Evidence on Contagion in Corporate Misconduct

Simi Kedia
Associate Professor, Finance and Economics
Rutgers Business School
Rutgers Business School - Newark and New Brunswick
1 Washington Park
Newark, NJ 07102

Kevin Koh
Assistant Professor, Division of Accounting
Nanyang Business School, NTU
S3-B2C-96, Nanyang Avenue,
Singapore 639798

Shiva Rajgopal*
Julius A. Roller Professor of Accounting
Foster School of Business
University of Washington
Box 353200, Seattle, WA 98195
Tel. 206 543 7913; Fax 206 685 9392
email: rajgopal@u.washington.edu

August 23, 2009
Preliminary and incomplete
Please do not cite without permission

Abstract:

In this paper we examine the importance of contagion in the diffusion of corporate misconduct, proxied by earnings restatements. We use data on 632 restatements drawn from the GAO report covering the years 1997-2002. After controlling for many firm-level characteristics, we find that managers of "imitating" firms are more likely to begin manipulating earnings after a public announcement of a restatement by another firm located in their industry or in their city ("the innovator"). Further analysis suggests such contagion is absent if the innovator's announcement is followed by an SEC enforcement action or a class action lawsuit. However, non-negative media coverage of the innovator's announcement and larger innovators are associated with a higher likelihood of contagion in earnings manipulation.

*Corresponding author. We acknowledge financial support from our respective schools, Nanyang Business School, Rutgers University, and the Foster School of Business.

Evidence on Contagion in Corporate Misconduct

1. Introduction

The last few years have witnessed a remarkable increase in news about corporate misconduct including fraudulent financial reporting at companies such as Enron, WorldCom, and Tyco, the collapse of Arthur Andersen on allegations of lax or corrupt audit work, tax shelters structured by KPMG to assist clients in minimizing tax obligations, alleged misreporting of securitized loans by mortgage banks such as Countrywide Financial and the revelation of the $50 billion Ponzi scheme run by Bernie Madoff. Given such frequent exposure to corporate misconduct, an important question relates to the effect of such encounters on otherwise honest managers. That is, do managers start engaging in unethical behavior when they are exposed to news about corporate misconduct among their peer firms? Further, which regulatory and economic forces can mitigate or encourage potential contagion in corporate misconduct?

In this paper, we examine whether firms begin to manipulate earnings after they observe other firms disclose that they cooked their books. Understanding whether and how exposure to unethical behavior increases or decreases an individual manager's proclivity to cheat can be crucial to designing enforcement mechanisms that deter future corporate misconduct. Hence, we also examine factors that mitigate or facilitate the diffusion of earnings manipulation among firms.

The practice of cheating after observing others cheat can arise within a rational model of crime. Becker (1968) suggests that managers cheat if the benefit from such cheating exceeds their subjective assessment of costs associated with cheating. Observing another manager benefit from dishonest behavior will increase the propensity of otherwise honest managers to also act dishonestly. Exposure to corporate misconduct can also lead to contagion through social

norms especially when dishonest behavior is condoned by the peer group the manager belongs to (see Cialdini and Trost 1998).

In contrast, Gino, Ayal and Ariely (2009) suggest that exposure to a dishonest act increases its saliency and makes managers pay attention to their own standards of honesty, which in turn, decreases their tendency to act dishonestly. Moreover, the regulatory response to misconduct can significantly change the perceived costs of dishonest activities. A swift and a forceful reaction from the SEC against miscreants may lead otherwise honest managers to increase their estimate of the costs associated with dishonest activities. Hence, public enforcement, as captured by SEC actions, or private enforcement mechanisms such as class action litigation and disapproving media coverage could potentially influence the prevalence or absence of contagion in earnings manipulation.

We employ a sample compiled by the General Accounting Office (GAO) of 919 announcements of accounting restatements by 845 firms over January 1997 to June 2002. Of the total of 919 restatement observations in the GAO report, we were able to identify a beginning date of the manipulation period for 632 restatement observations. About 139 firms in the sample start manipulating their books before 1/1/97, the first day of restatement announcements covered by the GAO report. Therefore, we investigate why the remaining 493 firms over the period 1997 to 2002 began earnings manipulation. In particular, we examine the decision of these 493 firms to begin earnings manipulation (labeled "imitators") in response to the exposure or revelation of manipulation, i.e., announcement of the restatement, by other firms (labeled "innovators").

We find significant evidence that imitators' decision to begin earnings manipulation is positively associated with the number of firms that have already announced that they manipulated earnings. More specifically, we identify two channels through which contagion

occurs. Contagion of corporate misconduct is stronger if the firm announcing the restatement or the innovator firm (i) is in the same industry, or (ii) is located in the same Metropolitan Statistical Area (MSA) as the imitator. In other words, a firm has a significantly higher probability of beginning earnings manipulation if a higher fraction of its industry or its MSA has already revealed they misreported. Because firms in the same industry or in the same MSA are peer firms, albeit along different dimensions, our findings suggest that the diffusion of earnings manipulation can be widespread among peer firms.

The impact of industry and other local firms on the decision to begin misreporting is not only statistically significant but also economically important. If the proportion of the industry (MSA) that has already announced a restatement increases from the first quartile to the third quartile, the probability of an imitator beginning misreporting increases by 13% (7.5%). This contagion is robust to the inclusion of firm level controls as well as inclusion of year effects.

Next we examine actions taken by regulators and other gatekeepers to mitigate industry and MSA level contagion. An effective response from the SEC, the primary regulator overseeing corporate disclosure, could increase the potential imitator's perceived probability of getting caught and/or the costs associated with an SEC investigation. We find that this is indeed the case. In particular, when restatement announcements are associated with SEC investigations, there is no contagion in misreporting both within industries and within MSAs. Contagion in misreporting is observed only when the restatement announcement is unaccompanied by a regulatory response. This finding contradicts recent allegations in the press that the SEC has been ineffective at containing corporate wrongdoing.

Private enforcement mechanisms can also discourage earnings manipulation. In particular, we examine whether costs imposed by class action lawsuits prevent other firms from

manipulating earnings. As with the SEC's response, we find no evidence of contagion at the industry level and at the MSA level if the restatement is accompanied by a class action lawsuit. In these cases, potential imitators perceive the costs of cheating to be too high and likely refrain from earnings manipulation. This evidence is consistent with assertions by Coffee (2006) that a class action lawsuit against a miscreant can dissuade others from pursuing corporate misconduct.

We also examine the response of the media to the announcement of the restatement. Dyck, Volchkova and Zingales' (2008) findings suggest that unfavorable coverage by the media is likely to increase the perceived costs of misreporting. In contrast, a mild media response or media inattention to the restatement is likely to encourage other firms to misreport. Consistent with this conjecture, we find that contagion in misreporting, both within industries as well as within MSAs, is only observed when the media response to the innovator's restatement is not negative. When restatement announcements are accompanied by zero or negative media attention, there is no imitation of earnings manipulation.

Besides the response of the public and private enforcement mechanisms, we investigate firm characteristics that make some firms more effective at spreading earnings management practices. The results show that restatements by large firms are more likely to lead other firms in the industry or in the MSA to imitate and begin misreporting. An important policy implication of this finding is that the SEC can maximize its bang for its enforcement buck by targeting firms most likely to be associated with contagion in earnings manipulation, such as large and visible firms.

We do not believe that our results are due to an omitted industry factor or an omitted MSA factor because we are able to identify hypothesized sources of contagion that vary within the imitator's industry membership and/or location. Another potential explanation of our results

is that contagion is primarily restricted to milder or technical restatements, whereas the serious restatements are not likely to be imitated. The data suggests otherwise. Contagion is in fact most common when the innovator's restatement involved a decrease to net income as opposed to an increase or no change in net income. For robustness, we also examine contagion (both imitation and announcements) only for a sample of income decreasing restatements. As discussed later in the paper, our definition of income decreasing restatements restricts this sub-sample to severe restatements. Despite the lower statistical power associated with this restricted sample, we continue to find significant evidence of contagion at the MSA level although industry level contagion, while statistically significant by itself, is not incrementally significant to MSA level contagion.

We make several contributions to the literature. First, Hirshleifer and Teoh (2009) point out that the extant literature in financial economics seems to rely almost exclusively on market price as the mechanism via which market participants learn from each other. In reality, individuals learn from each other via conversations, observation of others' actions or the consequences of such actions although such a channel of personal learning and the resultant behavior and thought contagion is under-emphasized in the study of capital markets.[1] We are among the first to document contagion in corporate malpractices. Bizjak, Lemmon and Whitby (2009) show that option backdating spreads through board interlocks. Our paper finds that exposure to dishonest activities changes how managers perceive these activities and increases the probability that they will manipulate earnings. On a related note, most extant work on financial misreporting (e.g., Burns and Kedia 2006; Bergstresser and Philippon 2006; Cheng and Warfield 2005; Karpoff, Lee and Martin 2008 a and b) implicitly assumes that a manager narrowly

[1] Several studies in other areas suggest that peer effects matter for outcomes such as crime in neighborhoods (Glaeser, Sacerdote and Scheinkman 1996; Ludwig and Kling 2007), student test scores (Hoxby 2000), computer adoption (Goolsbee and Klenow 2002) and college drinking (Sacerdote 2001; Duncan et al., 2005).

considers his selfish expected benefits such as prolonged job tenure or compensation before deciding to cheat. We provide evidence that cheating by his peer managers significantly affects an individual manager's proclivity to cheat.

