.19	0.61	0.96	1.09	1.58	2.66	5.09	22.83
Insider ownership	0.32		0.28	0	0.01	0.07	0.24	0.51	0.76	1
Blockholder ownership	0.43		0.27	0	0.07	0.21	0.42	0.62	0.83	1
Distress dummy	0.46		0.50	0	0	0	0	1	1	1
No. of Employees (in thousands)	14.5		46.8	0.00	0.01	0.07	0.60	5.36	35	461
Violation characteristics										
Fraud dummy	0.75		0.43	0	0	1	1	1	1	1
Insider trading dummy	0.07		0.26	0	0	0	0	0	0	1
Cooperation dummy	0.26		0.44	0	0	0	0	1	1	1
Self-reported dummy	0.10		0.29	0	0	0	0	0	0	1
Remedial actions dummy	0.25		0.43	0	0	0	0	1	1	1
C-suite dummy	0.76		0.43	0	0	1	1	1	1	1
Class action lawsuit dummy	0.46		0.50	0	0	0	0	1	1	1
Offense level	10.94		15.86	0	0	0	0	28	36	52
No. of regulatory events	6.83		8.81	1	1	2	4	8	16	152
Legal penalty (ln)	10.81		6.51	0	0	9.21	12.76	15.47	19.40	23.13

Table 2. Enforcement waves

This table reports the results of our procedure to identify industry-specific waves in the revelation of financial misrepresentation that prompts regulatory enforcement actions. The sample includes 1,286 regulatory enforcement actions for financial misrepresentation from 1978-2015. The *Initial revelation date* is the earliest among the following events: trigger event, informal inquiry, formal investigation, Wells Notice, first regulatory proceeding, private lawsuit filing, and related financial restatement. We identify industries using the Fama-French 48 industry classifications. Wave periods consist of consecutive months in which the number of new misconduct revelations that prompt enforcement actions over the next 24 months is greater than or equal to the 95th percentile value in the simulated distribution of events. The table reports the start and end month for each wave, the wave length, the number of enforcement actions during the wave, and the 95th percentile value from the simulated distribution of events. There are a total of 27 waves in 21 different industries.

Industry	Wave begin	Wave end	Wave length (months)	# of actual events	Simulated # of events (95th Percentile)
2 Food	2000-02	2001-12	23	6	6
6 Toys (Recreation)	1995-06	1997-03	22	5	4
7 Entertainment	1996-07	1998-05	23	6	5
10 Clothes	1998-04	2000-10	31	6	5
12 Medical Equipment	2007-01	2008-08	20	8	8
13 Pharmaceuticals	2001-12	2005-12	49	16	7
14 Chemicals	2004-07	2007-04	34	8	5
17 Construction Materials	1986-08	1988-06	23	5	4
21 Machinery	2005-02	2007-08	31	14	7
23 Automobiles /Trucks	2004-09	2007-01	29	10	6
27 Precious Metals	1985-03	1987-02	24	4	4
27 Precious Metals	1995-03	1996-11	21	4	4
30 Oil	2002-03	2005-11	45	16	8
30 Oil	2006-05	2008-11	31	11	8
31 Utilities	2002-02	2004-09	32	13	5
32 Telecommunication	2000-03	2004-01	47	15	7
34 Business Services	1998-08	2005-08	85	91	21
34 Business Services	2013-10	2015-08	23	22	21
35 Computers	2005-01	2007-12	36	14	11
36 Chips	2004-08	2008-01	42	24	11
41 Wholesale	2000-03	2003-10	44	18	10
42 Retail	1992-05	1994-03	23	12	10
42 Retail	2001-03	2003-02	24	11	10
44 Banks	1989-05	1991-04	24	11	11
44 Banks	2001-10	2003-10	25	12	11
44 Banks	2008-09	2011-05	33	17	11
45 Insurance	2004-07	2006-08	26	8	7
Average			32	14	8

Table 3. Univariate comparisons of abnormal stock returns and firm and violation characteristics in and outside of waves

This table reports on firm and violation characteristics of firms that were targeted by enforcement actions for financial misrepresentation from 1978-2015 partitioned by whether the enforcement action occurs as part of a wave, and if in a wave, whether it is in the first half (*Early wave*) or second half (*Late wave*) of the wave. Enforcement waves are identified using the complete sample of all 1,286 cases of regulatory enforcement actions for financial misrepresentation initiated by the Securities and Exchange Commission or Department of Justice from 1978-2015. Data on stock price reactions are drawn from a subsample of 942 firms for which stock return data are available on CRSP. Variables are described in the Appendix.

		In a wave	Not in a wave	Difference	t-stat	p-value	Early wave	Late wave	Difference	t-stat	p-value
Initial revelation date abnormal return (%)	N	289	653				139	150			
AR[0]	Mean	-14.07	-15.30	1.23	0.98	0.33	-16.56	-11.76	-4.80	-2.27	0.02
	t-stat	-13.24	-22.28				-9.63	-9.32			
Target firm characteristics											
Firm size	Mean	6.69	5.31	1.38	7.73	<.0001	6.81	6.57	0.24	0.79	0.43
M/B ratio	Mean	2.70	2.59	0.11	0.50	0.62	3.13	2.30	0.83	2.12	0.04
Insider ownership	Mean	0.28	0.33	-0.05	-2.88	<0.01	0.29	0.28	0.02	0.55	0.58
Blockholder ownership	Mean	0.40	0.45	-0.04	-2.61	0.01	0.42	0.39	0.03	0.90	0.37
Distress dummy	Mean	0.48	0.45	0.03	0.96	0.34	0.50	0.46	0.04	0.80	0.43
No. of employees	Mean	18.11	13.00	5.11	1.79	0.07	18.32	17.90	0.42	0.08	0.93
Violation characteristics											
Fraud dummy	Mean	0.73	0.76	-0.03	-1.26	0.21	0.72	0.74	-0.02	-0.51	0.61
Insider trading dummy	Mean	0.07	0.07	0.00	0.31	0.76	0.06	0.09	-0.02	-0.83	0.40
Cooperation dummy	Mean	0.35	0.22	0.13	4.89	<.0001	0.31	0.40	-0.09	-1.83	0.07
Self-reported dummy	Mean	0.09	0.10	-0.01	-0.62	0.54	0.07	0.11	-0.04	-1.31	0.19
Remedial actions dummy	Mean	0.32	0.23	0.09	3.41	<0.01	0.29	0.35	-0.06	-1.26	0.21
C-suite dummy	Mean	0.73	0.77	-0.04	-1.49	0.14	0.70	0.76	-0.05	-1.16	0.25
Private lawsuit dummy	Mean	0.52	0.43	0.09	2.87	0.00	0.51	0.53	-0.01	-0.24	0.81
Offense level	Mean	14.16	9.55	4.61	4.82	<.0001	13.72	14.58	-0.86	-0.50	0.62
No. of regulatory events	Mean	8.48	6.12	2.36	4.42	<.0001	8.51	8.45	0.06	0.05	0.96
Legal penalty (ln)	Mean	12.37	10.15	2.22	5.67	<.0001	11.74	12.97	-1.23	-2.08	0.04

