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Do Class Action Filings Affect Stock Prices? The Stock Market Reaction to Securities Class Actions Post PSLRA

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DO CLASS ACTION FILINGS AFFECT STOCK PRICES? THE STOCK MARKET REACTION TO SECURITIES CLASS ACTIONS POST PSLRA

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Abstract

Using a substantially larger sample than has been used before, and a sample that includes the Great Financial Crisis and its ensuing recession, I investigate the stock market reaction to securities class action filings following the enactment of the Private Securities Litigation Reform Act through the first quarter of 2012. I find that, on average, even after adjusting for market downturns, there is a statistically significant negative abnormal return at the time of filing. There is also a statistically significant negative abnormal return during the weeks preceding the filing indicating that the market partially, but not fully, anticipates these filings. Additionally I find the following: filings that include a § 10(b) claim have a more adverse impact than those that do not; filings that are subsequently dismissed have a smaller adverse impact than those that are not, indicating that the market has some ability to distinguish between claims with different degrees of merit; filings in the Ninth Circuit have a more adverse impact than others, especially when compared with the Second Circuit; and finally, filings against non-service sector firms have a more adverse impact than those against service sector firms, and financial firms in the service sector suffer more when claims are filed than non-financial service firms.

I. INTRODUCTION

There have been many attempts to assess the impact of securities class action filings.[1] Some of these have been speculative in nature and some have been empirical.[2] Some of the empirical work has been anecdotal, and some has been statistical.[3] The passing of the Private

[1] *See generally* Stephen J. Choi, *The Evidence on Securities Class Actions*, 57 VAND. L. REV. 1465, 1476-1507 (2004) (surveying numerous empirical investigations of securities class actions).

[2] *See, e.g.*, Douglas M. Branson, *Running the Gauntlet: A Description of the Arduous, and Now Often Fatal, Journey for Plaintiffs in Federal Securities Law Actions*, 65 U. CIN. L. REV. 3, 3-5 (1996) (providing a persuasive, but speculative, analysis of the state of securities class actions); James D. Cox et al., *Does the Plaintiff Matter? An Empirical Analysis of Lead Plaintiffs in Securities Class Actions*, 106 COLUM. L. REV. 1587, 1589-90 (2006) (providing an empirical inquiry into the performance of the lead plaintiff provision in securities class actions).

[3] *See, e.g.*, Tom Baker & Sean J. Griffith, *How the Merits Matter: Directors' and Officers' Insurance and Securities Settlements*, 157 U. PA. L. REV. 755, 759-60 (2009) (conducting an anecdotal study based on the interviews of over

Securities Litigation Reform Act of 1995 (PSLRA)[4] prompted even more effort towards attempting to assess whether the legislation resulted in any of its desired objectives.[5]

Surprisingly, there has been relatively little use of event studies to investigate the impact. Event study methodology is a powerful tool that has been exploited heavily in academic studies in finance since it was first introduced in 1969 by Fama, Fischer, Jensen, and Roll.[6] There have been thousands of published event studies, and even more working papers and unpublished Ph.D. dissertations.[7] Although event studies are not a staple of legal research, they have been used repeatedly by Professor Roberta Romano to examine the impact of reincorporation, takeover statutes, and shareholder derivative suits.[8] Scholars have also utilized event study methodology in legal research, such as investigating the wealth effects of inter-firm litigation.[9]

There has been one publication in the field of finance that uses event study methodology to investigate post PSLRA securities class

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fifty people involved in securities class action settlements); James D. Cox et al., *There Are Plaintiffs and . . . There Are Plaintiffs: An Empirical Analysis of Securities Class Action Settlements*, 61 VAND. L. REV. 355, 367 (2008) (conducting statistical analysis of 773 settlements).

[4] Private Securities Litigation Reform Act of 1995, Pub. L. No. 104-67, 109 Stat. 737 (codified as amended in scattered sections of 15 & 18 U.S.C.).

[5] *See*, *e.g.*, Stephen J. Choi, *Do the Merits Matter Less After the Private Securities Litigation Reform Act?*, 23 J. L. ECON. & ORG. 598, 600 (2007) (providing an empirical assessment of the impact of the PSLRA on meritorious litigation).

[6] Eugene F. Fama et al., *The Adjustment of Stock Prices to New Information*, 10 INT'L ECON. REV. 1, 3-4 (1969).

[7] A February 12, 2014 search on the term "event study" in abstracts in the SSRN library produced 1,294 papers. *Cf.* JOHN Y. CAMPBELL ET AL., THE ECONOMETRICS OF FINANCIAL MARKETS 149 (1997) ("The general applicability of the event-study methodology has led to its wide use.").

[8] *See, e.g.*, Roberta Romano, *Law as a Product: Some Pieces of the Incorporation Puzzle*, 1 J.L. ECON. & ORG. 225 (1985) [hereinafter Romano, *Law as a Product*] (conducting event study on impact of reincorporating); Roberta Romano, *The Political Economy of Takeover Statutes*, 73 VA. L. REV. 111, 181-87 (1987) (reporting event study of takeover statutes); Roberta Romano, *The Shareholder Suit: Litigation Without Foundation?*, 7 J.L. ECON. & ORG. 55, 65-67 (1991) (providing results for an event study of shareholder derivative suits).

[9] *See, e.g.*, Sanjai Bhagat et al., *The Shareholder Wealth Implications of Corporate Lawsuits*, 27 FIN. MGMT. 5, 15 (1998) (measuring wealth effects of corporate lawsuit filings and settlements using event study methodology).

action filings; however, that paper only utilizes data through 2003.[10] The strength of financial research methodology is the ability to construct very powerful statistical tests.[11] Strengths, however, are often coupled with weaknesses—the proverbial double-edged sword. In order to get power behind the test statistics used in event study methodology, it is necessary to have very large data sets.[12] Collection of large data sets requires patience, as time must pass to generate the data.[13] The passage of time coupled with the recent financial crisis creates both a larger data set and the possibility of more sources of variation in the data, which improves our ability to statistically discern small impacts.[14] The purpose of this article is to provide an event study of securities class action filings using a larger data set than has been done previously, and to make the study accessible to the legal scholars who have the ability to impact the future of securities regulation through public commentary, briefs, litigation support, and teaching future securities lawyers.[15]

I utilize the Stanford Securities Class Action Clearinghouse Database (SCAC), which contains data on all securities class action

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[10] Amar Gande & Craig M. Lewis, *Shareholder-Initiated Class Action Lawsuits: Shareholder Wealth Effects and Industry Spillovers*, 44 J. FIN. & QUANTITATIVE ANALYSIS 823, 824 (2009).

[11] *Cf.* CAMPBELL ET AL., *supra* note 7, at 3 ("Financial economics is a highly empirical discipline, perhaps the most empirical among the branches of economics and even among the social sciences in general.").

[12] *Cf.* DAVID ANDERSON ET AL., ESSENTIALS OF STATISTICS FOR BUSINESS AND ECONOMICS: ABBREVIATED EDITION 209 (4th ed. 2007) (explaining that the statistical margin of error is inversely related to the sample size).

[13] *Cf.* MICHAEL O. FINKELSTEIN & BRUCE LEVIN, STATISTICS FOR LAWYERS 283 (2d ed. 2001) ("Below the gold standard we have what are called observational studies. In such studies, as the name suggests, we do not create the data but assemble and examine what already exists.").

[14] *See* ANDERSON ET AL., *supra* note 12, at 201 ("[A] larger sample size will provide a smaller margin of error, a narrower interval, and greater precision.").