Second, the existence of contagion in corporate misconduct could have important policy implications for enforcement and policing mechanisms that encourage deterrence. For example, evidence on contagion in corporate crime might imply large differences across industries and geographical areas in the marginal productivity of enforcement spending by the SEC. We are also among the first to document that SEC AAERs and class action lawsuits mitigate contagion in manipulating earnings whereas non-negative media coverage of accounting fraud seems to encourage such contagion.

The remainder of the paper is organized as follows. Section 2 discusses the background and hypotheses. In Section 3 we describe the data set, our empirical specification and our findings. In Section 4, we conclude.

2. Background and Hypotheses

There are three potential reasons why exposure to criminal behavior among peer managers may change an otherwise honest manager's propensity to engage in misconduct: (i) a rational crime based explanation; (ii) a social-norms based explanation; and (iii) a psychological explanation related to saliency.

Becker (1968) pioneered the rational theory of crime wherein a potential criminal engages in a cost-benefit calculation that leads to his ultimate decision about dishonesty. Sah (1991) points out that though the expected benefit from a crime may be clear, the costs associated with criminal activity are often subjective and are likely based on the experiences of the individual manager. Exposure to the dishonesty of others could lead some managers to

change their subjective estimate of the likelihood of being caught or the expected costs associated with discovery. If restating firms are perceived by other honest firms to have gained unfair advantage from their reporting practices, then these honest firms are likely to increase their proclivity for aggressive accounting after their exposure to accounting fraud.

A sociological explanation for contagion relies on the idea that observing others cheat changes an individual's understanding of the social norms related to dishonesty (Cialdini and Trost 1998). Early evidence on imitation of behavior and social learning was provided by Bandura (1965) and Bandura, Ross, and Ross (1961, 1963). In these studies, children exposed to an aggressive model were considerably more aggressive toward a Bobo doll relative to children who were not exposed to the aggressive model. Moreover, children demonstrated more aggressive behavior when an adult did not comment on the aggressive model's actions (or when an adult was not present in the room) than when the adult disapproved of those actions using negative comments (Hicks 1968; Siegel and Kohn 1959). The social norms explanation suggests that when individuals identify strongly with a social group (such as peer firms), the behaviors of others in that social group will have a larger influence on observers' social norms. Hence, managers might interpret news about misreporting by their peer managers ("models" in Bandura's studies) as evidence that social norms in their labor markets condone aggressive accounting practices.

In contrast, a psychology based explanation proposed by Gino, Ayal and Ariely (2009) argues against contagion in corporate wrongdoing. They suggest that observing others' dishonest behavior may change one's own dishonesty by enhancing the saliency of ethicality at the moment one is considering a particular behavior. Becker and Murphy (2000, p. 4) argue that behaviors "most subject to strong social pressures from peers and others are those that take place

publicly." The saliency hypothesis states that when people observe someone behaving dishonestly, the saliency of this act increases, making them pay attention to their own standards of honesty, and, as a consequence, decreasing their tendency to engage in dishonest acts. This line of reasoning argues against contagion in that managers who are likely to cheat might actually stop cooking their books when news about another firm's misreporting and/or the SEC action against such a firm is made public.

These three explanations point towards channels that might mitigate the contagion in corporate crime. If the revelation of accounting problems is associated with significant costs to the misreporting firm then honest managers may rationally revise upward their estimate of the expected costs of committing violations and thereby reduce their propensity to misreport. In particular, a swift and strong reaction from public regulators and private enforcement mechanisms such as class action lawyers may deter adoption of misreporting. The social norms explanation also suggests that effective intervention by a regulator such as the SEC or private class action litigation (the "adult" in Bandura's studies) can stop contagion in corporate misconduct by clearly asserting that misreporting is not an acceptable social norm.

We study the role of both a public regulatory body (the SEC), as well as two private enforcement mechanisms -- class action lawsuits filed by shareholders of the restating firms and the portrayal of the restatement by the media -- in mitigating the potential contagion of corporate misconduct.

2.1 The SEC's role

The SEC is the primary regulator overseeing financial disclosure by public firms. Hence, its response or lack thereof to the revelation of accounting problems should effect how honest firms revise their subjective estimates of the costs of misreporting. If involvement by the SEC

substantially increases the otherwise honest manager's perceived cost of misreporting and therefore reduces the propensity to misreport, then SEC involvement should be associated with significant negative contagion, also referred to as deterrence. To study this issue, we examine the propensity of honest firms to begin misreporting after revelation of fraud in cases where the SEC was involved relative to restatement announcements that were not pursued by the SEC. We expect that SEC involvement should reduce future misreporting and lack of its involvement should increase future cheating.

Clearly, the SEC does not have the resources to pursue every corporate miscreant and its enforcement policy is presumably designed to achieve maximum deterrence of future wrongdoing. The enforcement manual of the SEC (2008, 4) specifies that the agency chooses targets for investigation based on (i) programmatic importance of an enforcement action[2]; (ii) the magnitude of the potential violations in the investigation; and (iii) the resources required for the investigation. The issue of whether the observed enforcement strategy followed by the SEC is optimal and is in line with its stated objectives is an interesting question by itself. Though we cannot directly study whether the enforcement strategy followed by the SEC achieved the maximum deterrence possible, we can and do shed some light on whether enforcement is associated with significant deterrence.

2.2 Class action litigation

Coffee (2006) reports that private class action litigation in the aggregate imposes financial penalties that overshadow those imposed by federal and state authorities and by self-

[2]The sub-criteria listed under the goal of programmatic importance of an enforcement action specifically lists three guidelines aimed at deterrence: (i) actions that address a problematic industry practice; (ii) actions that provide an opportunity for the SEC to address violative conduct targeted to a specific population or community that might not otherwise be familiar with the SEC or the protections afforded by the securities laws; and (iii) an action would alert the investing public of a new type of securities fraud.

regulatory organizations. Moreover, the total amount of damages awarded in securities class actions has soared in recent years. Consequently, restatement announcements accompanied by class action lawsuits can lead honest firms to revise upwards the costs of misreporting and potentially deter them from pursuing corporate misconduct. However, Coffee (2006) points out that private class actions may not be the best way to achieve deterrence as such actions are akin to deterring burglary by imposing penalties on the victim for having suffered a burglary. If private class action lawsuits are indeed effective at deterrence, honest firms are less likely to begin misreporting after revelation of fraud accompanied by class action lawsuits relative to fraud that is not accompanied by class action lawsuits.

2.3 Media

Next, we examine the role of the media in mitigating contagion of corporate misconduct. The governance role of the media has been proposed by Dyck, Volchkova and Zingales (2008) who report that Anglo-American press coverage increases the probability with which corporate governance abuse is reversed in Russian firms. Negative coverage by the media has also been shown by Farrell and Whidbee (2002) to increase the likelihood of CEO turnover. These arguments suggest that extensive negative coverage by the media can be costly and likely deter adoption of corporate misconduct by honest firms.

However, the effect of media on misconduct is potentially more complex. The availability heuristic, proposed by Tversky and Kahneman (1973) posits that people judge how common something is by how easy it is to retrieve or imagine examples of it. Among other things, this causes vivid case examples to be persuasive of the truth of a proposition. In other words, the extensive coverage of the wrongdoings of Enron may have led many (including politicians) to believe that misconduct is pervasive and the "norm" in corporate America.

Secondly, the exposure effect proposed by Moreland and Beach (1992) relates to the tendency for people to like things more that they have been exposed to.

In other words, though extensive media coverage or even the benign tone of media coverage could potentially increase contagion through both via the availability heuristic and the exposure effect, negative media coverage is likely to mitigate contagion. To control for this confound, we hand collect data on the tone adopted by news stories of the restatement announcement to separate the effect of greater media coverage from the negativity of the tone of such coverage (this is described in detail later). We expect (i) negative media coverage to decrease the likelihood of honest firms' adoption of misreporting; (ii) non-negative media coverage to increase the likelihood of adoption of misreporting; and (iii) absence of media coverage to have no impact on the likelihood of adoption of misreporting.

2.4 Firm characteristics and the nature of the restatement

Aside from the response of the SEC, class action lawsuits and the media, the characteristics of the firm that reveals the wrongdoing, as well as the nature of the wrongdoing, can potentially impact the adoption of earnings manipulation by honest firms. In particular, the more visible and more established the dishonest firm, the greater the likelihood that other firms will manipulate earnings. We therefore study whether revelation of wrongdoing by larger firms is associated with a higher likelihood of honest firms beginning to cheat relative to revelations by smaller firms.