Table 4. The cross section of target firms' share price reactions

This table reports estimation results of regression in which the dependent variables are market-adjusted stock returns of target firm *i* when the targeted firm's misconduct is initially revealed to the public. The sample of targeted firms consists of all firms targeted for enforcement action for financial misrepresentation from 1978-2015 that have sufficient stock price and financial data on CRSP and Compustat. *Wave dummy* is a binary variable taking the value of one if the firm's initial revelation is part of one of the 27 industry-specific enforcement waves identified in Table 2. *Late wave dummy* is a binary variable taking the value of one if the revelation occurs in the second half of a wave. Models (2) and (4) include industry fixed effects. Industry clustered standard errors are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Dependent variable = AR[0]				Panel B: Dependent variable = CAR[-1,1]			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Intercept	-6.313***		-6.491***		-3.577		-3.842	
	(2.231)		(2.117)		(2.750)		(2.697)	
Wave dummy	0.224	0.476	-2.529	-2.507	1.840	1.781	-2.013	-2.279
	(1.930)	(1.972)	(3.042)	(3.054)	(2.276)	(2.392)	(3.710)	(3.746)
Late wave dummy			5.276**	5.751**			7.389**	7.829***
			(2.443)	(2.467)			(3.101)	(3.014)
Firm size	0.992***	0.881**	1.039***	0.926***	0.437	0.373	0.505	0.441
	(0.340)	(0.345)	(0.339)	(0.341)	(0.489)	(0.496)	(0.503)	(0.510)
M/B ratio	-0.915**	-0.891**	-0.877**	-0.849***	-1.180***	-1.228***	-1.123***	-1.168***
	(0.393)	(0.374)	(0.352)	(0.322)	(0.446)	(0.430)	(0.397)	(0.371)
Insider ownership	-2.065	-2.547	-2.007	-2.507	-2.142	-3.568	-2.085	-3.545
	(2.346)	(2.554)	(2.402)	(2.647)	(2.687)	(2.853)	(2.737)	(2.970)
Blockholder ownership	-0.531	0.708	-0.253	1.074	0.216	1.804	0.609	2.311
	(2.604)	(3.124)	(2.652)	(3.204)	(3.088)	(3.833)	(3.110)	(3.861)
Distress dummy	-2.465**	-2.434**	-2.452**	-2.418*	-5.452***	-5.389***	-5.428***	-5.364***
	(1.206)	(1.239)	(1.223)	(1.265)	(1.761)	(1.797)	(1.764)	(1.799)
No. of employees	-0.009	-0.006	-0.009	-0.007	0.005	0.010	0.004	0.009
	(0.011)	(0.012)	(0.011)	(0.013)	(0.012)	(0.013)	(0.012)	(0.013)
Fraud dummy	-3.104***	-2.918**	-3.097***	-2.895**	-2.403*	-2.011	-2.370*	-1.962
	(1.075)	(1.251)	(1.126)	(1.352)	(1.394)	(1.376)	(1.337)	(1.357)
Insider trading dummy	6.488**	5.711*	6.155**	5.359*	7.276**	6.142	6.965*	5.839
	(2.969)	(3.075)	(2.928)	(3.003)	(3.690)	(3.830)	(3.650)	(3.767)
Cooperation dummy	-1.982	-1.226	-2.158	-1.414	-0.826	-0.202	-1.096	-0.499
	(2.212)	(2.258)	(2.313)	(2.367)	(2.590)	(2.653)	(2.696)	(2.754)
Self-reported dummy	1.944	1.957	1.800	1.742	3.242	3.027	3.024	2.723
	(1.684)	(1.718)	(1.619)	(1.655)	(2.225)	(2.330)	(2.096)	(2.183)
Remedial actions	-0.139	-1.183	-0.149	-1.189	-2.008	-3.117	-2.033	-3.126
	(2.268)	(2.220)	(2.261)	(2.212)	(2.128)	(2.090)	(2.099)	(2.057)
C-suite dummy	-3.511***	-3.235***	-3.733***	-3.497***	-3.416**	-3.440**	-3.746***	-3.807***
	(1.100)	(1.110)	(1.118)	(1.136)	(1.397)	(1.362)	(1.287)	(1.263)
Private lawsuit dummy	-8.877***	-8.550***	-8.847***	-8.533***	-9.595***	-9.621***	-9.569***	-9.623***
	(1.383)	(1.472)	(1.303)	(1.383)	(1.522)	(1.628)	(1.418)	(1.512)
Offense level	0.025	0.011	0.025	0.012	0.028	0.000	0.029	0.002
	(0.051)	(0.055)	(0.051)	(0.055)	(0.065)	(0.068)	(0.065)	(0.067)
No. of regulatory events	-0.172	-0.146	-0.165	-0.136	-0.219*	-0.167	-0.210	-0.157
	(0.108)	(0.119)	(0.114)	(0.126)	(0.122)	(0.130)	(0.132)	(0.142)
Legal penalty (ln)	0.027	0.047	0.017	0.036	0.053	0.085	0.038	0.070
	(0.094)	(0.092)	(0.093)	(0.090)	(0.101)	(0.100)	(0.102)	(0.099)
N	865	865	865	865	886	886	886	886
Adjusted R-squared	0.209	0.173	0.216	0.182	0.168	0.151	0.177	0.161
Industry fixed effects	No	Yes	No	Yes	No	Yes	No	Yes

Table 5. Share pre reactions of industry peer firms (spillover effects), univariate comparisons

This table reports the mean and median market-adjusted stock returns for firms in the same industry as the firm targeted for enforcement action for financial misrepresentation, on the day that the targeted firm's misconduct is initially revealed to the public. The sample of targeted firms consists of all firms targeted for enforcement action for financial misrepresentation from 1978-2015 that have sufficient stock price and financial data on CRSP and Compustat for subsequent tests. The sample of industry peer firms, which are the subject of this table, consists of all CRSP-listed firms in the same industry. Industries are defined using the Fama-French 48 industry classifications. The z-statistics are from Wilcoxon signed-rank one-sample median test or Wilcoxon signed rank-sum two-sample median tests.