[15] *See* Mark Klock, *Lessons Learned from Bernard Madoff: Why We Should Partially Privatize the Barney Fifes at the SEC*, 42 ARIZ. ST. L.J. 783, 832 (2010) ("If we [lawyers] had such preparation [in finance and analytical methods], we might have fewer financial catastrophes and panics."); Jose Gabilondo, *Financial Moral Panic! Sarbanes-Oxley, Financier Folk Devils, and Off-Balance-Sheet Arrangements*, 36 SETON HALL L. REV. 781, 850 (2006) ("I call on my transactional law colleagues to foster more integration of analytical financial methods into a basic legal education. Such an approach might produce more transactional lawyers capable of spotting and stemming future financial moral panics.").

filings in federal court subsequent to the passage of the PSLRA.[16] The first step was to download information about all filings from the beginning of the database in January 1996 to the end of the first quarter of 2012. This provided 3,457 securities class-action filings. The next step was to match the firms in SCAC with the University of Chicago's Center for Research in Security Prices database (CRSP) on stock returns for publicly traded exchange-listed and NASDAQ stocks.[17] The resulting sample contains 845 useable securities class action filing events with necessary stock return data to conduct an event study. This is substantially larger than any previous study.[18]

With this data, I am able to analyze the general overall impact of the filing of class-action lawsuits. I find evidence that the market reacts negatively to the mere filing of a class action, that some of the negative impact leaks into the market before the actual filing, and that there is no bounce subsequent to the filing.[19] With this large sample, I am able to examine several other questions as well: whether the market is able to distinguish meritorious filings from meritless filings at the time of the filing; whether the market reacts stronger to different types of class action claims (e.g., general fraud, errors in the registration statement, tender offer violations, investment company act violations, breach of fiduciary duty); whether the market reacts stronger to claims brought in different circuits; and whether the market reacts stronger to claims in certain economic sectors (e.g., services, and financial services).

The remainder of this article is organized as follows. Section II reviews prior literature on securities class actions. Section III describes the data used in the current study, and provides a basic introduction to statistical methods. Section IV explains the specific method used here—the event study. Section V presents the statistical results and Section VI provides conclusions.

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[16] STAN. L. SCH. SEC. CLASS ACTION CLEARINGHOUSE, http://perma.cc/5DKL-F92V (last visited Feb. 12, 2014).

[17] *Data Access Tools*, CENTER FOR RES. IN SEC. PRICES, http://perma.cc/ASK2-7QX8 (last visited Feb. 12, 2014).

[18] *See, e.g.*, Gande & Lewis, *supra* note 10, at 826 ("This reduces the sample for such analysis to 377 class action lawsuits.").

[19] *See infra* Table 2 (showing statistically significant negative reaction).

II. PRIOR LITERATURE

A. Securities Class Actions before the PSLRA

Perhaps the earliest attempt to conduct an empirical study of securities class action litigation in the legal literature was performed by Janet Cooper Alexander. [20] Although Alexander's study was commendable for attempting what others had not, it suffered some serious methodological shortcomings that caused the author's conclusion to be received with great skepticism.[21] Alexander limited her analysis to one type of securities class action (lawsuits based on IPOs), during one six month period (the first half of 1983), and in one specific sector (computer-related companies). [22] As a result, she identified only seventeen potential companies,[23] of which just nine were sued.[24] Of these nine, only eight were settled at the time of her study. [25] Alexander attempted to draw some inferences between the strength of claims and the size of settlements, and argued that the data showed that the merits of a case are not reflected in the outcomes.[26] But with a sample of only eight observations and many possible explanatory variables, she was not able, and did not attempt, to perform any statistical analysis.[27]

A more comprehensive study of securities class action lawsuits arising out of the new issues market was published in 1996 by James Bohn and Stephen Choi.[28] They looked at all filings for a twelve-year period covering 1975 to 1986, and therefore avoided the small sample problems associated with the Alexander study.[29] The focus of their study was to determine whether frivolous suits dominate meritorious suits, and

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[20] Janet Cooper Alexander, *Do the Merits Matter? A Study of Settlements in Securities Class Actions*, 43 STAN. L. REV. 497 (1991).
[21] *See, e.g.*, Baker & Griffith, *supra* note 3, at 757 ("Alexander's article is still widely cited even though its empirical foundation has been undermined . . . .").
[22] Alexander, *supra* note 20, at 506.
[23] *Id.* at 510.
[24] *Id.* at 511-12.
[25] *Id.* at 517.
[26] *See id.* at 517 (calling the results striking); *see also id.* at 519 (concluding that "the outcomes of the sample cases either fall into a range so narrow that it can be described as a flat rate, or vary for reasons that can be explained by factors other than the merits").
[27] *See generally* Alexander, *supra* note 20.
[28] James Bohn & Stephen Choi, *Fraud in the New-Issues Market: Empirical Evidence on Securities Class Actions*, 144 U. PA. L. REV. 903 (1996).
[29] *Id.* at 912.

Bohn and Choi concluded that they do.[30] Additionally, using event study methodology, Bohn and Choi found that securities class action filings resulted in a statistically significant stock price drop around a three-day window of the time of filing regardless of merit, and that the market did not fully anticipate the filings.[31] However, Bohn and Choi's data ended long before the passage of the PSLRA, which was intended to curb abuses in securities class action filings.[32] Thus, the empirical question of whether the PSLRA was successful remained unanswered after the 1996 publication of Bohn and Choi's research.

B. The PSLRA

The PSLRA was created to deter plaintiff's attorneys from filing frivolous class action claims on the belief that such claims were prevalent and created unnecessary corporate expenses in litigating and settling strike suits.[33] The Act created a number of procedural hurdles for filing class actions in federal court.[34] One provision made it easier for institutional investors to take control of the litigation in the dual beliefs that institutional investors would more effectively monitor merit-based cases, and would be less inclined to pursue frivolous cases.[35] Under the PSLRA, filings must advertise the action "in a widely circulated national business-oriented publication or wire service."[36] In the ninety-day period

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[30] *Id.* at 979

[31] *Id.* at 978.

[32] *Id.* at 912.

[33] *See* Mark Klock, *Lighthouse or Hidden Reef? Navigating the Fiduciary Duty of Delaware Corporations' Directors in the Wake of Malone*, 6 STAN. J.L. BUS. & FIN. 1, 31 (2000) ("This law was ostensibly intended to reduce perceived abuses in class actions brought in federal court under the securities laws.").

[34] *See* Branson, *supra* note 2, at 4 ("Because of the many instruments that now exist with which blows can be administered, only the toughest plaintiff who can be swift at times and crafty at others and who has an extraordinarily meritorious suit, generous funding, the most able of counsel, and extreme staying power will survive.").

[35] *See* Cox et al., *supra* note 2, at 1588 ("The lead plaintiff provision was adopted to encourage a class member with a large financial stake to become the class representative. Congress expected that such a plaintiff would actively monitor the conduct of a securities fraud class action so as to reduce the litigation agency costs . . . .").

[36] Private Securities Litigation Reform Act of 1995, Pub. L. No. 104-67, § 101(a), 109 Stat. 737, 738 (codified as amended at 15 U.S.C. §§ 77z-1 (a)(3)(A)(i)).

following publication, the court must consider motions by other purported class members to take control of the suit "as the 'Most Adequate Plaintiff.'" [37] This deters smaller plaintiff's attorneys from making the effort to initiate an action.[38] Other provisions require that the alleged fraud be pleaded with particularity and that discovery be stayed until defendants' motions to dismiss are resolved.[39] Some commentators have considered "[t]he PSLRA's most forceful blow to the securities class action [to be] the combination of the Act's tightened pleading requirements and its bar to discovery until the defendants' motions to dismiss have been resolved."[40]

A great deal of commentary from securities law professors harshly criticized the PSLRA for dealing with a non-existent problem, and for creating onerous obstacles to recovery for fraud. [41] These

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[37] *Id.* at 739.