Lastly, we hypothesize that misreporting practices that resonate with the motivations of the honest firms are more likely to be imitated. For instance, revelation of misreporting in accounting for mergers is not likely to be of interest to firms that are not planning to undertake acquisitions. In contrast, honest firms are likely to take notice of all misreporting practices that

facilitate an increase in the reported income. We study if income decreasing restatements are associated with a higher likelihood of honest firms will manipulate earnings.[3]

3.0 Empirical Findings

3.1 Sample

Our sample consists of firms that announce their financial restatements due to accounting irregularities. This list of restating firms was complied by the General Accounting Office (GAO) and discussed in the report titled "Financial Statement Restatements: Trends, Market Impacts, Regulatory Response, and Remaining Challenges." The GAO report was commissioned by the Chairman of the Committee on Banking, Housing and Urban Affairs of the U.S. Senate. The GAO identified 919 announcements of accounting restatements by 845 firms over the period 1/1/1997 to 6/30/2002 through a Lexis-Nexis search with variations of the word 'restate.' These announced restatements were due to alleged accounting irregularities resulting in material misstatements of financial reports. We use this list as the basis of this study. Note that the list specifically excludes routine restatements due to mergers and acquisitions, discontinued operations, stock splits, issuance of stock dividends, currency-related issues, changes in business segment definitions, changes due to transfers of management, changes made for presentation purposes, general accounting changes under GAAP, litigation settlements and arithmetic and general bookkeeping errors. The list also excludes restatements resulting from accounting policy changes because they did not necessarily reveal previously undisclosed, economically meaningful data to market participants. The GAO (2002) reports an average stock market reaction of –9.5% over day -1 to +1 surrounding the restatement announcement. Several

[3] Income decreasing restatements are those that have the effect of decreasing income at the time the restatement is announced. As the restatement reverses the prior fraudulent actions of the firm, this implies that the firm increased income during the cheating or violation period.

academic studies have relied on this restatement dataset. Examples include Agrawal and Chadha (2005), Agrawal and Cooper (2006, 2007), Burns and Kedia (2006), Kedia and Philippon (2009), Desai, Hogan and Wilkins (2006), Hribar and Jenkins (2004), and Srinivasan (2005).

We considered using two versions of the GAO sample for our analyses: (i) a full sample of all restatements in the GAO report; and (ii) a conservative sample that attempts to retain only serious and non-trivial restatements. All the reported tests in the paper rely on the full sample for four reasons. First, otherwise honest managers learn about the probability of detection and the expected punishment from cheating by observing the severity of the response of regulators, class action lawyers and the media to even trivial restatements by peer firms. The question of whether gatekeepers such as class action lawyers and regulators follow a "zero tolerance" policy of policing crime ("broken window" policy popularized by Mayor Giuliani in New York City) or whether they pursue offenders in a more selective manner is crucial to our question of how otherwise honest managers update their information sets about detection and expected payoff to dishonesty. Hence, unlike other papers that can hypothesize a clear relation between non-trivial restatements and outcomes such as option exercises (Burns and Kedia 2006), insider trading (e.g., Agrawal and Cooper 2006), or managerial job security (e.g., Agrawal and Cooper 2007), eliminating so-called trivial restatements is not a clear-cut design choice in our setting.

Second, restatements sometimes regarded as technical and income-neutral over time such as those involving accelerated revenue recognition in violation of SAB 101 are associated with significant negative stock price responses (Rountree 2003) perhaps due to the sullied corporate reputation of the violator. Hence, labeling restatements as trivial is not a straightforward exercise. Third, unlike the second GAO restatement data set that covers the period 7/1/2002 to 9/30/2005, the first GAO data set used in our study is not dominated by trivial restatements

(Hennes, Leone and Miller 2008). Four, restatements are a relatively rare event and our statistical tests, aimed at detecting innovation and subsequent imitation, rely heavily on the availability of several restatement observations across years. Nevertheless, for comparability with other studies that use a conservative sample, we present a robustness test that relies on a conservative sample (see section 3.4.5).

Before we proceed, two important caveats about restatements as a somewhat noisy proxy for earnings manipulation deserve mention. First, we cannot observe undetected crime, by definition. Hence, we attempt to assess whether imitators, who are eventually caught, begin managing earnings after we observe the confession of earnings manipulation by an innovator. Thus, our sample consists of innovators and the imitators both of whom are eventually caught in the end for managing earnings. We exploit the concurrent timing of the innovator's announcement and the imitator's beginning of the manipulation period to document contagion. Second, several papers claim that SEC AAERs and class action lawsuits are better proxies for accounting fraud relative to earnings restatements (Karpoff, Lee and Martin 2008a, b; Dyck, Morse and Zingales 2008). Accepting this claim in our paper would require conducting sensitivity analyses for a sample restricted to SEC AAERs and class action lawsuits. Note, however, that one of the principal objectives of our paper, as discussed in greater depth later, is to assess whether SEC AAERs and class action lawsuits actually deter contagion in earnings manipulation. Hence, restricting the sample to SEC AAERs and class action lawsuits would potentially eliminate all contagion in corporate misconduct although that is precisely what our paper sets out to document in the first place.

Our sample begins with restating firms as per the GAO report that report at least one year of sales in the period 1997 to 2001. To be useful for our analyses, we need to be able to identify

the period during which the firm was manipulating its books and the announcement date on which this manipulation was made public via an earnings restatement. Of the total of 919 restatement observations in the GAO report, we were able to identify a beginning date of the manipulation period for only 632 restatement observations. Of these, 139 firms had started manipulating their books before 1/1/97 and therefore we utilize the remaining 493 firms to investigate what potentially led these firms to begin misreporting.

Panel A of Table 1 provides data on the 632 firms that announced an earnings restatement during each of the years 1997-2002. Each firm that announces a restatement or reveals misreporting has the potential to influence the decision of honest firms to adopt misreporting in future years. Column 4 of the table reports the distribution of the 493 firms that began misreporting in this period and suggests that the number of earnings manipulators per year increases during the first four years (1997-2000) but starts declining thereafter in 2001 and 2002. One simple explanation for this trend is that the truncated sample in the GAO report does not report restatements announced after June 2002. That is, several firms that began manipulating their books during 2001 and 2002 might not have announced a restatement before June 30, 2002, the last announcement date covered by the GAO report. Given this inherent bias in the data, we restrict formal tests in the paper to only firms that begin cheating in the years 1997-2000.

Panel B presents data on the proportion of imitators in the sample. We define imitators as firms that begin manipulation in the calendar year subsequent to the calendar year in which announcements of restatements are made by innovators. Because the GAO data covers announcements only from 1/1/97, we have no imitators for 1997. Hence, the row against 1997 is 0% for all the columns of panel B. Column (1) shows that by 2002, imitators cumulatively constitute 6.56% of the all firms with available data in Compustat.

The proclivity to imitate a peer firm is likely stronger than the proclivity to imitate a random firm. Moreover, the social norms explanation suggests that managers will look at social norms towards cheating that prevail among their peer firms. Following Kedia and Rajgopal (2008, 2009), we identify a peer as a firm that belongs to the same industry (defined as the same two-digit SIC code) or whose operational headquarters is located in the same geographical neighborhood (the MSA or the metropolitan statistical area). Data on imitation within the industry and MSA is reported in Panel B of Table 1. Note that the proportion of imitators within the industry reported in column (2) represents the average over 72 two-digit SIC codes of the proportion of imitators within each of these two-digit SIC codes. Cumulative proportions are reported every year. Similarly, the third column reports the average over 475 MSAs of the proportion of imitators within each MSA cumulated till every year reported. By 2002, 3.47% of the average industry imitates earnings manipulation practices subsequent to an innovator's restatement announcement relative to 0.76% of the average MSA.

It is useful to compare the characteristics of innovators to the imitators beyond industry and geographic affinity. Doing so is difficult, however, as today's imitators might actually spawn future imitation. To address this difficulty, we present data that compares cohort groups of innovators with subsequent imitators. Since the first year of the restatement announcements in the GAO database is 1997, all firms that began cheating in 1997 are designated as innovators for the purpose of compiling Table 2 (but not for subsequent tables). Firms that began cheating in 1998 represent the first set of imitators that could have been influenced by the revelation of fraud in the prior year. Therefore all firms that announce a restatement till 1997 are designated as innovator firms in 1998. As can be seen in Table 2, in 1998, the innovators are smaller, less profitable and have more volatile earnings relative to firms that imitate them. In subsequent

years, there is no significant difference in firm characteristics between innovators and imitators. Absence of statistically significant differences in firm characteristics in subsequent years is not surprising. Because the imitators in 1998 are innovators for 1999, initial innovators, or firms that cheat originally without being influenced by others, are likely inherently unique. However, there are few differences between the first wave of imitators and those that imitate in later years. As an aside, detailed descriptive data on variables used in the paper are reported in panels B and C of Table 2.

3.2 Empirical specification

We focus on the dichotomous choice facing hitherto honest firms of whether to begin manipulating their financial statements during the year. For firm i in year t, label this decision DumCheat, where $DumCheat_{it} = 0$ if the firm does not begin manipulate its statements in year t and $DumCheat_{it} = 1$ if the firm begins manipulating its financial statements in year t. Recall that we examine the decision of firms to begin cheating from 1997 to 2000. We specify that the probability of beginning to cheat is given as follows:

$$DumCheat_{it} = \lambda_1 NATION\%_{t-1} + \lambda_2 IND\%_{t-1} + \lambda_3 MSA\%_{t-1} + bx_i^o + cx^{ind}_{it} + e_{it} \qquad (1)$$

In equation (1), $NATION\%_{t-1}$ is the cumulative percentage of firms that announced a restatement till the end of the prior year. $IND\%_{t-1}$ is the cumulative percentage of the industry that has announced a restatement till the end of the prior year. Industry is captured by the two-digit SIC code of the firm. Similarly, $MSA\%_{t-1}$ is the cumulative percentage of all firms headquartered in the Metropolitan Statistical Area or MSA that had announced a restatement till the end of the prior year. Note the cumulative nature of the variables IND%, MSA% and NATION%. That is, we assume that restatement announcements in 1997 and in 1998 can affect imitations in 1999

and so on. The cumulative aspect of IND%, MSA% and NATION% relies on the idea that fraud cases may impact decisions of otherwise honest managers for a long period of time. The resolution of the regulatory investigation or class action law suits, including the costs imposed by the fraud, such as jail time for the CEO, may take several years to transpire. Note also the date on which the firm begins to manipulate its books predates the announcement date of the restatement. Announcement of a restatement is the public revelation of the fraud (caught or discovered fraud). Such manipulation began in an earlier period but was only subsequently discovered. The median time period from the end of the manipulation period and the announcement of the restatement is about one year.