		Panel B: Wave vs. nonwave related spillover effects on industry peer firms			*Panel C:* Early wave vs. late wave spillover effects on industry peer firms		
	Panel A: All industry peer firms	Wave-related spillovers	Non-wave related spillovers	Difference	Early wave spillovers	Late wave spillovers	Difference
N	441,648	174,027	267,621		92,295	81,732	
AR[0] %							
Mean	-0.082	-0.185	-0.014	-0.171	-0.240	-0.124	-0.116
t-statistic	-10.55	-13.22	-1.61	-10.78	-11.19	-7.09	-4.12
Median	-0.167	-0.220	-0.142	-0.078	-0.273	-0.175	-0.098
z-statistic	-45.99	-35.62	-30.36	-18.28	-29.13	-20.52	-10.06
CAR[-1,1]%							
Mean	-0.090	-0.278	0.032	-0.310	-0.382	-0.157	-0.225
t-statistic	-7.43	-12.34	2.37	-12.56	-11.18	-5.51	-5.00
Median	-0.306	-0.460	-0.243	-0.217	-0.560	-0.376	-0.184
z-statistic	-42.83	-36.15	-25.18	21.88	-28.82	-21.82	-9.90

Table 6. Share price reactions of industry peer firms (spillover effects), multivariate tests

This table reports estimation results of regressions in which the dependent variables are peer firm *j*'s market-adjusted stock returns surrounding the public revelation day of firm *i's* misconduct. The sample of industry peer firms, which are the subject of this table, consists of all CRSP-listed firms in the same industry as the target and have non-missing values for all control variables. Industries are defined using the Fama-French 48 industry classifications. *Wave* dummy is a dummy variable taking the value of one if the target firm's initial revelation is part of an industry-specific enforcement wave. *Early wave* dummy is a dummy variable taking the value of one if firm *i*'s revelation date occurs in the first half of an enforcement wave. All models include industry fixed effects, and standard errors reported in parentheses below the coefficient estimates are industry clustered standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Dependent variable = Peer AR[0]				Panel B: Dependent variable = Peer CAR[-1,1]			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Wave dummy	-0.170***	-0.109***	-0.128***	-0.089***	-0.248***	-0.083*	-0.183*	-0.060
	(0.042)	(0.039)	(0.033)	(0.032)	(0.060)	(0.049)	(0.100)	(0.069)
Early wave dummy		-0.120***		-0.078*		-0.322***		-0.242***
		(0.030)		(0.040)		(0.076)		(0.093)
Target firm size			-0.013	-0.012			-0.022	-0.020
			(0.009)	(0.009)			(0.030)	(0.030)
Target M/B			0.003	0.004			-0.008	-0.004
			(0.004)	(0.004)			(0.011)	(0.011)
Peer firm size			-0.037**	-0.037**			-0.082***	-0.083***
			(0.015)	(0.015)			(0.020)	(0.021)
Peer M/B			-0.034***	-0.033***			-0.054***	-0.050***
			(0.004)	(0.004)			(0.016)	(0.017)
Insider ownership			-0.157	-0.152			-0.556*	-0.539*
			(0.105)	(0.104)			(0.333)	(0.324)
Blockholder ownership			-0.035	-0.028			0.265*	0.285*
			(0.114)	(0.116)			(0.151)	(0.151)
Distress dummy			0.025	0.026			0.039	0.040
			(0.038)	(0.038)			(0.109)	(0.107)
No. of employees			0.000	0.000			0.000	0.000
			(0.000)	(0.000)			(0.001)	(0.001)
Fraud dummy			0.028	0.029			0.037	0.039
			(0.119)	(0.119)			(0.083)	(0.087)
Insider trading dummy			-0.013	-0.011			-0.075	-0.068
			(0.045)	(0.044)			(0.134)	(0.129)
Cooperation dummy			0.037	0.036			-0.125	-0.127
			(0.130)	(0.131)			(0.231)	(0.231)
Self-reported dummy			0.008	0.003			0.064	0.047
			(0.100)	(0.100)			(0.155)	(0.155)
Remedial actions dummy			-0.057	-0.057			0.004	0.003
			(0.130)	(0.131)			(0.212)	(0.215)
C-suite dummy			-0.023	-0.031			-0.243	-0.269
			(0.079)	(0.081)			(0.186)	(0.198)
Private lawsuit dummy			-0.040	-0.035			-0.004	0.011
			(0.061)	(0.061)			(0.087)	(0.092)
Offense level			-0.002	-0.002			-0.008***	-0.007**
			(0.002)	(0.002)			(0.003)	(0.003)
No. of regulatory events			0.000	0.000			0.000	0.001
			(0.003)	(0.003)			(0.005)	(0.005)
Legal penalty (ln)			0.003	0.002			0.018**	0.016**
			(0.002)	(0.002)			(0.007)	(0.007)
N	244411	244411	244411	244411	244449	244449	244449	244449
Adjusted R-squared	0.0002	0.0003	0.0009	0.0009	0.0002	0.0003	0.0014	0.0015
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 7. Target firms' total loss in share value, including prior spillovers, in and out of enforcement waves

The dependent variable is total share impact, TAR, which sums the firm's market-adjusted share price reaction upon news of its financial misconduct with the prior spillovers from its industry peer firms' revelations of misconduct. In particular, TAR is the sum of AR and *Prior cumulative spillover effect*, where AR is the abnormal return of the target firm j in the first event in its enforcement action period, and *Prior cumulative spillover effect* for firm *j* is the sum of AR(j,i), where AR(j,i) is the abnormal return of firm j on the revelation date of firm *i*. To compute *Prior cumulative spillover effect* of firm *j*, we sum AR(j,i) over all *i*'s where the revelation date of firm *j* is within two years after the revelation date of firm *i*. *Prior cumulative spillover effect* is set to be zero if there is no revelation of violations in the two years before firm *j*'s revelation date. All independent variables measure the characteristics of firm *j*. *Late wave dummy* is a binary variable taking the value of one if the revelation occurs in the second half of a wave. Industry clustered standard errors are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable: *TAR= AR(0) + Prior cumulative spillover effect*					
	(1)	(2)	(3)	(4)	(5)	(6)
Wave dummy	0.772	-1.273	0.049	0.431	-1.916	-1.787
	(2.748)	(4.745)	(2.364)	(2.518)	(3.715)	(3.813)
Late wave dummy		3.964			3.766	4.277
		(4.325)			(2.896)	(2.948)
Firm size			0.836**	0.755*	0.869**	0.789**
			(0.390)	(0.397)	(0.390)	(0.392)
M/B ratio			-0.904*	-0.931**	-0.877**	-0.899**
			(0.472)	(0.450)	(0.436)	(0.403)
Insider ownership			0.077	-0.052	0.118	-0.022
			(2.831)	(3.161)	(2.959)	(3.302)
Blockholder ownership			-1.122	0.655	-0.923	0.927
			(3.155)	(3.766)	(3.207)	(3.859)
Distress dummy			-2.816**	-2.838**	-2.807**	-2.826**
			(1.276)	(1.310)	(1.298)	(1.339)
No. of employees			-0.002	0.004	-0.002	0.003
			(0.011)	(0.013)	(0.011)	(0.013)
Fraud dummy			-3.015**	-2.706**	-3.010**	-2.689*
			(1.182)	(1.322)	(1.214)	(1.385)
Insider trading dummy			7.423**	6.550*	7.185**	6.288*
			(3.294)	(3.498)	(3.250)	(3.435)
Cooperation dummy			-2.296	-1.637	-2.422	-1.777
			(2.429)	(2.501)	(2.490)	(2.561)
Self-reported dummy			1.909	1.953	1.807	1.793
			(1.700)	(1.759)	(1.651)	(1.716)
Remedial actions dummy			0.633	-0.361	0.626	-0.366
			(2.147)	(2.079)	(2.123)	(2.050)
C-suite dummy			-4.423***	-3.759***	-4.581***	-3.954***
			(1.132)	(1.204)	(1.206)	(1.289)
Private lawsuit dummy			-8.179***	-7.547***	-8.157***	-7.534***
			(1.244)	(1.280)	(1.198)	(1.227)
Offense level			-0.001	-0.016	0.000	-0.016
			(0.048)	(0.051)	(0.048)	(0.051)
No. of regulatory events			-0.141	-0.114	-0.136	-0.107
			(0.097)	(0.104)	(0.101)	(0.110)
Legal penalty (ln)			-0.006	0.001	-0.013	-0.007
			(0.100)	(0.101)	(0.100)	(0.101)
N	942	942	865	865	865	865
Adjusted R-squared	0.0003	0.004	0.169	0.135	0.172	0.139
Industry fixed effects	Yes	Yes	No	Yes	No	Yes