[38] Jill E. Fisch, *Class Action Reform: Lessons from Securities Litigation*, 39 ARIZ. L. REV. 533, 547 (1997). Professor Fisch observes:

> To the extent that the Reform Act allows small shareholders to file suit but permits institutional investors to take control of the litigation away from the filing plaintiff, it preserves for the small investor only the opportunity to incur the costs associated with drafting and filing a complaint and eliminates meaningful access to the judicial system. The anticipation that individual plaintiffs and their lawyers may lose control of filed cases through the appointment of others as lead plaintiffs also diminishes the incentive for smaller investors to investigate instances of fraud and initiate legal action.

Id.

[39] *See* Richard H. Walker & J. Gordon Seymour, *Recent Judicial and Legislative Developments Affecting the Private Securities Fraud Class Action*, 40 ARIZ. L. REV. 1003, 1023 (1998) (discussing the Act's heightened pleading requirements and stay of discovery).

[40] James D. Cox & Randall S. Thomas, *SEC Enforcement Heuristics: An Empirical Inquiry*, 53 DUKE L. J. 737, 741 (2003).

[41] *See, e.g.*, Joel Seligman, *The Merits Do Matter: A Comment on Professor Grundfest's "Disimplying Private Rights of Action Under the Federal Securities Laws: The Commission's Authority*," 108 HARV. L. REV. 438, 457 (1994) ("What has been most lacking in the legislative debate to date has been authentic data that provides empirical or theoretical support for particularized law revision. If there is a case for significant changes in the federal securities class action law, it simply has not been presented to date."); *see also id.* at 439-53 (criticizing studies that claimed to support a conclusion that securities class action strike suits were a significant problem).

obstacles were widely considered to undermine investor protection and make it more difficult for honest firms to raise capital.[42] Commentators attributed the flood of class action suits that led to the reforms as being the effects of the earlier tax-shelter wave, which had finished working its way through the courts, and the high-tech IPO wave, which was subsiding.[43] One commentator described the specific provisions of the

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[42] In the context of discussing the PSLRA, Professor Lynn Stout explained:

> In lay terms, fraud is bad for securities markets because it erodes investor confidence. This occurs because fraud makes it difficult for investors to detect differences in the quality of the securities they buy. Companies issuing bad securities--poorly run firms that throw away money and do a poor job for their investors--can sell their securities at about the same price as well-managed firms, because fraud makes it impossible for investors to easily distinguish between high-quality and low-quality firms.
>
> What happens in such a market? Very quickly the market gets flooded with bad firms, because fraud allows them to sell worthless securities at high prices. Until, of course, investors learn that they can't distinguish between good and bad companies. When that happens, investors begin to discount the quality of all the securities in the market. In other words, they lose confidence in the market, and will no longer pay high prices even to good firms selling quality securities. At this point, the good firms exit the market, because they can't get a decent price for their securities. The market comes to be dominated only by dubious firms willing to sell at very low prices because their securities are in fact worth even less. This is the "market for lemons" phenomenon first described by the economist George Ackerlof many years ago.

Lynn A. Stout, *Type I Error, Type II Error, and the Private Securities Litigation Reform Act*, 38 ARIZ. L. REV. 711, 713 (1996).

[43] In Professor Branson's words:

> All of these extreme measures constitute a permanent solution taken in response to what undoubtedly will turn out to have been a temporary problem. If the federal courts have been flooded with securities cases, much of the flood was in response to the tax shelters put together in the 1980s. Much of the litigation that resulted was meritorious, but more importantly, the last of those cases is now working its way through the courts, and the flood has ebbed. Another source has been the so-called stockdrop lawsuit in which professional plaintiffs join with a cadre of plaintiffs' securities law firms to ascribe any precipitous price drop to nefarious actions within

Act as weapons in an arsenal intended to prevent a securities plaintiff from successfully running the gauntlet to get an opportunity for justice.[44]

C. Securities Class Actions after the PSLRA

Professors James Cox and Randall Thomas conducted an empirical analysis of securities class action filings on the tenth anniversary of the PSLRA.[45] They did not use event study methodology, nor examine the impact of filings on the stock market.[46] Rather, they focused on whether the lead-plaintiff provision was successful in increasing the proportion of provable losses that are recovered in settlement.[47] They were shocked to find that the percentage of provable losses recovered actually declined and suggested one interpretation of this finding is that if Congress wishes to help defrauded investors the PSLRA should be repealed in its entirety.[48] In contrast to their findings, Michael Perino used a larger sample of pre- and post-PSLRA filings with more controls in his study and found that, in the cases where public pension funds serve as the lead plaintiff, recoveries are larger and attorneys' fees are lower since the enactment of the PSLRA.[49] Additionally, Cox, Thomas and Bai conducted a follow-up study which found improvement in the performance of institutions serving as lead plaintiffs and concluded "that they add substantial value to the outcome."[50]

> smaller and newly public corporations. The increase in those suits merely tracks an explosion in initial public offerings (IPOs) made by high tech companies in 1992 and in 1993. The courts were well on their way to managing the explosion when Congress intervened.

See Branson, *supra* note 2, at 4-5.

[44] *Id.* at 4.

[45] *See* Cox et al., *supra* note 2, at 1589-90 ("Now, more than ten years after the enactment of the lead plaintiff provision . . . we inquire empirically whether the lead plaintiff provision has performed as projected.").

[46] *See id.* at 1591-92 (outlining their empirical methodology).

[47] *See id.* (focusing on "the ratio of settlement amounts to provable losses" as "the most important indicator of whether investors are being compensated for their damages").

[48] *Id.* at 1592.

[49] *See* Michael Perino, *Institutional Activism Through Litigation: An Empirical Analysis of Public Pension Fund Participation in Securities Class Actions*, 9 J. EMPIRICAL LEGAL STUD. 368, 369-70 (2012).

[50] Cox et al., *supra* note 3, at 385.

These conflicting results address only one narrow question as to the effectiveness of the lead-plaintiff provision of the PSLRA. Eric Helland looked at the broader question of whether allegations of fraud tend to be meritorious using a different methodology focusing on directors' reputations.[51]

> If private securities class actions alleging fraudulent behavior by officers or directors of a company are meritorious, directors and officers should pay a reputational penalty when they sit on a board of a company whose officers and directors are accused of fraud. I find little evidence of a negative effect associated with allegations of fraud. Using various definitions of board positions as a proxy for the reputation of directors who are accused of fraud, I find that the net number of board positions is consistently increased. Only in shareholder class actions in the top quartile of settlements or in which the Securities and Exchange Commission has initiated a case do directors appear to suffer a reputational penalty when a board they serve on is accused of fraud. The results call into question the merits of private securities class actions.[52]

Helland's finding that directors suffer no adverse effects from class action lawsuits is not inconsistent with the conclusion that stockholders do suffer adverse effects. But clearly it is inconsistent with the conclusion that some researchers have drawn that the PSLRA has limited frivolous class actions, and that the lead-plaintiff provision is working well to improve recovery in meritorious actions. Many questions remain unanswered, or answered with conflicting inferences.