If there is contagion in corporate misconduct, then non-manipulators who are situated in industries and/or geographical areas (MSAs) where manipulators are prevalent will be more likely to manipulate financial statements (controlling for all other factors), leading to $\lambda_1 > 0$, $\lambda_2 > 0$ and/ or $\lambda_3 > 0$. Non-manipulators or honest firms consist of all firms on COMPUSTAT with available data that did not announce a restatement over the years 1997 to June 2002. This empirical specification is line with the Goolsbee and Klenow (2002) study of the diffusion in the use of personal computers. Goolsbee and Klenow (2002) themselves rely on (i) epidemiology models in which an infectious disease spreads more quickly the larger the fraction of the population infected; and (ii) the Bass (1969) model in the marketing literature which models the rate at which new products are adopted by consumers.

The X^o terms are firm-level observables. In the basic specification, these are market-to-book ratio, leverage, firm size as captured by the natural logarithm of total assets, prior year's ROA and earnings volatility. The expected benefits from earnings manipulation and therefore

the likelihood of earnings manipulation are high when (i) investment opportunities as captured by their market to book ratio are high; (ii) profitability (ROA) is low and earnings volatility is high; (iii) firm size is small as there is likely to be greater information asymmetry between the firm and the investor and potentially lower scrutiny of the firm; and (iv) leverage is high and firms may want to manage earnings to avoid tripping their debt covenants.

The X^{ind} terms represent industry level variables. As already documented in the by now extensive literature on corporate fraud, there is industry concentration in corporate fraud over our sample period. Of particular concern is that some of the contagion that we observe via a significant positive coefficient on IND% and MSA% might simply be attributable to industry characteristics that are positively associated with fraud. We introduce two industry-level variables to control for these industry characteristics. First, we include industry-level market to book ratio as a proxy for expected growth opportunities in the industry. The higher the growth opportunities in the industry the greater are likely to be the gains from earnings manipulation. This ratio is computed as the ratio of the sum of all book values in the two-digit SIC code to the sum of market values in the same two-digit SIC code. The second industry level variable we introduce is the Herfindahl index, a proxy for product market concentration. The intuition is that the greater the competition in the product market, the greater the pressure placed by analysts on firms to deliver performance in line with their nearest competitor's performance. Such pressure may increase the likelihood of managing earnings. Herfindahl index is computed as the sum of the squares of the market shares (firm sales / industry sales) of the firms in the industry.

3.3 Results

We start by presenting a pooled cross-sectional regression of the propensity to imitate on the proportion of firms that have already confessed to manipulating earnings in the previous

period in the nation as a whole and in their respective industry and MSA. As discussed above, the dependent variable is a binary variable that equals one if the firm begins manipulating financial statements in the year and zero otherwise. The independent variable of interest is the cumulative proportion of firms in the nation, in the industry, and in the MSA that has announced a restatement till the end of the prior year. As we regressions on pooled data, all p-values reported in the paper are calculated after clustering the standard errors by firm.

As seen in Model 1 of Table 3, firms' proclivity to begin manipulating earnings increases with the fraction of firms in the entire economy that have already announced a restatement. In other words, the larger the stock of fraudulent firms (the innovators), the greater is the likelihood that an honest firm chooses to begin cheating. Model 2 shows that a hitherto honest firm is more likely to start manipulating its books after other firms in the same industry have revealed manipulation of their financial statements (coefficient on IND% = 4.162, p-value < 0.01). This contagion within industry is robust to the inclusion of year effects (Model 3). Model 4 reports significant evidence of contagion within the MSA as well. The coefficient of MSA% is 3.363 with a p-value less than 0.01. Once again, contagion within MSA is robust to the inclusion of year effects. Finally, in the combined analysis reported in Model 7, we find that both industry and MSA level contagion appear to be incremental important to each other and continue to be statistically significant. Thus, industry and MSA both constitute complementary channels of contagion.

Table 4 reports the results after including all the firm and industry level controls. Significant evidence on contagion at the industry and MSA levels continues to persist after the inclusion all these control variables. Moreover the coefficients on IND% and MSA% are not substantially affected by the introduction of control variables, suggesting thereby that the

contagion effects documented via IND% and MSA% are reasonably robust to omitted variables. Such contagion at the industry and MSA level is not only statistically significant but also economically important. To evaluate the economic significance of such contagion, we interpret the marginal effects of IND% and MSA% reported in brackets under the coefficients in Table 4. The marginal effect for IND% in column (2) is 0.078. This marginal effect, when multiplied by the inter-quartile range of 0.025 for IND% from panel B in Table 3, suggests that moving from first quartile of IND% to the third quartile of IND% increases the probability of financial misreporting by imitators by approximately 0.196%. Considering that the unconditional sample mean for firms that begin cheating is 1.5% as per panel B of Table 3, this calculation represents an increase of 13% in the likelihood that a firm imitates earnings manipulation. Similarly, we find that moving from the first quartile to the third quartile of MSA% increases the likelihood of cheating by 7.5%. These calculations suggest an important, and hitherto undocumented, role for industry and MSA level contagion in financial misreporting.

Turning to the control variables, we find that firms that manipulate their books are larger and have lower book-to-market ratios. Moreover, they are likely to belong to industries that report lower book-to-market ratios suggesting that growing firms and firms in growing industries are more likely to manipulate their books. There is some evidence that firms that report more volatile earnings are also likely to begin earnings manipulation subsequent to a peer's restatement announcement.

3.4 Sources of contagion

Significant coefficients on IND% and MSA% documented thus far suggest that honest firms are more likely to adopt misreporting if other firms in their industry or MSA announce that they restated their financial statements. In this section we explore factors that are likely to

facilitate or mitigate industry and city level contagion. In particular, we examine the how SEC AAERs, class action lawsuits, media exposure, firm size and the nature of restatements influence the diffusion of misreporting practices. Another important purpose behind the tests to follow is to reassure readers that the contagion we document does not necessarily arise from some unobserved common traits related to industry membership or the imitator's location. Note that the unobserved common traits associated with industry membership or location should be the same for all firms in the industry or in that location. Hence, if we are able to identify hypothesized sources of contagion that vary within imitator's industry membership and/or location, we are more likely to have found potentially causal, as opposed to spurious, factors driving contagion.

3.4.1 Impact of SEC AAER

As discussed in section 2, honest firms are less likely to begin misreporting following restatements that are associated with SEC enforcement actions relative to those that are not accompanied by SEC intervention. To test this conjecture, we separate IND% into those restatement announcements that were accompanied by an SEC AAER within the calendar year in which the restatement is announced (IND%_AAER) and those announcements that are not followed by an SEC AAER within the calendar year of the restatement announcement (IND%_no_AAER). Thus, IND%_AAER (IND_no_AAER%) is the fraction of the industry that restated and was subject to (not subject to) a SEC AAER till the end of the prior year. Similarly, to examine the impact of the SEC on MSA level contagion, we separate the MSA% variable into

MSA_AAER% and MSA_no_AAER% sample. The data on SEC AAERs was collected from the AAER filings.[4]

We find that IND_no_AAER% has a positive coefficient that is significant at the 1% level (See Table 5, Model 1). The coefficient of IND_AAER%, however, is not statistically significant. More notably, the coefficient on IND_AAER% is not negative. This pattern implies that contagion within industries is confined to restatements announcements that are not followed by SEC AAERs. Recall that effective deterrence by the SEC ought to imply a negative coefficient on IND_AAER%. That is, honest firms are less likely to embark on earnings manipulation when the SEC investigates restatements. Although SEC involvement is associated with a lack of contagion, AAERs do not appear to actively deter honest firms from beginning to manipulate their books.

The impact of SEC investigations on MSA level contagion is seen in Table 6, Model 1. The results are qualitatively similar to industry level contagion. MSA level contagion is primarily seen in restatements that are not accompanied by an SEC AAER. The coefficient of MSA_AAER% is positive and even weakly significant suggesting once again that presence of the SEC is associated with insignificant contagion but not necessarily active deterrence of earnings manipulation.

3.4.2 Contagion following a class action lawsuit

Coffee (2006) suggests that class action lawsuits could potentially deter corporate misconduct. To test whether class action lawsuits indeed curb contagion, we define two variables: (i) IND%_LIT where the innovator's announcement of the restatement is followed by the announcement of a class action lawsuit within the calendar year of the restatement

[4] We are very grateful to Jonathan Karpoff for sharing the data with us. This data has been analyzed in Karpoff, Lee and Martin (2008 a and b).

announcement; and (ii) IND%_no_LIT where the innovator's announcement of a restatement is not followed by a lawsuit within the calendar year of the restatement announcement. Thus, IND%_LIT (IND%_no_LIT) is the fraction of the industry that restated and was subject to (not subject to) a class action lawsuit till the end of the prior year. As before, we also define MSA equivalents of these variables. Somewhat consistent with Coffee's (2006) intuition, we find that IND%_no_LIT acquires a positive coefficient that is significant at the 2% level (coefficient = 8.464, p-value = 0.02 in Table 5, Model 2). However, the coefficient of IND%_LIT is not statistically significant (p-value = 0.24). Again, absence of a class-action lawsuit mitigates contagion of earnings manipulation in the industry but does not actually lead to deterrence. If class action lawsuits served as deterrents to future misconduct, we would have expected the coefficient on IND%_LIT to be negative and statistically significant. The results are qualitatively similar for MSA%_LIT and MSA%_no_LIT in model 2 of Table 6.