Table 8: Price path before public revelation: early wave vs. late wave

This table summarizes measures of the direct and prior spillover effects for firms targeted for enforcement action for financial misrepresentation. For each firm in our sample, we measure the cumulative abnormal return for the 252 trading days before its initial revelation (of misrepresentation) date. The cumulative abnormal return is then partitioned into the direct effect on the targeted firm and the firm's prior spillover effects. In Panel A, the direct effect is measured as AR[0] and the prior spillover effect is CAR[-252,-1]. In Panel B, the direct effect is measured as CAR[-5,0] and the prior spillover effect is CAR[-252,-6]. Returns are measured relative to firm size and book-to-market ratio benchmarks. Specifically, for each day, we sort all CRSP stocks into one of the 25 portfolios by market cap and equity book-to-market ratios. We require four months between the fiscal year end date and the portfolio formation-date. The size and book-to-market adjusted abnormal return is defined as the daily return minus the average returns of all the stocks in the same size and book-to-market ratio ranked portfolio.

Panel A: Direct effect on targeted firm measured as AR[0]

	CAR[-252,-1] (Spillover effect)	AR[0] (Direct effect)	CAR[-252,0] (Total loss)	Spillover as % of total loss
All wave targets	-17.7%	-13.9%	-31.6%	56%
Early wave targets	-15.3%	-16.6%	-31.9%	48%
Late wave targets	-20.0%	-11.4%	-31.5%	64%

Panel B: Direct effect on targeted firm measured as CAR[-5,0]

	CAR[-252,-6] (Spillover effect)	CAR[-5,0] (Direct effect)	CAR[-252,0] (Total loss)	Spillover as % of total loss
All wave targets	-15.1%	-16.6%	-31.6%	48%
Early wave targets	-12.2%	-19.7%	-31.9%	38%
Late wave targets	-17.8%	-13.7%	-31.5%	57%

Table 9. Violation clusters

This table reports the results of our procedure to identify industry-specific violation clusters among the 1,286 firms in our sample that subsequently faced enforcement action for financial misrepresentation. Violation start dates are identified from information reported in enforcement proceedings and releases. We identify industries using the Fama-French 48 industry classifications. Cluster periods consist of consecutive months in which the number of new violations over the next 24 months is greater than or equal to the 95% percentile of the simulated distribution of new violations. The table reports the start and end month for each cluster, the number of new violations begun during the cluster period, the 95% percentile value of the simulated maximum number of events during the cluster period, and the length of each cluster period. In total, there are 25 violation clusters in 22 industries from 1978 through 2015. The last column reports the number of months from the beginning of the violation cluster period and the beginning of the subsequent wave of enforcement actions, for violation clusters that are followed by enforcement waves. NA indicates that the violation cluster was not followed by an enforcement wave.

	Cluster period begin		Cluster period end		# of actual	Simulated # of events (95%	Cluster length	Number of months between violation cluster and enforcement
Industry	Year	Month	Year	Month	events	Percentile)	(months)	wave
2 Food	1996	10	1998	6	5	5	21	20
6 Toys	1993	4	1995	1	4	4	22	5
7 Entertainment	1991	7	1993	5	5	5	23	38
9 Consumer Goods	1985	9	1987	7	6	5	23	NA
10 Clothes	1997	7	1999	5	6	5	23	0
12 Medical Equipment	2000	1	2001	5	7	7	17	68
13 Pharmaceutical Products	1999	1	2001	1	9	7	25	11
21 Machinery	1996	7	2001	2	8	6	56	48
22 Electrical Equipment	1995	1	1996	4	5	5	16	NA
22 Electrical Equipment	2001	1	2002	7	5	5	19	NA
23 Automobiles and Trucks	1998	1	2001	10	9	5	46	35
30 Oil	2000	7	2004	4	12	8	46	0
31 Utilities	1997	6	2002	1	7	5	56	1
32 Telecommunication	1997	7	2000	7	10	7	37	0
34 Business Services	1996	5	2002	1	44	20	69	0
35 Computers	1996	3	1998	1	10	10	23	NA
35 Computers	1999	1	2001	6	14	10	30	43
36 Chips	1995	10	2001	1	15	10	64	43
37 Electronic Equipment	2003	4	2005	1	4	4	22	NA
40 Shipping Containers	1999	1	2001	9	5	5	33	NA
41 Wholesale	1996	9	2001	10	13	10	62	0
42 Retail	1999	1	2002	1	11	10	37	0
44 Banks	1989	5	1990	12	13	11	24	0
44 Banks	2007	1	2010	7	16	11	43	0
47 Real Estate	2000	1	2002	1	9	9	25	NA
						Mean	34.5	17.3

Table 10. F-Score clusters

This table summarizes the industries and years that are classified as having F-score clusters, among all Compustat listed firms from 1978 through 2015. Industries are based on the Fama-French 48 industry classifications. For each industry-year, we count the number of firms with F-scores larger than 2.5, which Dechow et al. (2011) use to classify a firm as one that is misstating earnings. An industry-year is part of an F-score cluster if the number of firms with F-scores > 2.5 is greater or equal to the 95% percentile value of the simulated distribution of firms with high F-scores. This procedure identifies a total of 27 industries with at least one F-score cluster year.