There has been one post PSLRA event study published in the finance literature.[53] Gande and Lewis also investigate shareholder-initiated class action lawsuits and find a negative reaction to the filings of lawsuits as well as partial anticipation of the lawsuits by the market.[54]

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[51] Eric Helland, *Reputational Penalties and the Merits of Class-Action Securities Litigation*, 49 J. L. & ECON 365, 366 (2006) ("In this study I find that for the average case, there is no evidence of a negative effect on reputation associated with allegations of fraud. In fact, directors accused of fraud increase their net number of board positions for almost all measures of new board positions.").

[52] *Id.* at 365.

[53] Gande & Lewis, *supra* note 10, at 824 (analyzing class action lawsuits initiated between 1996 and 2003).

[54] *Id.* at 823.

Their study differs from this study in several important respects. First, their sample ends in 2003, and therefore only covers half of the time covered in this study and excludes the Great Financial Crisis.[55] The current study contains 845 observations. Gande and Lewis have some results based on 605 observations, but since they are also interested in providing comparisons with some non-sued firms in the same industry as the sued firms, they must merge their sample with another database, which does not contain data for many of their 605 observations.[56] Consequently, most of their analysis in confined to a subset of 377 observations.[57] Given that standard errors of estimates are proportional to the inverse of the square root of the number of observations, their standard errors will be approximately fifty percent larger than those in this study.[58]

Additional differences between the Gande and Lewis study and this study are that Gande and Lewis do not collect data on what happens to the filing (e.g., whether the suit settles, survives, or is dismissed on motion), the circuit in which the filing takes place, and the legal basis for the suit (e.g., § 10(b) or some other grounds).[59] The larger sample containing the Great Financial Crisis introduces more variation, and the possibility for achieving more precise calculation of the effects of filings.[60] Additionally, the other variables collected provide some ability to assess other interesting questions, such as whether the legal basis for the filing leads to larger or smaller effects, whether the circuit in which the filing occurs matters, and whether the market is able to distinguish which filings are likely to be dismissed.

There is one other unpublished study that uses the Stanford Securities Class Action Clearinghouse database and covers filings

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[55] *Id.* at 824 (describing that the samples used consisted of suits filed in and before 2003).

[56] *Id.* at 826 ("Our initial analysis of shareholder losses around a lawsuit filing date uses the full sample of 605 filings. However, our subsequent analysis . . . requires that firms (both sued and nonsued) also be available on Compustat and First Call.").

[57] *Id.*

[58] $\sqrt{845}/\sqrt{377}=1.497$.

[59] Gande & Lewis, *supra* note 10, at 826-27 (describing data collected).

[60] *See* ANDERSON ET AL., *supra* note 12, at 237 (giving the formula for the size of confidence interval, which just depends on three variables: significance level, variability of the population, and sample size).

through 2006.[61] Jennings, Kedia, and Rajgopal investigate whether private and SEC initiated actions result in subsequently less aggressive accounting practices by peer firms in the same industry.[62] They find that "[t]he average peer firm, subject to SEC action and/or litigation, reduces discretionary accruals equivalent to 14% to 22% of the median return on assets (ROA) in the aftermath of such enforcement."[63] Their study is obviously relevant to the policy debate about whether securities litigation provides benefits in the form of deterrence, but their methodology and the precise questions they investigate are different from this study.

It is clear that there continues to be differences of opinion about the effectiveness of the securities laws in the wake of the PSLRA.[64] In this study, I use the largest available sample to investigate these questions. First, does the mere filing of a securities class action lawsuit result in a statistically significant negative reaction in the market place at the time of filing? Second, is there a discernible negative reaction that occurs before the filing, indicating possible anticipation of the legal action? Third, does the market overreact to the announcement of the filing, which would be suggested if the price subsequently bounces back in the weeks following the commencement of litigation? Fourth, does the market have the same reaction to all filings or does the market react less to frivolous filings, defined as filings that are subsequently dismissed on motion? Fifth, is the magnitude of the market reaction related to the legal basis for the filing? Sixth, is the magnitude of the market reaction related to the circuit in which the filing occurs? And seventh, is the magnitude of the reaction related to the economic sector the business operates in?

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[61] *See* Jared Jennings et al., *The Deterrent Effects of SEC Enforcement and Class Action Litigation*, 13 (2011), *available at* http://perma.cc/M5U2-4D8D (last visited February 12, 2014) ("We use the Stanford Securities Class Action Clearinghouse to identify class action lawsuits filed between 1996 and 2006.").

[62] *See id.* at 1 ("[W]e investigate whether SEC enforcement actions and class action lawsuits, over the years 1996-2006, deter aggressive financial reporting behavior among the peers of fraudulent firms.").

[63] *Id.*

[64] *Compare* Barbara Black, *Stoneridge Investment Partners v. Scientific-Atlanta, Inc.: Reliance on Deceptive Conduct and the Future of Securities Fraud Class Actions*, SEC. REG. L. J., Summer 2008, at 6-7 (asserting that the PSLRA is ineffective), *with* Cox et al., *supra* note 3, at 386 ("[T]he PSLRA is working and likely working well.").

III. THE DATA AND STATISTICAL METHODS IN GENERAL

A. Data

This sample is drawn from all securities class action filings in federal court, as contained in the Stanford Securities Class Action database.[65] 3,586 records of class action filings were downloaded. From these, the 1,142 observations for which the firms exist in the CRSP database were identified. Of those, 845 actually contained the amount of data required during the period of study to use. These 845 observations form the baseline event study calculated to examine the question whether, on average, securities class action filings have a statistically discernible negative impact on stock price after adjusting for fluctuations in the overall market.

Table 1 describes the various subsamples that are investigated and the number of observations in each. The sample is split once based on the type of claim—10(b) versus not 10(b). The sample is also split on disposition—survived or dismissed. The sample is further split into filings in the Ninth Circuit, Second Circuit, and all other circuits combined. The others are combined because individually each has a relatively small number of filings. Finally, the sample is split based on economic sector—non-services and services, and the service sector is further split into different components: financial services and the narrowly defined service sector. These last two categories are also combined to create a service sector that excludes transportation and communications services.

TABLE 1
Attributes of the Sample

Total # of filings in baseline event study	845
# involving 10(b) claims	723
# not involving 10(b) claims	122

[65] STAN. L. SCH. SEC. CLASS ACTION CLEARINGHOUSE, *supra* note 16.

# which survived	502
# which were dismissed	343
# in the Ninth Circuit	189
# in the Second Circuit	312
# in all other circuits	344
# in Non-Services	400
# in Services	445
# in Financial Services	162
# in Narrow Service Sector (SIC 70-89)	206

B. Hypothesis Testing

If the filing of a class action lawsuit against a firm has no impact on the firm's value, then, on average, firms with such filings should have actual returns equal to their anticipated returns at the time the claims are filed, and their abnormal return (the deviation between the actual and anticipated return) should be zero on average.[66] There are several reasons

[66] *See* Sanjai Bhagat & Roberta Romano, *Event Studies and the Law: Part I: Technique and Corporate Litigation*, 4 AM. L. & ECON. REV. 141, 143 (2002) ("[A]n event is said to have an impact on the financial performance of a firm if it produces an abnormal movement in the price of the stock."); *id.* at 148

why class action filings might not have any discernible impact at the time of filing.[67] One is that the market might have already anticipated the filing and incorporated the impact into the firm valuation previously.[68] Another reason is that the market might not care about filings because they are considered to be mostly frivolous and disposed of at low cost.[69] And another reason is that the market could be inefficient, and react sluggishly to the filing days or weeks afterwards.[70]

Even if the average abnormal return on the event date is different from zero, we cannot immediately conclude that the event had an impact on firm value because if the true impact is zero, deviations from zero will be observed by random chance in the sampling process.[71] In order to conclude that the event impacts firm value, the deviation must be large enough to be statistically discernible, meaning too large to believe that it occurred by random chance if there really was no impact.[72] This is what statisticians and statistical researchers refer to as statistical significance.[73]

(explaining that the abnormal return is zero "if an event has no impact on firm value").