3.4.3 Contagion following media coverage

Media coverage of the innovator's restatement can serve either as an advertisement for previously unknown dishonest behavior among peer managers or serve as a salient reminder of the severe penalties meted out to dishonest managers for cooking their books and hence potential deter contagion in corporate misconduct. To isolate the precise role that media coverage plays in contagion, we conduct a search of the Factiva database and identify press articles subsequent to a month after the restatement announcement. Next, we read each article and code the tone of media coverage as "negative." Although this is not an exhaustive list, we looked for following words or permutations thereof: (i) disagreement; (ii) allegations; (iii) artificially inflate; (iv) losses; (v) materially misstated; (v) misconduct; and (vi) downgrade. Any article that was not coded as negative in tone was classified as "non negative" media coverage.

We split IND% into two variables, one with non-negative media coverage (IND%_MEDIA) and one where restatement announcements get no media coverage or where the tone of coverage is negative (IND%_NO_or _NEG_MEDIA). We collapse the absence of media coverage and negative media coverage into one variable for the sake of parsimony (three interaction terms instead of two terms) and to highlight the idea that non-negative media coverage potentially encourages contagion in earnings manipulation. As before, we construct analogous variables for MSA%. We expect non-negative media coverage to encourage contagion. However, disapproving media coverage or media neglect is likely to discourage contagion. Consistent with this intuition, in Model 3 of Table 5, we find a positive and a statistically significant coefficient on IND%_MEDIA (coefficient = 9.695, p-value <0.04) and a statistically insignificant coefficient on IND%_NO_or NEG_MEDIA (coefficient = -1.483, p-value = 0.81). The MSA% results related to media coverage, reported under model 3 of Table 6, are qualitatively similar although MSA%_NO_or_NEG_MEDIA is positive and weakly significant (coefficient = 2.856, p-value = 0.09). Collectively, these results suggest that non-negative media coverage of the innovator's restatement promotes contagion whereas lack of media visibility or negative coverage of the restatement by the media is associated with smaller odds of contagion.

3.4.4 Contagion following larger firms' restatements

Besides public and private enforcement mechanisms and the nature of media coverage, the characteristics of the innovator can also impact contagion. In particular, we expect imitators to follow actions of large, visible and hence influential firms among their peers. To investigate this conjecture, we verify whether a larger innovator is likely to spawn more imitation than a

smaller innovator. We identify large innovators based on the median split of the restating firms' size of total assets. Model 4 of Table 5 reports results when IND% is split into two variables: (i) IND%_Large refers to large innovators and IND%_Small refers to small innovators. The coefficient on IND%_Large is positive and statistically significant (p-value < 0.01) whereas the coefficient on IND%_Small is not statistically significant (p-value = 0.15). Qualitatively similar inferences obtain from the MSA% version of this hypothesis reported under Model 4 of Table 6. In sum, these results suggest that larger manipulators are more likely to be associated with contagion.

3.4.5 Income-decreasing restatements

As discussed earlier in section 2.4, we expect greater contagion following income-decreasing restatements. To test this hypothesis, we hand-collect data on impact of the restatement announcement on the net income of the innovator. We only designate transactions that actually resulted in a decrease in net income as "income-decreasing." Transactions that shifted income across time periods (such as accelerated revenue recognition), which are normally thought of as legitimate instances of earnings manipulation, were not classified as income-decreasing.

To assess whether the nature of the restatement announcement affected contagion, we decompose IND% into two variables: (i), one with income-decreasing restatements labeled IND%_Income_Down; and (ii) another labeled IND%_Income Not-Down containing income-increasing or income-neutral restatements. As before, we construct MSA% versions of these variables and re-estimate model (1) again with these new interaction terms. Results reported in Model 5 of Table 5 shows that the coefficient on IND%_Income_Down is positive and significant (coefficient = 4.901, p-value < 0.01) whereas the coefficient on IND%_Income_Not-

Down is not significant (p-value = 0.29). The MSA version of the results, reported under model 5 of Table 6, is identical in spirit. Hence, imitators are more likely to follow innovators when the innovator actually managed to boost net income.

In the above analysis, we did not restrict imitation or the dependent variable to only income-decreasing restatements. That is, we allow even income-neutral restatements such as accelerated revenue recognition by imitators to be potentially affected by the innovators' income-decreasing restatements in the prior analysis. As a robustness test, we eliminate all restatements that do not result in a decrease in net income and re-estimate equation (1). The revised analysis only allows income-decreasing imitation as a reaction to income-decreasing restatement announcements by an innovator. Note that we only have 295 potential imitators in the restricted sample related to income-decreasing restatements relative to 493 imitators in the full sample. Despite the lower statistical power stemming from losing roughly 40% of the sample, results reported in Table 7 suggest the inferences discussed earlier with the larger sample largely hold even when income-decreasing restatements are considered. Contagion is most likely when the innovator is located in the same industry and the same MSA as the innovator. In particular, Model 2 of Table 7 shows that the coefficient on IND% is 3.878 (p-value = 0.08) whereas Model 3 of Table 7 reports that the coefficient on MSA% is 6.596 (p-value < 0.01). Thus, when considered on their own, both industry and MSA are potentially channels for contagion in income-decreasing activities. However, in a combined analysis, only MSA survives as a source for contagion in income-decreasing restatements (see Model 4 of Table 7). The coefficient on IND% in the combined analysis becomes insignificant (p-value = 0.57).

Table 8 reports results related to factors that facilitate or mitigate contagion in the MSA when the sample is restricted to income-decreasing restatements. All the inferences documented

earlier for the full sample hold strongly for MSA level contagion. That is, contagion is unlikely to be observed if the innovator's restatement is followed by an SEC AAER or a class action lawsuit. Non-negative media coverage of the innovator's restatement encourages contagion within the MSA. Surprisingly, negative or no media coverage is also associated with contagion although the coefficient on negative or no media coverage in Model 3 is smaller than that on non-negative media coverage suggesting that non-negative media coverage is still the more important driver of contagion. As before, restatement announcements by larger firms are more likely to spawn contagion in earnings manipulation.[5]

4.0 Conclusions

We find that managers of firms begin cooking their books after the news of an earnings restatement by the innovating firm is made public. In particular, imitators are more likely to start managing earnings when a higher fraction of their innovating peer firms in their industry or their MSA have confessed to managing earnings. We find that this contagion effect is unlikely to be explained by common unobserved traits related to industry membership as we are able to document systematic variation in contagion within the industry. In particular, intra-industry and intra-MSA contagion in earnings manipulation is curbed if the innovator is subject to a class action lawsuit or an SEC AAER. Interestingly, non-negative media exposure of the innovator's restatement encourages contagion in that such an event is associated with greater imitation whereas negative media exposure or absence of media coverage serves to mitigate contagion.

[5] Another way to assess the severity of the restatement is to consider the stock price decline associated with the revelation of earnings restatement. We do not use the stock price reaction to a restatement because we find several instances where firms bundled disclosures other than the restatement along with the restatement (such as positive future earnings guidance, the dismissal of a CEO/CFO, a dividend or a capital expenditure cut). Hence, the stock price reaction to the restatement announcement is unlikely to capture the market's perception of the restatement in an unbiased manner.

Larger innovators and income-decreasing restatements by innovators are associated with higher contagion.

Further research into identifying innovators and imitators would assist in directing enforcement efforts at potential innovators. Targeting innovators would curb contagion in corporate misconduct and hence efficiently extract the maximum bang for the policing buck. The presence of contagion in corporate crime also suggests that the cumulative impact of enforcement and policing will be significantly greater than their immediate impact of such regulatory efforts.

References

Agrawal, A., and S. Chadha. 2005. Corporate governance and accounting scandals. The Journal of Law and Economics 48: 371–406.

Agrawal, A. and T. Cooper. 2006. Insider trading before accounting scandals. Working paper, University of Alabama.

Agrawal, A. and T.Cooper. 2007. Corporate governance consequences of accounting scandals: Evidence from top management, CFO and auditor turnover. Working paper, University of Alabama.

Bass, F. M. 1969. A new product growth model for consumer durables. Management Science 15: 215–27.

Bandura, A. 1965. Influence of models' reinforcement contingencies on the acquisition of imitative responses. Journal of Personality and Social Psychology, 1, 589–595.

Bandura, A., D. Ross and S.A. Ross. 1961. Transmission of aggression through imitation of aggressive models. Journal of Abnormal and Social Psychology, 63, 575–582.

Bandura, A., D. Ross, D., and S.A. Ross. 1963. Imitation of film-mediated aggressive models. Journal of Abnormal and Social Psychology, 66, 3–11.

Becker, G. 1968. Crime and punishment: An economic approach. The Journal of Political Economy 76: pp. 169–217.

Becker, G. S. and K. M. Murphy. 2000. Social Economics: Market Behavior in a Social Environment. Cambridge, Mass: Belknap / Harvard Press.

Bergstresser, D., and T.Philippon. 2006. CEO incentives and earnings management: Evidence from the 1990s. Journal of Financial Economics 80: 511-529.

Bizjak , J., M. Lemmon and R. Whitby. 2009. Option backdating and board interlocks. Review of Financial Studies, Forthcoming. Available at SSRN: http://ssrn.com/abstract=946787.