Industry	F-Score cluster years	Maximum (across years listed) of firms with F-Score > 2.5	Simulated # of firms (95% Percentile)
3 Candy & Soda	1999	4	4
6 Toys (Recreation)	1994-1996	13	11
8 Printing and Publishing	2006	9	8
9 Consumer Goods	1987, 1994	16	15
10 Clothes	1994, 1998	18	15
11 Healthcare	1992, 1995-1998	24	17
12 Medical Equipment	1997, 1998, 2004	26	24
13 Pharmaceuticals	1998, 2004, 2006, 2013-2015	42	36
14 Chemicals	2005-2006	12	10
18 Construction	1988, 1994, 1997-2000, 2004-2005	26	16
19 Steel Works	2007	8	8
21 Machinery	1996-1997	24	22
24 Aircraft	2004	6	6
28 Mining	2007, 2010, 2011, 2014, 2015	22	16
30 Oil	2005	26	23
32 Telecommunication	1996, 1998-2000	35	20
34 Business Services	1996-2001, 2004, 2005	207	75
35 Computers	1996-2000	62	35
36 Chips	1997, 2000	71	33
37 Control Equipment	1979, 1996, 2000	17	15
40 Transportation	1997	13	11
41 Wholesale	1987-1988, 1993-1999	79	37
42 Retail	1997, 1998	33	23
43 Restaurants, Hotels, Motels	1997	9	9
44 Banks	1996, 1998, 2004-2015	253	80
47 Finance	1988, 1996-1999, 2004-2006, 2011, 2013, 2014	102	47.5
48 Other	1991, 1994, 1995, 1997	25	20

Table 11. The relation between enforcement action waves and prior violation clusters

This table presents the relation between clusters of financial reporting violations and enforcement action waves. Panel A reports results in which firms' violations are identified by the beginning of their violation period, as identified in regulatory proceedings. This procedure limits the prior violations to firms in our sample. Panel B reports results in which the estimated pervasiveness of financial misrepresentation is measured using Dechow et al.'s (2011) F-score for each industry-year. This procedure uses data from all Compustat-listed firms. The Chi-squared test statistic tests the null hypothesis that enforcement waves and violation (or F-score) clusters are unrelated, against the alternative that they are related.

Panel A: *Violation clusters*

			Part of a prior violation cluster?		
			No	Yes	Total
Part of an enforcement wave?	No	#	760	139	899
		Row %	85%	15%	
	Yes	#	155	232	387
		Row %	40%	60%	
		Total	915	371	1286
		Row %	71%	29%	
		Chi-squared	260.84		
		p-value	<0.0001		

Panel B: *F-Score clusters*

			Part of a prior F-Score cluster?		
			No	Yes	Total
Part of an enforcement wave?	No	#	786	115	899
		Row %	87%	13%	
	Yes	#	267	122	387
		Row %	69%	31%	
		Total	1051	235	1286
		Row %	82%	18%	
		Chi-squared	60.11		
		p-value	<0.0001		

Table 12. The effect of SEC budget growth on new enforcement actions and waves

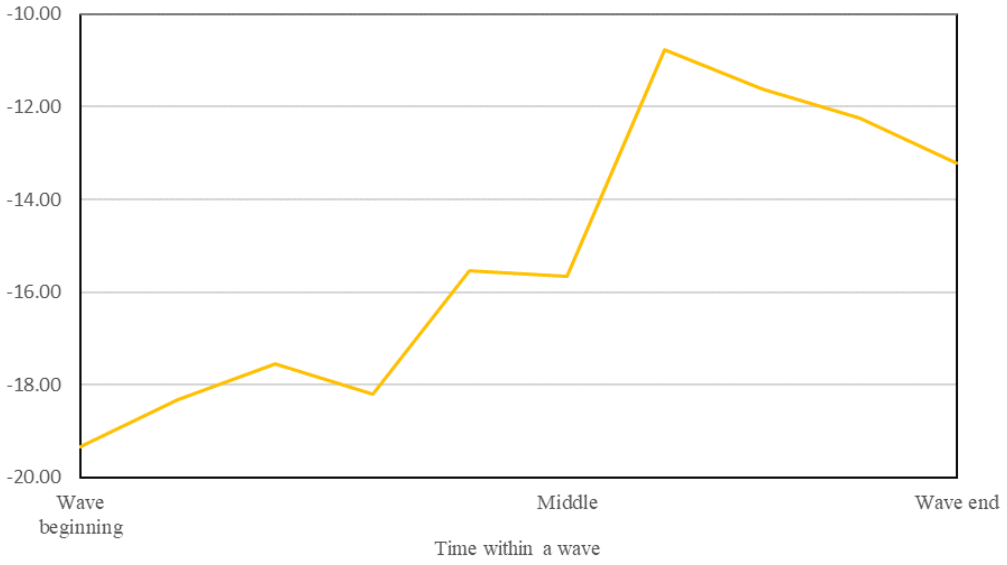
This table reports the results for linear probability regressions of enforcement actions and wave periods on SEC budget. The sample includes all Compustat firms. In Panel A, the dependent variable is *New action*$_{it}$, a dummy variable that takes the value of one if an enforcement action for misconduct was initiated at firm *i* in year *t*, and zero otherwise. In Panel B, the dependent variable is *New action*$_{it}$, which takes the value of one if an enforcement action was initiated for misconduct at firm *i* in year *t* and the action is part of a wave, and zero otherwise. Firm characteristics variables include *Firm size*, *M/B ratio*, and Dechow et al.'s (2011) F-Score, which measures the likelihood that the firm's financial statements are misstated. *Distance to regulator office* is the logarithm of the number of miles to the closest District Attorney or regional SEC office. *SOX dummy* is equals one if the enforcement action occurred after the passage of the Sarbanes-Oxley Act in 2002. In both panels, columns (1), (3), and (5) include industry fixed effects and columns (2), (4), and (6) include firm fixed effects. Robust standard errors are reported below the coefficients. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Dependent variable = New action