[67] *See, e.g.*, Gande & Lewis, *supra* note 10, at 829 (explaining that the impact could be mitigated "because firms carry insurance that is designed to defray the cost of class action lawsuits," and "industry experts believe that settlement amounts are highly correlated with policy limits").

[68] *See* CAMPBELL ET AL., *supra* note 7, at 179-80 (explaining that events which are anticipated in advance, for one example regulatory changes, will not result in a change in value at the actual time of the anticipated event).

[69] *See* Sanjai Bhagat & Roberta Romano, *Event Studies and the Law: Part II: Empirical Studies of Corporate Law*, 4 AM. L. & ECON. REV. 380, 404-05 (2002) (explaining that price will not react to corporate events that do not affect corporate value).

[70] *See* STEPHEN A. ROSS ET AL., CORPORATE FINANCE 343-44 (6th ed. 2002) (explaining that a market which is not efficient will have a lengthy delay in the price response to new information).

[71] *See, e.g.*, Mark Klock, *Finding Random Coincidences While Searching for the Holy Writ of Truth: Specification Searches in Law and Public Policy or Cum Hoc Ergo Propter Hoc?*, 2001 WISC. L. REV. 1007, 1018 & n.71 (explaining in detail how deviations from the population mean occur in random samples).

[72] *See id.* at 1018-19 (explaining that in order to conclude that an estimate is different from a hypothesized value, it must be far enough from that value to conclude that the difference is unlikely due to random chance).

[73] *See* Mark Klock, *Cooperation and Division: An Empirical Analysis of Voting Similarities and Differences During the Stable Rehnquist Court Era—1994 to 2005*, 22 CORNELL J.L. & PUB. POL'Y 537, 570 (2013) (explaining statistical significance).

Classical hypothesis testing involves specifying a maintained hypothesis (called the null) and then using data to either reject the null or accept the null.[74] There are four possible outcomes: a true null can be accepted; a true null can be rejected; a false null can be accepted; a false null can be rejected.[75] The second and third outcomes involve errors, and they are labeled Type I and Type II error, respectively.[76] The probability of a Type I error is set by the statistical researcher and is also called the level of significance.[77] Thus, a 10% significance level means that the statistician has set limits such that if the null hypothesis were true, it would not be falsely rejected 90% of the time.[78] A 1% significance level means that the statistician has set limits such that if the null hypothesis were true, it would not be falsely rejected 99% of the time.[79] Statistically significant differences from zero means that the discrepancies are so large as to be very unlikely to have been generated by random chance if the null of no difference were true, hence, we reject the null in this case.[80]

Discrepancies are measured in standard deviations.[81] For estimates, the size of the standard deviation decreases with the size of the sample.[82] This means that for large samples, small discrepancies can be many standard deviations away from zero.[83] Thus, the size of the discrepancy required to have statistical significance diminishes with the

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[74] *See* Klock, *supra* note 71, at 1018 (explaining that a sample is used to test a null hypothesis against an alternative).
[75] *Id.* at 1020.
[76] *See id.* (defining Type I and Type II errors).
[77] *See* ANDERSON ET AL., *supra* note 12, at 225–26 (explaining the meaning of Type I error and significance level).
[78] *See id.* at 226 (explaining that statistical significance at the α level means that the discrepancy is large enough that if in fact the true difference were zero, a discrepancy of that magnitude would only occur with a probability of α).
[79] *Cf.* Klock, *supra* note 73, at 573 ("At a 5% level of significance, my test statistic will incorrectly reject a true null hypothesis 5% of the time, if the sampling is done correctly.").
[80] *Id.* at 570-71.
[81] *See* FINKELSTEIN & LEVIN, *supra* note 13, at 21 (describing that standardization of random variables "expresses the variable or data in terms of numbers of standard deviations from the mean").
[82] *See id.* at 20 (stating that the standard deviation of the sample mean is $\sigma / \sqrt{n}$).
[83] Klock, *supra* note 71, at 1018 ("The probability of getting an estimate of a given size error approaches zero as the sample size increases . . . .").

sample size.[84] To illustrate this point, consider an effort to collect data to determine whether heads and tails are equally likely. Suppose that a coin is flipped twice. If heads and tails really are equally likely, half of the time the data will result in two of the same results.[85] However, if we flip a coin four hundred times and heads and tails are equally likely, 90% of the time this experiment is done the proportion of flips that come up heads will be between 46% and 54%.[86] If we quadruple the sample size, we will cut the margin of error in half.[87] Thus, the larger the sample size, the easier we can discern a false null hypothesis.[88]

IV. EVENT STUDY METHODOLOGY

As everyone knows, the stock market is volatile.[89] Thus, when an event such as the filing of a lawsuit happens, a drop in price cannot necessarily be ascribed to that event since the market might have had a down day causing most stocks to have a price drop.[90] Likewise, a small increase in stock price on the day of a bad event might still be considered a negative effect if the market had a strong rally that day and most stock prices rose substantially.[91] In order to assess the impact of the event on

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[84] *See* ANDERSON ET AL., *supra* note 12, at 237 (showing that the size of the margin of error is proportional to $1/\sqrt{n}$ where n is the sample size).

[85] Klock, *supra* note 71, at 1018 (describing the possible outcomes in a random sample of two).

[86] This is calculated as $.5 \pm 1.645(.5/\sqrt{400})$. *See* FINKELSTEIN & LEVIN, *supra* note 13, at 171 (giving the formula for this calculation).

[87] *See* ANDERSON ET AL., *supra* note 12, at 237 (showing that the size of the margin of error is proportional to $1/\sqrt{n}$ where n is the sample size, hence when n increases by a factor of 4, the margin of error is cut in half).

[88] *See id.* (observing that the do-not-reject region for a null hypothesis becomes smaller as the sample size becomes larger).

[89] *See* ROSS ET AL., *supra* note 70, at 348 ("[S]tock prices fluctuate from day to day.").

[90] *Cf.* Choi, *supra* note 1, at 1478-79 (discussing the weakness in studies that involve a single calendar date due to their inability to eliminate the possibility of a confounding event that moved prices on that day).

[91] *See* ZVI BODIE ET AL., INVESTMENTS 355 (9th ed. 2011) (explaining how to calculate damages using the actual return relative to the expected return based on general market movements); FREDERIC S. MISHKIN & STANLEY G. EAKINS, FINANCIAL MARKETS & INSTITUTIONS 129 (7th ed. 2012) (explaining that if good news is announced but not as good as what was anticipated the price declines).

the stock market, we need to have a model of normal returns.[92] The actual returns are then differenced from the normal returns to calculate abnormal returns.[93] With a large sample of events, statistical tests can be conducted on the abnormal returns to determine whether they are statistically discernible from zero—that is, whether the differences are unlikely to be due to random chance fluctuations.[94] The most prevalent model of normal returns adjusts returns for both the specific stock risk and the overall stock market. This is known as "risk and market adjusted returns," or the market model.[95]

Event study methodology was first introduced by Fama, Fisher, Jensen, and Roll with a publication in February 1969.[96] They used data from the Center for Research in Security Prices (CRSP) collected at the University of Chicago.[97] At the time, the database contained monthly price and dividend data on all New York Stock Exchange (NYSE) listed stocks from January 1926 to December 1960.[98] More recent versions of the data contain daily data, as well as data on NASDAQ stocks beginning December 1962.[99]

Subsequent to the first event study, event studies have been conducted in massive quantities by doctoral students and finance faculty to investigate whether and how the market reacts to an inexhaustible variety of events.[100] Some theoretical-based criticisms of the

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[92] *See* BODIE ET AL., *supra* note 91, at 353 (explaining that a benchmark return must be constructed and "[m]any researchers have used a 'market model' to estimate abnormal returns").