Burns, N., and S. Kedia. 2006. The impact of performance-based compensation on misreporting. Journal of Financial Economics 79: 35-67.

Cialdini, R.B., and M.R. Trost. 1998. Social influence: Social norm, conformity, and compliance. In D.T. Gilbert, S.T. Fiske, & G. Lindzey (Eds.), Handbook of social psychology (Vol. 2, pp. 151–192). New York: McGraw-Hill.

Cheng, Q. and T. Warfield. 2005. Equity incentives and earnings management. The Accounting Review 80: 441-476.

Coffee, J. C. 2006. Reforming the securities class action: an essay on deterrence and its implementation. Columbia Law and Economics Working Paper No. 293. Available at SSRN: http://ssrn.com/abstract=893833.

Desai, H., C. Hogan and M. Wilkins. 2006. The reputational penalty for aggressive accounting: Earnings restatements and management turnover, Accounting Review 81: 83-112.

Duncan, G., J. Boisjoly, M. Kremer, D. M. Levy and J. Eccles. 2005. Peer effects in drug use and sex among college students. JournalJournal of Abnormal Child Psychology 33(3): 375-385.

Dyck, A., N. Volchkova and L. Zingales. 2008. The corporate governance role of the media: Evidence from Russia. Journal of Finance 63(3): 1093-1135.

Dyck, A., A. Morse and L. Zingales. 2008. Who blows the whistle on corporate fraud? Working Paper, University of Toronto and University of Chicago.

Farrell, K and D. Whidbee. 2002. Monitoring by the financial press and forced CEO turnover. Journal of Banking and Finance, 26 (2): 2249-76.

GAO. 2002. Financial Statement Restatements. General Accounting Office, Report to the U.S. Senate.

Glaeser, E. L., B. Sacerdote, and J. A. Scheinkman. 1996. Crime and social interactions. Quarterly Journal of Economics, 111, 507-548.

Gino F, S. Ayal S and D. Ariely. 2009. Contagion and differentiation in unethical behavior: the effect of one bad apple on the barrel. Psychological Science 20(3):393-8.

Goolsbee, A. and P. J. Klenow. 2002. Evidence on Learning and network externalities in the diffusion of home computers. Journal of Law and Economics, 45(2): 317-343.

Hennes, K., A. Leone, and B. Miller. 2008. The importance of distinguishing errors from irregularities in restatement research: The case of restatements and CEO/CFO turnover. The Accounting Review 83(6): 1487-1519.

Hicks, D.J. 1968. Effects of co-observer's sanctions and adult presence on imitative aggression. Child Development, 39, 303–309.

Hirshleifer, D. and S. H. Teoh. 2009. Thought and behavior contagion in capital markets. In T. Hens & K. Schenk-Hoppe (Eds.), Handbook of financial markets: Dynamics and evolution. pp. 1 – 56). Amsterdam: North Holland.

Hoxby, C. 2000. Peer effects in the classroom: Learning from gender and race variation. Cambridge, MA: NBER Working Paper 7867.

Hribar, P. and N. Jenkins. 2004. The effect of accounting restatements on earnings revisions and

the estimated cost of capital. Review of Accounting Studies 9(2-3): 337–356.

Karpoff, J.M., D. S. Lee, and G. S. Martin, 2008a. The consequences to managers for financial misrepresentation. Journal of Financial Economics, 88: 193-215.

Karpoff, J. M., D. S. Lee, and G. S. Martin, 2008b. The cost to firms of cooking the books. Journal of Financial and Quantitative Analysis, 43(3): 581-611.

Kedia, S., and T. Philippon. 2009. The economics of fraudulent accounting, Review of Financial Studies, 22(6): 2169-2199.

Kedia, S. and S. Rajgopal. 2008. Do the SEC's enforcement preferences affect corporate misconduct? Working Paper, Rutgers Business School and University of Washington.

Kedia, S. and S. Rajgopal. 2009. Neighborhood matters: The impact of location on broad based stock option plans. Journal of Financial Economics, 92(1): 109-127.

Ludwig, J. and J. R. Kling. 2007. Is crime contagious? Journal of Law and Economics 50:3 491-518.

Moreland, R. L., & Beach, S. (1992) Exposure effects in the classroom: The development of affinity among students. Journal of Experimental Social Psychology, 28, 255-276.

Rountree, B. 2003. The response to changes in revenue recognition rules. Working paper, University of North Carolina at Chapel Hill.

Sacerdote, B. 2001. Peer effects with random assignment: Results for Dartmouth roommates. The Quarterly Journal of Economics, 116(2): 681-704.

SEC, Securities and Exchange Commission. 2008. Division of Enforcement: Enforcement Manual. Available at http://www.sec.gov/divisions/enforce/enforcementmanual.pdf

Siegel, A.E., and L.G. Kohn. 1959. Permissiveness, permission, and aggression: The effect of adult presence or absence on aggression in children's play. Child Development, 30, 131–141.

Srinivasan, S. 2005. Consequences of financial reporting failure for outside directors: Evidence from accounting restatements and audit committee members. Journal of Accounting Research, 43: 291-334.

Tversky, A., and D. Kahneman. 1973. Availability: A heuristic for judging frequency and probability. Cognitive Psychology, 5, 207-232.

TABLE 1: Descriptive Statistics

Panel A: Breakdown of the Restating Firms

Calendar Year	No. of Firms Announcing Restatements	Cumulative No. of Firms Announcing Restatements	No. of Firms Beginning to Cheat	Cumulative No. of Firms Beginning to Cheat
	(1)	(2)	(3)	(4)
1997	70	70	67	67
1998	78	148	124	191
1999	119	267	127	318
2000	139	406	132	450
2001	152	558	40	490
2002	74	632	3	493

Panel A provides data on the 632 firms that announced an earnings restatement (announcers or innovators) during each of the years 1997-2002 and on the 493 firms that began manipulating their financial statements after the announcement.

Panel B: Breakdown of the Imitator Firms within Sample

Calendar Year	Imitators within Sample (1)	Imitators within Industry (2)	Imitators within Neighborhood (3)
1997	0.00%	0.00%	0.00%
1998	1.60%	0.60%	0.11%
1999	3.23%	1.53%	0.23%
2000	5.11%	2.73%	0.61%
2001	6.13%	3.16%	0.71%
2002	6.56%	3.47%	0.76%

Panel B reports imitators as a proportion of all "clean" firms on COMPUSTAT defined as firms with available data that did not report a restatement during the years 1997-2002. In panel B, innovator firms are those that announced a restatement prior to the beginning of the year. Imitator firms are those that begin cheating in the year in question. Industry membership is defined as a firm's membership to a two-digit SIC code. Neighborhood refers to the location of the imitator's operational headquarters in the same Metropolitan Statistical Area (MSA) as the innovator. The proportion of imitators within the industry (MSA) reported in column 2 (3) represents the across-industry (MSA) mean of the proportion of imitators within each two-digit SIC codes (MSA) cumulated till every year reported. We found 72 (475) two-digit SIC codes (MSAs) in our sample.

TABLE 2: Firm Characteristics

Panel A: Comparison of Firm Level Characteristics of Innovator and Imitator Firms
Innovator firms are those that announced a restatement prior to the beginning of the year. Imitator firms are those that begin cheating in the year in question. LnAssets is log of total assets, BMR is the book to market ratio, Leverage is the ratio of long term debt to total assets, ROA is return on assets and EarnVol is earnings volatility.

Cohort	Type	LnAssets	BMR	Leverage	ROA	EarnVol
1998	Innovators	4.706	0.454	0.177	-0.220	0.071
	Imitators	5.414	0.425	0.165	-0.046	0.050
	Difference	-0.707	0.030	0.011	-0.174	0.021
	p-value	0.01	0.55	0.66	0.01	0.04
1999	Innovators	5.138	0.598	0.177	-0.140	0.059
	Imitators	4.959	0.553	0.185	-0.082	0.046
	Difference	0.179	0.045	-0.008	-0.058	0.013
	p-value	0.47	0.50	0.72	0.25	0.11
2000	Innovators	5.283	0.658	0.190	-0.144	0.061
	Imitators	5.538	0.539	0.195	-0.328	0.086
	Difference	-0.255	0.119	-0.005	0.184	-0.025
	p-value	0.27	0.06	0.82	0.01	0.03
2001	Innovators	5.640	1.106	0.177	-0.183	0.061
	Imitators	6.206	0.666	0.166	-0.092	0.042
	Difference	-0.566	0.441	0.012	-0.091	0.019
	p-value	0.13	0.11	0.73	0.43	0.18

TABLE 2: Firm Characteristics (Continued)

Panel B: Descriptive Characteristics of Pooled Sample Variables

Variable	No. of Obs	Mean	Median	Standard Deviation	25th Percentile	75th Percentile
DumCheat	30975	0.015	0.000	0.123	0.000	0.000
NATION%	30975	0.015	0.009	0.012	0.000	0.019
IND%	30975	0.015	0.010	0.018	0.000	0.026
MSA%	30975	0.014	0.007	0.024	0.000	0.021
BMR	26131	0.630	0.491	0.552	0.266	0.809
LEVERAGE	30110	0.178	0.090	0.219	0.002	0.288
LNASSETS	30110	4.655	4.630	2.346	3.023	6.257
ROA	28555	-0.165	0.018	0.751	-0.085	0.077
EARNVOL	29150	0.070	0.020	0.175	0.007	0.058
HERFINDEX	30975	0.079	0.048	0.095	0.037	0.082
IND_BMR	30975	0.327	0.285	0.154	0.218	0.429