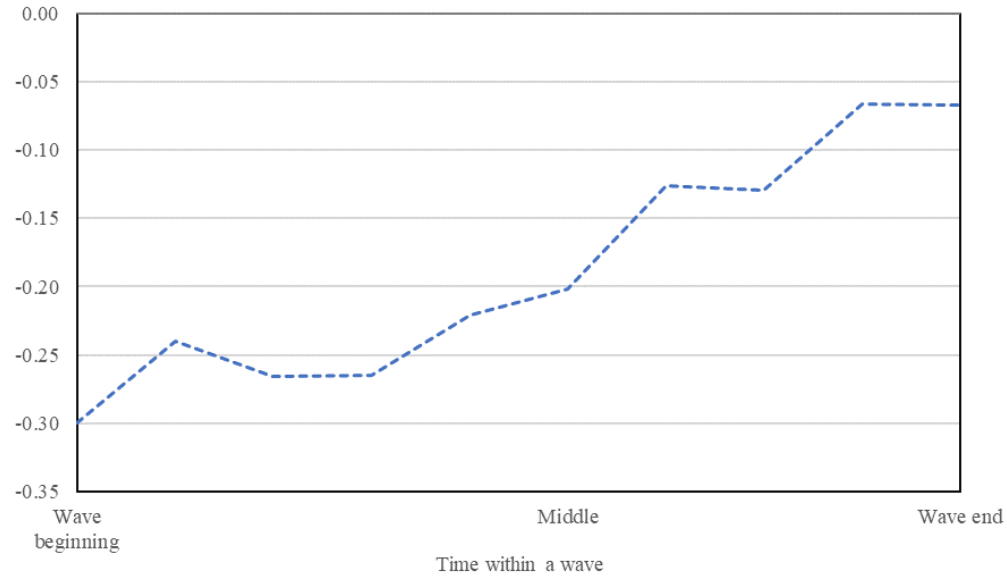
	(1)	(2)	(3)	(4)	(5)	(6)
SEC budget growth in year [0]	0.551***	0.387*	0.518**	0.371*	0.583**	0.427
	(0.209)	(0.216)	(0.209)	(0.216)	(0.294)	(0.300)
SEC budget growth in year [-1]	0.615***	0.624***	0.609***	0.595**	0.601**	0.527**
	(0.234)	(0.238)	(0.232)	(0.237)	(0.235)	(0.239)
SEC budget growth in year [-2]	0.293	0.456*	0.452**	0.624***	0.416*	0.483**
	(0.225)	(0.233)	(0.229)	(0.237)	(0.231)	(0.240)
Firm size	0.057***	0.063***	0.055***	0.057***	0.052***	0.031*
	(0.007)	(0.016)	(0.007)	(0.016)	(0.007)	(0.017)
M/B ratio	0.008	-0.009	0.007	-0.009	0.006	-0.002
	(0.067)	(0.079)	(0.067)	(0.079)	(0.067)	(0.079)
F-Score	0.021*	-0.038***	0.020*	-0.038***	0.020*	-0.035***
	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)	(0.013)
Distance to regulator office			-0.005	0.046	-0.006	0.050
			(0.006)	(0.158)	(0.006)	(0.158)
SOX dummy					0.000	0.002***
					(0.000)	(0.001)
SEC budget growth * SOX dummy					-0.108	-0.213
					(0.384)	(0.398)
Intercept	-0.001**	-0.001	-0.001**	-0.002	-0.001*	-0.001
	(0.000)	(0.001)	(0.000)	(0.005)	(0.001)	(0.005)
N	193735	194669	193488	194422	193488	194422
Adjusted R-squared	0.001	0.016	0.001	0.017	0.001	0.017
Industry Fixed Effects	Yes	No	Yes	No	Yes	No
Firm Fixed Effects	No	Yes	No	Yes	No	Yes

Panel B: Dependent variable = New wave action

	(1)	(2)	(3)	(4)	(5)	(6)
SEC budget growth in year [0]	0.402***	0.342**	0.405***	0.344**	0.049	0.135
	(0.143)	(0.147)	(0.143)	(0.147)	(0.127)	(0.136)
SEC budget growth in year [-1]	0.408***	0.427***	0.409***	0.424***	0.360**	0.377**
	(0.153)	(0.161)	(0.154)	(0.161)	(0.155)	(0.162)
SEC budget growth in year [-2]	0.422**	0.523***	0.432***	0.533***	0.430***	0.498***
	(0.164)	(0.170)	(0.164)	(0.169)	(0.163)	(0.169)
Firm size	0.032***	0.019**	0.032***	0.019*	0.030***	0.009
	(0.004)	(0.010)	(0.004)	(0.010)	(0.004)	(0.010)
M/B ratio	-0.024**	-0.031**	-0.025**	-0.032**	-0.025**	-0.030**
	(0.010)	(0.015)	(0.010)	(0.015)	(0.010)	(0.014)
F-Score	-0.001	-0.017***	-0.000	-0.017***	-0.001	-0.016***
	(0.005)	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)
Distance to regulator office			0.003	0.187**	0.002	0.189**
			(0.004)	(0.075)	(0.004)	(0.075)
SOX dummy					-0.000	0.000
					(0.000)	(0.000)
SEC budget growth * SOX dummy					0.497**	0.249
					(0.221)	(0.233)
Intercept	-0.002***	-0.001*	-0.002***	-0.007***	-0.001***	-0.006***
	(0.000)	(0.001)	(0.000)	(0.002)	(0.000)	(0.002)
N	193735	194669	193488	194422	193488	194422
Adjusted R-squared	0.001	-0.003	0.001	-0.003	0.001	-0.003
Industry Fixed Effects	Yes	No	Yes	No	Yes	No
Firm Fixed Effects	No	Yes	No	Yes	No	Yes



Panel A. Target firm return



Panel B. Peer firm return

Figure 1. Direct target and spillover effects on share values during waves

Figure 1 summarizes the average direct effects on the share values of firms targeted for enforcement action during an enforcement wave and the average spillover effects on the share values of all industry peer firms that have not (yet) been targeted. For this diagram we partition each wave into 10 equal time intervals, or time deciles. Panel A plots the average one-day market-adjusted stock return upon the revelation of misconduct for all firms targeted for enforcement action for each time decile. Panel B plots the average one-day market-adjusted stock return for all industry peer firms on the day that the target firm's misrepresentation is revealed.