[93] *See id.* (equation 11.2).

[94] *See* Bhagat & Romano, *supra* note 66, at 146-47 (explaining the process of computing the statistical significance of the abnormal return).

[95] *See* Stephen J. Brown & Jerold B. Warner, *Measuring Security Price Performance*, 8 J. FIN. ECON. 205, 208 (1980) [hereinafter *Measuring Security Price Performance*] (describing the model for risk and market adjusted returns).

[96] *See* Ray Ball, *The Theory of Stock Market Efficiency: Accomplishments and Limitations*, 35 *in* DONALD H. CHEW, JR., THE NEW CORPORATE FINANCE (2d ed. 1999) (noting that a new research design called an event study was introduced in 1969 by Fama, Fischer, Jensen, and Roll).

[97] *See id.* at 39 (describing the establishment of the CRSP data).

[98] *See* Eugene F. Fama et al., *supra* note 6, at 3 n.6 ("At the time this study was conducted, the file covered the period January, 1926 to December, 1960."); *see also supra* text accompanying note 3.

[99] *CRSP US Stock Databases*, CENTER FOR RES. IN SEC. PRICES, http://perma.cc/66Y6-VY9S (last visited Feb. 12, 2014).

[100] *See* CAMPBELL ET AL., *supra* note 7, at 149 (describing the wide variety of event studies); Bhagat & Romano, *supra* note 66, at 142 ("The event study methodology is well accepted and extensively used in finance. Event study

methodology were published casting some doubt about our ability to interpret the results.[101] But in 1980, Stephen Brown and Jerold Warner published a Monte Carlo simulation study of event study methodology and concluded that a simple methodology based on the market model is both well specified and relatively powerful under a wide variety of conditions; and in special cases, even simpler methods also perform well.[102] This study took actual stock return data and then introduced abnormal performance of known and varying magnitudes and with several hundred simulations tested the ability of event study methodology to accurately identify the abnormal performance when it existed, and the ability to not find abnormal performance where it did not exist.[103] The methodology performed very well, and continued to gain widespread acceptance.[104]

In those days, PC's were non-existent, data storage was expensive, and time on mainframe computers was a scarce commodity.[105] Event studies were conducted using monthly data.[106] With

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results have been used in several hundred scholarly articles in leading academic finance journals to analyze corporate finance issues . . . ."); Eugene F. Fama, *Efficient Capital Markets: II* 46 J. FIN. 1575, 1600 (1991) ("Event studies are now an important part of finance . . . . Now we are overwhelmed with results, mostly from event studies.").

[101] *See* Myron Scholes & Joseph Williams, *Estimating Betas from Nonsynchronous Data*, 5 J. FIN. ECON. 309, 309 (1977) (observing that trading in different securities, which is not contemporaneous, introduces a potentially serious estimation problem in empirical finance research).

[102] *Measuring Security Price Performance*, *supra* note 95, at 249.

[103] *See id.* at 212 (discussing the procedure for introducing abnormal performance into the data).

[104] *See* CAMPBELL ET AL., *supra* note 7, at 180 ("Much has been learned from the body of research that uses event-study methodology. . . . We expect that event studies will continue to be a valuable and widely used tool in economics and finance.").

[105] *Cf.* Mark Klock, *Improving the Culture of Ethical Behavior in the Financial Sector: Time to Expressly Provide for Private Enforcement Against Aiders and Abettors of Securities Fraud*, 116 PENN ST. L. REV. 437, 480-81 (2011) (observing that data processing costs have dropped since the early 1980s).

[106] *See, e.g.*, Guy Charest, *Dividend Information, Stock Returns and Market Efficiency – II*, 6 J. FIN. ECON. 297, 299 (1978) (providing description of the monthly data used in an event study).

the invention of the PC, computing time and data storage became cheap, and daily data became available.[107]

In 1985, Brown and Warner again conducted another Monte Carlo study of event study methodology using daily data.[108] Using daily returns they again conclude, "methodologies based on the OLS market model and using standard parametric tests are well-specified under a variety of conditions."[109] Event study methodology has continued to flourish in the field of finance.[110]

Event studies are commonly presented as evidence in court.[111] "For over two decades, event studies have been prominently used as a valuation technique in various litigation matters including securities litigation. . . . In securities litigation, event study methodology has been widely used in fraud-on-the-market cases as economic evidence of materiality, loss causation, and artificial inflation."[112] In a two-part article published in 2002, Roberta Romano and Sanjay Bhagat conducted a comprehensive review of academic legal literature based on event studies.[113] The authors observed: "Event studies are among the most successful uses of econometrics in policy analysis."[114] They further observed that although event studies originated and became widely accepted in finance, they are now also widely used in policy analysis and particularly in the interaction between financial economics and law.[115]

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[107] *Cf.* Michael C. Lovell, *Data Mining*, 65 REV. ECON. & STAT. 1, 1 (1983) (stating that technological advances such as computers, databases, and automated software have reduced costs).

[108] Stephen J. Brown & Jerold B. Warner, *Using daily stock returns: The case of event studies*, 14 J. FIN. ECON. 3, 3 (1985) [hereinafter *Using daily stock returns*].

[109] *Id.* at 25.

[110] CAMPBELL ET AL., *supra* note 7, at 178 ("Perhaps the most successful applications [of event studies] have been in the area of corporate finance. Event studies dominate the empirical research in this area.").

[111] *See* Phillips v. Scientific-Atlanta, 489 F.App'x 339, 343 (11th Cir. 2012) ("Plaintiffs offered the expert report and deposition of Dr. Scott Hakala. Dr. Hakala's report included an 'event study' . . . ."); *see also* SEC v. Koenig, 557 F.3d 736, 743 (7th Cir. 2009) (describing how the SEC introduced an event study into evidence).

[112] Frank Torchio, *Proper Event Study Analysis in Securities Litigation*, 35 J. CORP. L. 159, 159 (2009).

[113] Bhagat & Romano, *supra* note 66, at 141.

[114] *Id.*

[115] *Id.* at 142 ("The event study methodology is well accepted and extensively used in finance. . . . Its use in policy analysis in recent years has become more widespread, and it is the interaction between law and financial econometrics that is the focus of this review.").

All of the statistical analysis for the current study was conducted through Wharton Research Data Services (WRDS). WRDS is the leading data research platform for conducting analysis of financial markets and is subscribed to by the top business schools in the world.[116] It provides an interface so that users can retrieve data without time-consuming computer programming by inputting the company identifiers and the dates to be analyzed.[117] After obtaining the federal court class action filing dates, complaint type, survived or dismissed classification, circuit, and industrial classification code from the Stanford SCAC, WRDS provides an interface that enables the researcher to match company names with numerical company identifiers, and then identify those firms for which the necessary stock market return data around the filing data is available. The stock market data comes from the University of Chicago's Center for Research in Security Prices (CRSP) data.[118] Finally, all of the event study analysis and statistics is conducted using a statistical software package called Eventus. "Eventus performs state-of-the-art event study estimation and testing using the CRSP stock database or other stock return data and provides fast event-oriented data retrieval from the CRSP stock database," and can be accessed through WRDS.[119]

All of the analysis was conducted using a standard event study with daily returns and employing the market model with the equal weighted stock index as the market portfolio. This methodology has been empirically shown to be robust and performs well in Monte Carlo simulations.[120] In event studies, time is measured relative to the event date.[121] Hence, the filing date is day zero, days before the filing date are negative, and days after the filing date are positive.[122] Days are measured in trading days.[123] Thus, day -10 represents two weeks before the event date, and day +10 is two weeks after the event date since the markets are

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[116] *About WRDS*, WHARTON RESEARCH DATA SERVICES, http://perma.cc/Z478-CGAV (last visited Feb. 12, 2014).