TABLE 2: Firm Characteristics (Continued)

Panel C: Correlation Table (Pearson Above / Spearman Below) of Pooled Sample Variables

	DumCheat	NATION%	IND%	MSA%	BMR	LEVERAGE	LNASSETS	ROA	EARNVOL	HERFINDEX	IND_BMR
DumCheat	1.000	0.013**	0.016***	0.017***	-0.027***	-0.001	0.026***	0.002	-0.006	-0.003	-0.025***
NATION%	0.013**	1.000	0.682***	0.500***	0.097***	0.027***	0.014**	-0.077***	0.076***	0.012**	-0.092***
IND%	0.018***	0.803***	1.000	0.369***	0.036***	-0.003	-0.055***	-0.094***	0.081***	-0.033***	-0.157***
MSA%	0.016***	0.655***	0.579***	1.000	0.044***	0.009	0.001	-0.050***	0.047***	0.006	-0.073***
BMR	-0.029***	0.059***	-0.002	-0.018***	1.000	0.065***	-0.052***	0.109***	-0.104***	0.056***	0.239***
LEVERAGE	0.004	0.013**	-0.030***	-0.023***	0.118***	1.000	0.186***	0.033***	-0.055***	0.024***	0.169***
LNASSETS	0.024***	0.024***	-0.037***	-0.033***	0.064***	0.321***	1.000	0.296***	-0.400***	-0.117***	0.263***
ROA	0.016***	-0.078***	-0.056***	-0.076***	-0.065***	-0.012**	0.307***	1.000	-0.609***	-0.035***	0.176***
EARNVOL	0.015**	0.048***	0.116***	0.139***	-0.267***	-0.187***	-0.641***	-0.403***	1.000	0.087***	-0.162***
HERFINDEX	0.010*	0.036***	0.012**	0.055***	-0.051***	0.048***	-0.144***	0.016***	0.229***	1.000	-0.043***
IND_BMR	-0.027***	-0.169***	-0.256***	-0.190***	0.324***	0.207***	0.296***	0.123	-0.382***	-0.122***	1.000

NOTES: DumCheat is a dummy variable set = 0 if the firm does not manipulate statements and = 1 if the firm manipulates during the years 1997-2000. NATION%, as the fraction of firms in the entire sample that confess to earnings manipulation. IND% is the fraction of industries that in the same two-digit SIC industry that announce restatements. MSA% is the fraction of firms headquartered in the Metropolitan Statistical Area that announce restatements in the same MSA. BMR is the book-to-market ratio. LEVERAGE refers to leverage, computed as the ratio of long-term debt to total assets. LNASSETS is the natural logarithm of total assets. ROA refers to return-on-assets, computed as the ratio of earnings before extraordinary items to beginning-of-year total assets. EARNVOL is earnings volatility, computed as the standard deviation of earnings before extraordinary items for the 12 quarters ending with the year of observation. HERFINDEX refers to the Herfindahl index for that firm's two-digit SIC industry, computed as the sum of the squares of the market shares (firm sales / industry sales) of the firms in the industry. IND_BMR refers to the industry-level book-to-market ratio, computed by dividing the sum of all book values in the two-digit SIC code by the sum of market values in the same two digit SIC code.*, **, *** indicates significance level (2-tailed) at 10%, 5% and 1% respectively.

TABLE 3: Basic Model on Propensity to Imitate Earnings Manipulation

This table displays results of a pooled logit regression where the dependent variable takes the value 1 if the firm begins misreporting in the year and zero otherwise. Nation% is the percentage of all public firms with data on Compustat that have announced a restatement till the prior year. Ind% is the percentage of all firm in the same two digit SIC that have announced a restatement till the prior year. MSA% is the percentage of all firms headquartered in the same MSA that have announced a restatement till the prior year. The p values, corrected for firm level clustering, are reported in parenthesis and the marginal effects in brackets.

	Nation	**Industry**		**City**		**All**	
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*
Intercept	-4.299 (<0.01)	-4.241 (<0.01)		-4.220 (<0.01)		-4.298 (<0.01)	
Nation%	8.482 (0.02) [0.127]					2.069 (0.63) [0.031]	
Ind%		4.612 (<0.01) [0.069]	3.51 (0.01) [0.052]			3.491 (0.01) [0.052]	3.52 (0.01) [0.052]
MSA%				3.363 (<0.01) [0.05]	2.76 (0.06) [0.041]	2.754 (0.06) [0.041]	2.76 (0.07) [0.041]
Year Effects	No	No	Yes	No	Yes	No	Yes
No. of Obs.	30975	30975	30975	30975	30975	30975	30975
Puesdo R^2	0.0011	0.0013	0.0017	0.0014	0.0020	0.0022	0.0024

TABLE 4: Propensity to Imitate Earnings Manipulation After Control Variables

This table displays results of a pooled logit regression where the dependent variable takes the value 1 if the firm begins misreporting in the year and zero otherwise. Nation% is the percentage of all public firms with data on Compustat that have announced a restatement till the prior year. Ind% is the percentage of all firm in the same two digit SIC that have announced a restatement till the prior year. MSA% is the percentage of all firms headquartered in the same MSA that have announced a restatement till the prior year. BMR is the book-to-market ratio, LEVERAGE is the ratio of long-term debt to total assets, LNASSETS is the log of total assets, ROA is the ratio of earnings before extraordinary items to beginning-of-year total assets, EARNVOL is the standard deviation of earnings before extraordinary items for the 12 prior quarters, HERFINDEX is the sales Herfindahl index for that firm's two-digit SIC industry and IND_BMR refers to the value weighted industry book-to-market ratio. The p values, corrected for firm level clustering, are reported in parenthesis and the marginal effects in brackets.

	Nation	**Industry**	**MSA**	**All**
Intercept	-4.104 (<0.01)	-4.077 (<0.01)	-4.027 (<0.01)	-4.126 (<0.01)
Nation%	8.816 (0.02) [0.133]			2.046 (0.67) [0.031]
Ind%		5.182 (<0.01) [0.078]		3.737 (0.05) [0.056]
MSA%			3.398 (0.01) [0.051]	2.867 (0.08) [0.043]
BMR	-0.398 (<0.01) [-0.006]	-0.381 (<0.01) [-0.006]	-0.379 (<0.01) [-0.006]	-0.395 (<0.01) [-0.006]
LEVERAGE	0.030 (0.91) [0.000]	0.039 (0.88) [0.001]	0.040 (0.88) [0.001]	0.031 (0.91) [0.000]
LNASSETS	0.090 (<0.01) [0.001]	0.095 (<0.01) [0.001]	0.093 (<0.01) [0.001]	0.091 (<0.01) [0.001]
ROA	0.084 (0.37) [0.001]	0.082 (0.38) [0.001]	0.075 (0.42) [0.001]	0.085 (0.37) [0.001]
EARNVOL	0.575 (0.10) [0.009]	0.589 (0.09) [0.009]	0.582 (0.09) [0.009]	0.571 (0.10) [0.009]
HERFINDEX	0.209 (0.69) [0.003]	0.187 (0.73) [0.003]	0.209 (0.69) [0.003]	0.213 (0.69) [0.003]
IND_BMR	-1.276 (<0.01) [-0.019]	-1.306 (<0.01) [-0.020]	-1.344 (<0.01) [-0.020]	-1.231 (<0.01) [-0.018]
No. of obs	25412	25412	25412	25412
Pseudo R2	0.0137	0.0138	0.0141	0.0149

TABLE 5: Sources of Contagion Within Industry

This table displays results of a pooled logit regression where the dependent variable takes the value 1 if the firm begins misreporting in the year and zero otherwise. In SEC AAER or Model 1, IND_1% (IND_0%) is the percentage of the industry that announces a restatement that results (does not result) in an SEC AAER till the prior year. In Class Litigation or Model 2, IND_1% (IND_0%) refers to the percentage of the industry that announces a restatement that results in (does not result in) class action lawsuit till the prior year. In Media Coverage, IND_1% (IND_0%) refers to the percentage of the industry's restatements that receives non-negative media coverage (no media coverage or negative media coverage) till the prior year. For Large Firms or Model 4, IND_1% (IND_0%) refers to the percentage of the industry that announces a restatement and is a large (small) firm. A large firm is one with assets greater than the median assets for the industry in that year. In Income Decreasing or Model 5, IND_1% (IND_0%) is the percentage of the industry that announces an income decreasing (other) restatement. BMR is the book-to-market ratio, LEVERAGE is the ratio of long-term debt to total assets, LNASSETS is the log of total assets, ROA is the ratio of earnings before extraordinary items to beginning-of-year total assets, EARNVOL is the standard deviation of earnings before extraordinary items for the 12 prior quarters, HERFINDEX is the sales Herfindahl index for that firm's two-digit SIC industry and IND_BMR refers to the value weighted industry book-to-market ratio. The p values, corrected for firm level clustering, are reported in parenthesis.