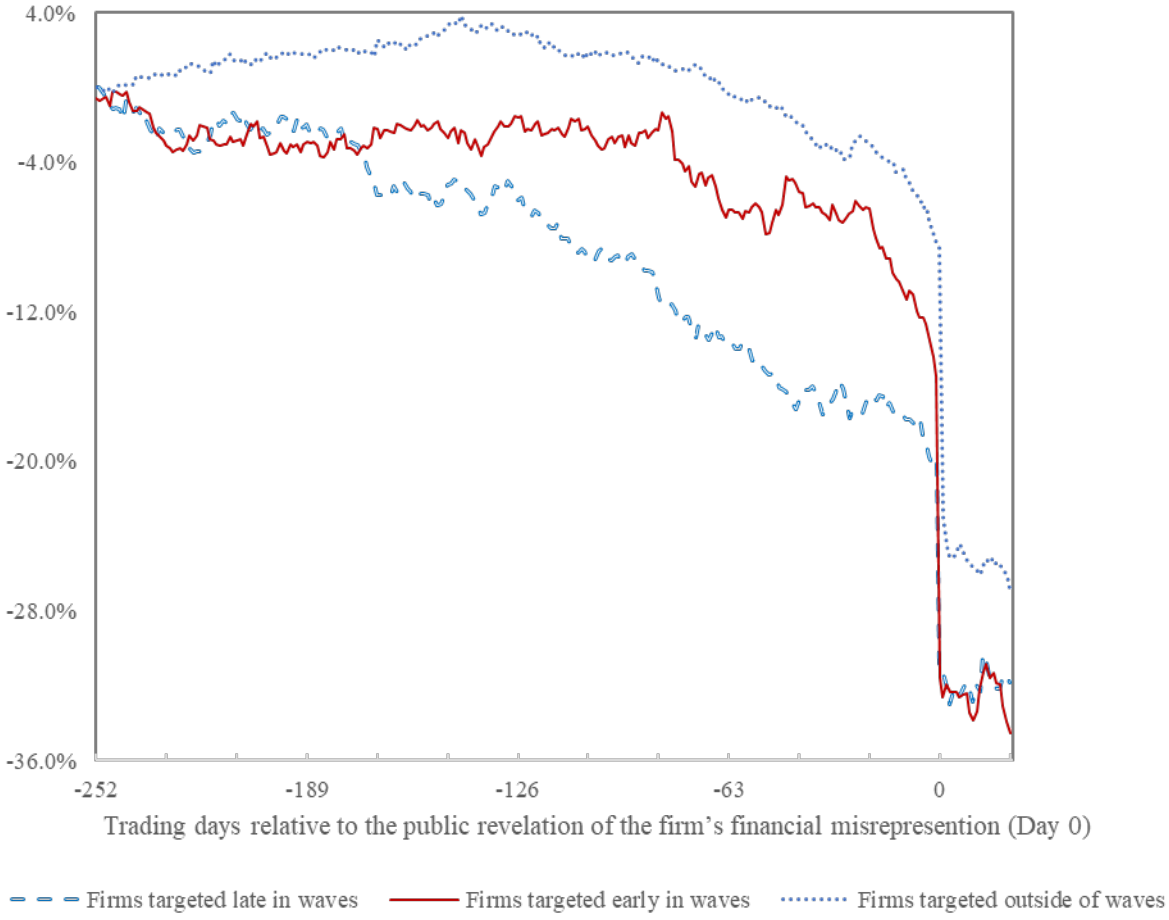


Figure 2: Target firms returns before the public revelation date of misrepresentation

The figure plots the cumulative returns of target firms over days -252 to +30 relative to the date that the firm's misrepresentation is publicly revealed. The x-axis is *k*, the number of trading days relative to the public revelation of the firm's financial misrepresentation. Abnormal returns are calculated as the average size- and book-to-market-adjusted returns across all the target firms for each date *k*, and CAR[-252,*k*] is the sum of the average size and book-to-market adjusted returns from -252 through *k*. Target firms are grouped into three groups: those caught in the early wave period, late in the wave period, or outside of any wave period.

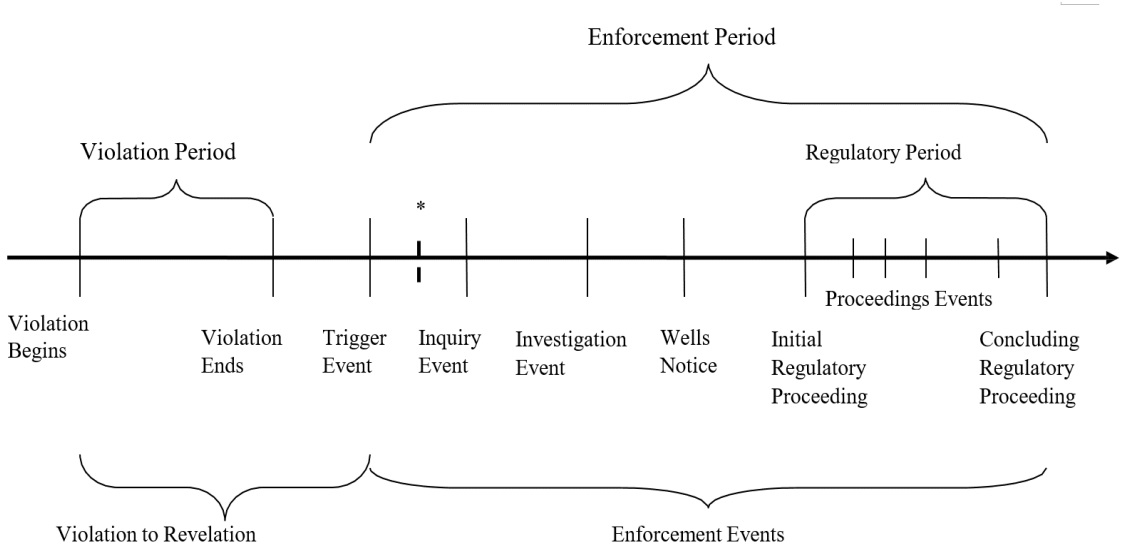


Figure 3. Timeline of an enforcement action

This figure illustrates the sequence of events in a typical enforcement action for financial misrepresentation. Not all enforcement actions include all these events.