[117] *Id.* ("WRDS provides a state-of-the-art interface to a variety for databases, simplifying extracting and increasing productivity . . . .").

[118] *CRSP US Stock Databases*, *supra* note 99.

[119] EVENTUS, http://perma.cc/GFX6-P943 (last visited Feb. 12, 2014).

[120] *See Using daily stock returns*, *supra* note 108, at 25 ("[M]ethodologies based on the OLS market model and using standard parametric tests are well-specified under a variety of conditions.").

[121] Ball, *supra* note 96, at 38 (explaining the concept of event time).

[122] *See* ROSS ET AL., *supra* note 70, at 352 (providing an example).

[123] *See, e.g.*, CAMPBELL ET AL., *supra* note 7, at 153 (using "the 250-trading-day period prior to the event window as the estimation window").

closed on weekends.[124] The estimation period for estimating the parameters of the market model is 255 trading days (approximately one year) and ends at day -46 so that the actual event, and any anticipation of the event does not contaminate the estimation period for the parameters used to calculate abnormal returns.[125] If a company does not have return data for the entire estimation period, the model is still estimated, providing that there is a minimum of three data points.

A brief overview of the mechanics of the event study is provided herein. For each class action filing in the SCAC for which the required data is available in CRSP, the market model is constructed. The market model specifies the normal return of the security as a function of that security's alpha, plus the product of the firm's sensitivity to the market portfolio and the return on the market.[126] Thus, the normal return on a given day *t* for security *i* is:

$$(1) \qquad E(R_{i,t}) = \alpha_i + \beta_i R_{m,t},$$

where the parameters α and β are estimated from a regression of $R_{i,t}$ on $R_{m,t}$ during the estimation period using data from days -255 through -46.[127] Then for each day during the event period from days -30 to +30 and for each firm *i*, the abnormal returns are calculated as:

$$(2) \qquad A_{i,t} = R_{i,t} - E(R_{i,t}).$$[128]

In other words, the abnormal for firm *i* at time *t* is just the actual return less its expected return, and the expected return is based on the market model, which models the return of the firm as a function of the market

[124] *See* Romano, *Law as a Product, supra* note 8, at 271 n.64 (1985) (explaining that 20 trading days is equal to a calendar month).

[125] *See* Bhagat & Romano, *supra* note 66, at 146 (explaining that researchers normally estimate the statistical model using data from the period preceding the announcement window).

[126] *See* CAMPBELL ET AL., *supra* note 7, at 155 (equation 4.3.2).

[127] *Cf. id.* at 153 (similarly using 250 trading days in the period preceding the event window). I stop the estimation period at day -46 to reduce the possibility of anticipation of the event impacting the market model parameter estimates.

[128] *See* ROSS ET AL., *supra* note 70, at 351 (discussing calculation of the abnormal return).

portfolio return using the firm's specific parameters α and β.[129] This accounts for the firms' own risk and fluctuations in the overall market.[130]

Abnormal returns for individual securities are not analyzed because they are too volatile.[131] Rather, all firms in the sample are combined into a portfolio, and the abnormal returns for the portfolio for each day in the event window (-30 to +30) are calculated along with test statistics.[132] Cumulative abnormal returns (CAR) are also calculated with test statistics.[133] Although the individual company returns are too volatile to analyze, the central limit theorem guarantees that a portfolio of such returns will have a normal distribution with a standard deviation inversely proportional to the square root of the number of firms in the portfolio.[134] Thus, the portfolio abnormal returns have sufficient precision to analyze and detect systematic consequences associated with filing securities class action claims.

For each of the various event studies, I performed two different analyses. One is the analysis of daily abnormal returns from day -30 to day +30. In the interest of keeping the reported results such that the tables can fit easily on a printed page, I only report the daily abnormal returns from days -10 to +10. The second analysis examines cumulative abnormal returns, which accumulates abnormal returns over a window. Three windows are examined: (-30, -2); (-1, 0); and (+1, +30). For each abnormal return and cumulative average abnormal return (CAAR), a t-statistic is reported, which tests the null hypothesis that the returns are not statistically different from zero. Also, the number of observations used to calculate each test statistic is reported. The number of useable observations can change slightly over the period of analysis because some firms might have required data for some of the days in the period of analysis, but not for all of the days. The convention of examining the event window (-1, 0) is aptly explained by Professor Ross:

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[129] *Using daily stock returns*, *supra* note 108, at 7 (equation 4).

[130] *Measuring Security Price Performance*, *supra* note 95, at 213-14 (discussing risk and market adjusted returns and the use of the market model).

[131] *See* Bhagat & Romano, *supra* note 66, at 147 (explaining that individual abnormal returns are not analyzed due to their large standard errors).

[132] *See id.* (explaining how abnormal returns for a sample of firms are averaged in event time).

[133] *See generally* CAMPBELL ET AL., *supra* note 7, at 160-66 (explaining and illustrating with an example the use of cumulative abnormal returns).

[134] *See* FINKELSTEIN & LEVIN, *supra* note 13, at 114 (explaining that as a result of the central limit theorem, the standard error of an average of random variables will be normally distributed and proportional to $1/\sqrt{n}$).

> [T]he announcement date is generally taken in academic studies to be the publication date of the story in *The Wall Street Journal (WSJ)*. Then consider a company announcing a dividend omission [or the filing of a class action lawsuit] via a press release at noon on Tuesday. The stock should fall on Tuesday. The announcement will be reported in the *WSJ* on Wednesday, because the Tuesday edition of the *WSJ* has already been printed. For this firm, the stock price falls on the day before the announcement in the *WSJ*.
>
> Alternatively, imagine another firm announcing a dividend omission via a press release on Tuesday at 8 p.m. Since the stock market is closed at that late hour, the stock price will fall on Wednesday. Because the *WSJ* will report the announcement on Wednesday, the stock price falls on the day of the announcement in the *WSJ*.[135]

V. EMPIRICAL RESULTS & ANALYSIS

A. Baseline Study of all Firms

Table 2 reports the results from the baseline event study. This study uses all available observations on securities class action filings for which the required market data exists. There are a maximum of 845 filings in this analysis. The daily test statistics show a strong negative abnormal return that is significant at the one percent level every day from day -9 to day +1. There is one positive significant abnormal return on day +10, but analysis of the cumulative abnormal returns does not reveal a significantly positive abnormal return after the filing. Additionally, analysis of the cumulative average abnormal returns shows a strong negative cumulative abnormal return over the interval (-1, 0), as well as over the interval (-30, -2).

There are three conclusions that I drew from the baseline event study. The first conclusion is that the filing of a class action lawsuit results in a permanent drop in the value of the company. The second conclusion is that the valuation drop is completed very quickly after the filing occurs. The third conclusion is that there is some advance anticipation of class action filings in the stock market prior to the actual filing date.

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[135] ROSS ET AL., *supra* note 70, at 352 n.11.