	SEC AAER	**Class Litigation**	**Media Coverage**	**Large Firms**	**Income Decreasing**
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-4.119 (<0.01)	-4.112 (<0.01)	-4.081 (<0.01)	-4.089 (<0.01)	-4.084 (<0.01)
IND_1%	74.735 (0.11)	2.833 (0.24)	9.695 (<0.04)	4.667 (0.01)	4.901 (<0.01)
IND_0%	4.740 (<0.01)	8.464 (0.02)	-1.483 (0.81)	6.739 (0.15)	6.425 (0.29)
BMR	-0.383 (<0.01)	-0.386 (<0.01)	-0.389 (<0.01)	-0.384 (<0.01)	-0.383 (<0.01)
LEVERAGE	0.044 (0.87)	0.036 (0.89)	0.053 (0.85)	0.038 (0.89)	0.040 (0.88)
LNASSETS	0.097 (<0.01)	0.094 (<0.01)	0.094 (<0.01)	0.095 (<0.01)	0.095 (<0.01)
ROA	0.076 (0.41)	0.086 (0.35)	0.084 (0.37)	0.082 (0.38)	0.083 (0.37)
EARNVOL	0.583 (0.09)	0.581 (0.09)	0.592 (0.09)	0.586 (0.09)	0.586 (0.09)
HERFINDEX	0.289 (0.59)	0.284 (0.61)	0.187 (0.74)	0.213 (0.70)	0.199 (0.72)
IND_BMR	-1.251 (<0.01)	-1.264 (<0.01)	-1.303 (<0.01)	-1.287 (<0.01)	-1.289 (<0.01)
No. of obs	25412	25412	25412	25412	25412
Pseudo R^2	0.0143	0.0140	0.0141	0.0138	0.0138

TABLE 6: Sources of Contagion Within MSA

This table displays results of a pooled logit regression where the dependent variable takes the value 1 if the firm begins misreporting in the year and zero otherwise. In SEC AAER or Model 1, MSA_1% (MSA_0%) is the percentage of the MSA that announces a restatement that results (does not result) in an SEC AAER till the prior year. In Class Litigation or Model 2, MSA_1% (MSA_0%) refers to the percentage of the MSA that announces a restatement that results in (does not result in) class action lawsuit till the prior year. In Media Coverage, MSA_1% (MSA_0%) refers to the percentage of the MSA's restatements that get non-negative media coverage (no or negative media coverage) till the prior year. For Large Firms or Model 4, MSA_1% (IND_0%) refers to the percentage of the MSA that announces a restatement and is a large (small) firm. A large firm is one with assets greater than the median assets for the industry in that year. In Income Decreasing or model 5, MSA_1% (MSA_0%) is the percentage of the MSA that announces an income decreasing (other) restatement. BMR is the book-to-market ratio, LEVERAGE is the ratio of long-term debt to total assets, LNASSETS is the log of total assets, ROA is the ratio of earnings before extraordinary items to beginning-of-year total assets, EARNVOL is the standard deviation of earnings before extraordinary items for the 12 prior quarters, HERFINDEX is the sales Herfindahl index for that firm's two-digit SIC industry and IND_BMR refers to the value weighted industry book-to-market ratio. The p values, corrected for firm level clustering, are reported in parenthesis.

	SEC AAER	**Class Litigation**	**Media Coverage**	**Large Firms**	**Income Decreasing**
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-4.058 <0.01	-4.033 <0.01	-4.026 <0.01	-4.012 <0.01	-4.019 <0.01
MSA_1%	82.311 0.10	5.137 0.14	3.514 0.03	5.247 <0.01	5.681 <0.01
MSA_0%	3.258 0.02	3.259 0.03	2.856 0.09	1.045 0.41	-0.600 0.75
BMR	-0.377 <0.01	-0.380 <0.01	-0.379 <0.01	-0.386 <0.01	-0.390 <0.01
LEVERAGE	0.038 0.89	0.043 0.87	0.039 0.89	0.037 0.89	0.032 0.91
LNASSETS	0.093 <0.01	0.092 <0.01	0.093 <0.01	0.093 <0.01	0.094 <0.01
ROA	0.076 0.42	0.075 0.42	0.075 0.42	0.075 0.42	0.076 0.42
EARNVOL	0.581 0.09	0.578 0.10	0.582 0.09	0.592 0.09	0.578 0.10
HERFINDEX	0.221 0.67	0.208 0.69	0.208 0.69	0.201 0.70	0.207 0.70
IND_BMR	-1.302 <0.01	-1.337 <0.01	-1.345 <0.01	-1.366 <0.01	-1.375 <0.01
No. of obs	25412	25412	25412	25412	25412
Pseudo R^2	0.0147	0.0142	0.0141	0.0148	0.0153

TABLE 7: Robustness Tests Using Income-Decreasing Restatement Sample

In this table the sample of firms that restate is restricted to those that announce income-decreasing restatement. This table displays results of a pooled logit regression where the dependent variable takes the value 1 if the firm begins misreporting in the year and zero otherwise. Nation% is the percentage of all public firms with data on Compustat that have announced a restatement till the prior year. Ind% is the percentage of all firm in the same two digit SIC that have announced a restatement till the prior year. MSA% is the percentage of all firms headquartered in the same MSA that have announced a restatement till the prior year. BMR is the book-to-market ratio, LEVERAGE is the ratio of long-term debt to total assets, LNASSETS is the log of total assets ROA is the ratio of earnings before extraordinary items to beginning-of-year total assets, EARNVOL is the standard deviation of earnings before extraordinary items for the 12 prior quarters, HERFINDEX is the sales Herfindahl index for that firm's two-digit SIC industry and IND_BMR refers to the value weighted industry book-to-market ratio. The p values, corrected for firm level clustering, are reported in parenthesis.

	Nation	**Industry**	**MSA**	**All**
	Model 1	Model 2	Model 3	Model 4
Intercept	-4.410 (<0.01)	-4.364 (<0.01)	-4.370 (<0.01)	-4.399 (<0.01)
Nation%	9.808 (0.24)			0.350 (0.97)
Ind%		3.878 (0.08)		2.057 (0.57)
MSA%			6.596 (<0.01)	6.464 (<0.01)
BMR	-0.564 (<0.01)	-0.551 (<0.01)	-0.582 (<0.01)	-0.585 (<0.01)
LEVERAGE	0.063 (0.86)	0.068 (0.85)	0.049 (0.89)	0.043 (0.90)
LNASSETS	0.049 (0.10)	0.053 (0.08)	0.050 (0.10)	0.050 (0.09)
ROA	0.048 (0.65)	0.043 (0.68)	0.047 (0.660	0.048 (0.65)
EARNVOL	0.740 (0.08)	0.758 (0.07)	0.734 (0.08)	0.734 (0.08)
HERFINDEX	0.008 (0.99)	-0.007 (0.99)	0.013 (0.98)	0.016 (0.98)
IND_BMR	-0.934 (0.05)	-0.991 (0.04)	-0.971 (0.05)	-0.943 (0.05)
No. of obs	25412	25412	25412	25412
Pseudo R2	0.0115	0.0114	0.0156	0.0157

TABLE 8: Within MSA Sources in Income Decreasing Sample

The sample for this table is restricted to firms that announce income decreasing restatements. This table displays results of a pooled logit regression where the dependent variable takes the value 1 if the firm begins misreporting in the year and zero otherwise. In SEC AAER or Model 1, MSA_1% (MSA_0%) is the percentage of the MSA that announces a restatement that results (does not result) in an SEC AAER till the prior year. In Class Litigation or Model 2, MSA_1% (MSA_0%) refers to the percentage of the MSA that announces a restatement that results in (does not result in) class action lawsuit till the prior year. In Media Coverage, MSA_1% (MSA_0%) refers to the percentage of the MSA that gets non-negative media coverage (no or negative media coverage) till the prior year. For Large Firms or Model 4, MSA_1% (IND_0%) refers to the percentage of the MSA that announces a restatement and is a large (small) firm. A large firm is one with assets greater than the median assets for the industry in that year. BMR is the book-to-market ratio, LEVERAGE is the ratio of long-term debt to total assets, LNASSETS is the log of total assets, ROA is the ratio of earnings before extraordinary items to beginning-of-year total assets, EARNVOL is the standard deviation of earnings before extraordinary items for the 12 prior quarters, HERFINDEX is the sales Herfindahl index for that firm's two-digit SIC industry and IND_BMR refers to the value weighted industry book-to-market ratio. The p values, corrected for firm level clustering, are reported in parenthesis.

	SEC AAER	**Class Litigation**	**Media Coverage**	**Large Firms**
	Model 1	Model 2	Model 3	Model 4
Intercept	-4.378 (<0.01)	-4.352 (<0.01)	-4.381 (<0.01)	-4.323 (<0.01)
MSA_1%	101.500 (0.25)	0.251 (0.98)	8.108 (<0.01)	7.296 (<0.01)
MSA_0%	6.395 (<0.01)	6.874 (<0.01)	3.765 (0.01)	-5.793 (0.47)
BMR	-0.581 (<0.01)	-0.581 (<0.01)	-0.586 (<0.01)	-0.582 (<0.01)
LEVERAGE	0.043 (0.90)	0.045 (0.90)	0.027 (0.94)	0.048 (0.89)
LNASSETS	0.048 (0.110	0.051 (0.09)	0.047 (0.12)	0.051 (0.09)
ROA	0.046 (0.67)	0.046 (0.66)	0.047 (0.66)	0.046 (0.66)
EARNVOL	0.727 (0.09)	0.742 (0.08)	0.721 (0.09)	0.756 (0.07)
HERFINDEX	-0.006 (0.99)	0.019 (0.98)	0.004 (0.99)	0.025 (0.97)
IND_BMR	-0.959 (0.05)	-0.995 (0.04)	-0.918 (0.06)	-1.017 (0.04)
No. of obs Pseudo R^2	25412 0.0161	25412 0.0158	25412 0.0156	25412 0.0164