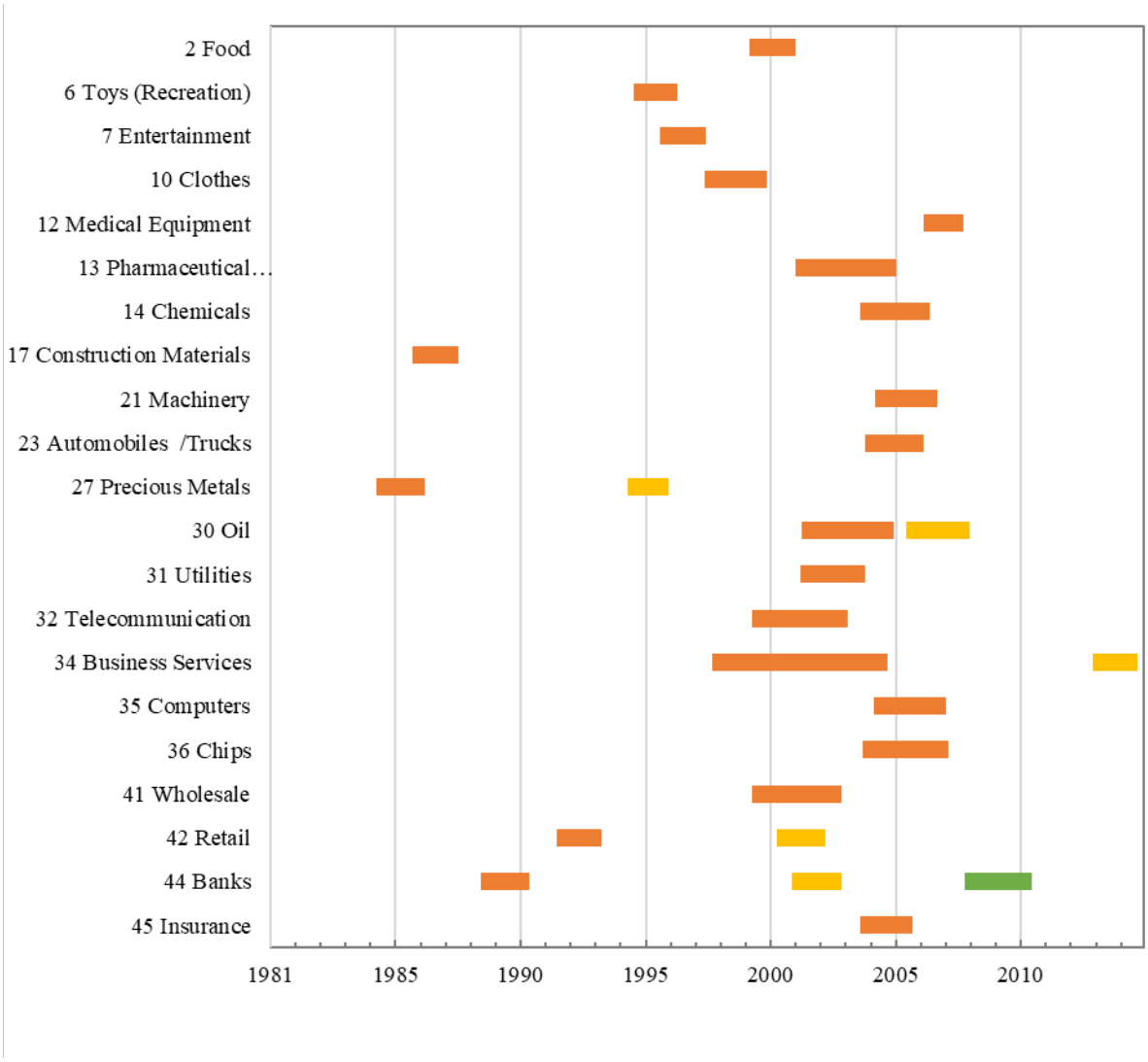
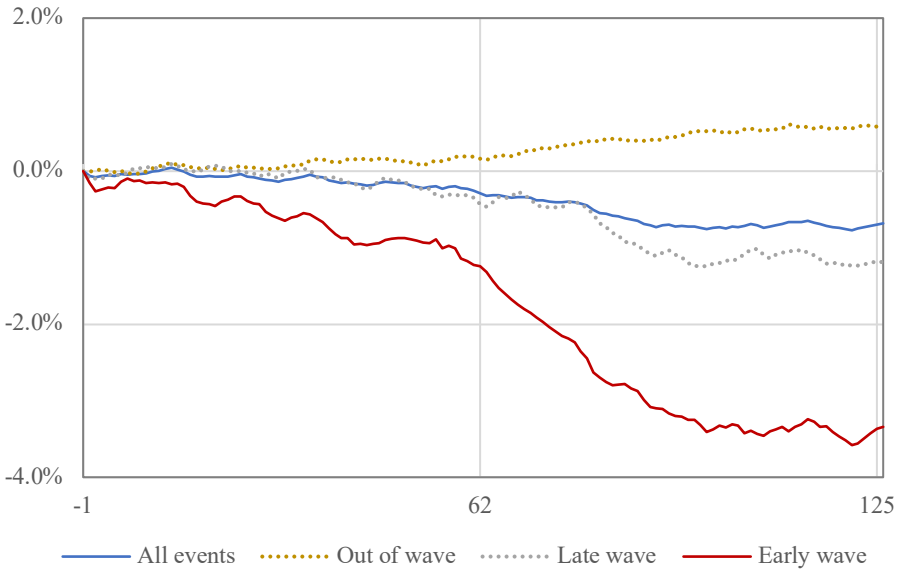
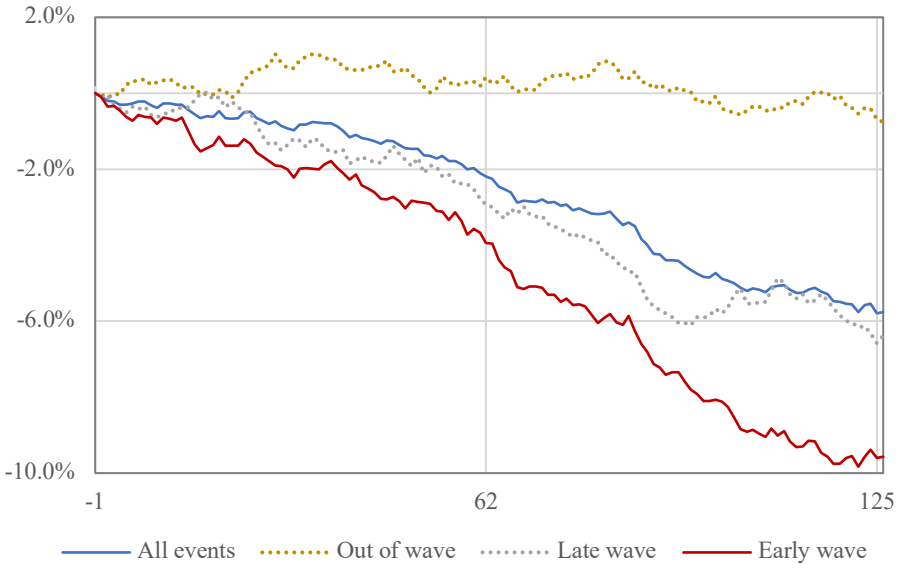


Figure 4. Illustration of enforcement waves by industry

Figure 4 displays the timing and length of industry-specific enforcement waves by the U.S. Securities and Exchange Commission and U.S. Department of Justice for financial misrepresentation. There are a total of 27 enforcement waves in 21 industries. The procedure for identifying waves is described in Section 3.



Panel A: Never-caught peers



Panel B: Subsequently caught peers

Figure 5. Spillover effects for peer firms that subsequently are, or are not, caught

This figure reports the average cumulative abnormal returns for uncaught and subsequently caught firms over the 126 trading days after one of their industry peer firms is revealed to have engaged in misconduct that prompts an enforcement action. The horizontal axis is the number of trading days relative to the revelation date of an enforcement action in an industry. Abnormal returns are adjusted for size and book-to-market ratios.

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