TABLE 2
Filing Date Abnormal Returns for the Full Sample

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	845	-0.40%	-2.185**
-9	845	-0.52%	-2.878***
-8	845	-0.46%	-2.503***
-7	845	-0.50%	-2.768***
-6	845	-0.70%	-3.836***
-5	845	-0.44%	-2.441***
-4	845	-1.14%	-6.282***
-3	843	-0.85%	-4.667***
-2	842	-0.70%	-3.858***
-1	842	-1.41%	-7.729***
0	840	-0.61%	-3.350***
1	840	-0.90%	-4.918***
2	840	0.07%	0.386
3	840	-0.35%	-1.899**
4	838	-0.03%	-0.188
5	838	-0.33%	-1.794**
6	838	-0.05%	-0.255
7	838	0.16%	0.873
8	837	-0.01%	-0.079
9	833	0.20%	1.099
10	833	0.43%	2.387***

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	845	-9.97%	-10.234***
(-1,0)	842	-1.82%	-7.829***
(+1,+30)	842	0.58%	0.792

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

B. Filing Type—10(b) or Not

Tables 3 and 4 are designed to provide some insight as to whether the type of filing matters. By far the most prevalent filings involve claims under § 10(b).[136] Since § 10(b) is the general catch-all provision for fraud,[137] one might expect that actions involving such claims are likely to obtain larger damages than actions that are based on more narrow claims. Allegations of fraud are likely to damage a firm's reputation and valuation more severely than an allegation of breach of fiduciary duty or an omission in a registration statement. Additionally, claims that are based solely on violations of the '33 Act will tend to be against smaller corporations, and lead to smaller settlements. There are 723 observations on filings that involve § 10(b) and 122 observations on all other claim types. Since the number of observations for each of the other four claim types that were categorized is small, those filings were not further segregated by type of claim.

Table 3 displays the results of the event study on the § 10(b) filings and Table 4 displays the results for all others. The results support the conjecture that 10(b) claims will have a more adverse impact on valuation. Table 3 shows that firms that were sued under § 10(b) had large negative abnormal returns that are statistically significant at the one

[136] *See supra* Table 1 (showing that 723 of 845 observations involve a 10(b) claim).

[137] *See* Stephen J. Choi & Robert B. Thompson, *Securities Litigation and Its Lawyers: Changes During the First Decade after the PSLRA*, 106 COLUM. L. REV. 1489, 1492 n.12 (2006) ("In the case of secondary market fraud, suits are typically brought under Rule 10b-5, 17 C.F.R. § 240.10b-5 (2006), which was promulgated under § 10(b) of the Securities Exchange Act of 1934, 15 U.S.C. § 78j(b) (2000). In the case of fraud arising in a public offering, suits are brought under §§ 11 and 12(a)(2) of the Securities Act of 1933, 15 U.S.C. §§ 77k, 77l(a)(2), as well as under Rule 10b-5.").

percent level every day from days -10 to +1. The cumulative abnormal return for the six weeks leading up to the filing is nearly -13%, and exceeds -2% for the two-day window of (-1,0). Both are highly significant, and well beyond the one percent level.

Table 4 reveals that the other firms do not have statistically significant abnormal returns at or after the event date. Prior to the event date, the abnormal returns fluctuate between positive and negative, with the cumulative balance being positive. This indicates that these firms seem to experience a period of volatility in the stock market prior to the filing date.

TABLE 3
Filing Date Abnormal Returns for Filings Involving § 10(b)

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic

-10	722	-0.61%	-2.943***
-9	722	-0.65%	-3.122***
-8	721	-0.51%	-2.463***
-7	721	-0.62%	-2.981***
-6	721	-0.65%	-3.149***
-5	721	-0.64%	-3.067***
-4	721	-1.24%	-5.980***
-3	717	-0.81%	-3.908***
-2	716	-1.20%	-5.797***
-1	716	-1.78%	-8.567***
0	714	-0.63%	-3.034***
1	714	-0.84%	-4.055***
2	714	0.16%	0.765
3	714	-0.43%	-2.065**
4	712	0.03%	0.133
5	712	-0.19%	-0.928
6	713	-0.04%	-0.197
7	713	0.14%	0.652
8	713	0.06%	0.306
9	711	0.13%	0.644
10	711	0.41%	1.993**

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	723	-12.86%	-11.467***
(-1,0)	716	-2.19%	-8.117***
(+1,+30)	716	-0.40%	-1.138

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 4
Filing Date Abnormal Returns for Filings **NOT** Involving § 10(b)

Panel A. Daily Abnormal Returns

Event Date	N	abnormal	t-statistic

		return(%)	
-10	122	0.88%	2.04**
-9	122	0.16%	0.363
-8	122	-0.11%	-0.255
-7	122	0.20%	0.477
-6	122	-0.97%	-2.246**
-5	122	0.79%	1.84**
-4	122	-0.65%	-1.518*
-3	122	-1.15%	-2.68***
-2	122	2.12%	4.94***
-1	122	0.81%	1.889**
0	122	-0.52%	-1.212
1	122	-1.20%	-2.781***
2	122	-0.57%	-1.32*
3	122	0.13%	0.293
4	122	-0.38%	-0.874
5	122	-1.16%	-2.692***
6	121	-0.05%	-0.123
7	121	0.30%	0.694
8	120	-0.42%	-0.972
9	118	0.51%	1.178
10	118	0.67%	1.567*

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	122	6.35%	4.917***
(-1,0)	122	0.27%	0.794
(+1,+30)	122	1.26%	0.844

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

C. Filing Merits

Tables 5 and 6 are designed to address the question as to whether the market is able to distinguish between frivolous and merit-based class actions. Using dismissal of a claim as a proxy for frivolous behavior, the

sample is split between cases that were dismissed, and cases that either settled or otherwise survived (meaning that a settlement is almost certainly imminent). Obviously, the market cannot observe dismissal at the time of filing. However, if dismissal is a strong indication that the claim was frivolous when filed, there should be a weaker reaction to the filing if the market is able to detect the frivolousness of the complaint.

These results are very interesting. They indicate that even frivolous lawsuits result in a statistically significant drop in the value of the firm, but the magnitude of the drop is substantially larger for the filings that are not frivolous. This suggests that the market has a modest ability to discern meritorious filings from frivolous filings, but frivolous filings still damage firm value at a statistically significant level. We lack data on the average cost of defending a class action that is ultimately dismissed, so we cannot ascertain whether the drop is merely due to expected litigation costs or something more than that, which might include damage to the corporate reputation.

Table 5 reports the results for the filings that are not frivolous (not dismissed during the period of analysis). Every day during the window (-10, +1) the abnormal return is negative. Ten of the eleven days during the window (-9, +1), the negative abnormal returns are statistically significant at a conventional level, and eight of those ten are significant at the one percent level. The cumulative abnormal returns at the filing and preceding the filing are large (in absolute value) and highly significant. There is a small positive cumulative abnormal return in the thirty trading days following the filing, but it is not statistically significant, and it does not begin to make up for the large drop in value leading up to and including the filing. The cumulative abnormal return for window (-30, 0) is -13.6% whereas the cumulative abnormal return for window (+1, +30) is 0.78%.

Table 6 reports the abnormal and cumulative abnormal returns for the filings that were subsequently dismissed. Although still negative and significant, they are noticeably smaller. Additionally, there is no significant cumulative change in value during the period subsequent to filing. The negative abnormal return for these firms over the window (-30, 0) is -9.43%. This informs us that on average, the stock value for the merit-based filings dropped over 44% more than the value for the frivolous filings.[138]

TABLE 5
Filing Date Abnormal Returns for Filings which Survived

[138] 13.6/9.43=1.44.

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	502	-0.27%	-1.088
-9	502	-0.47%	-1.909**
-8	501	-0.34%	-1.403*
-7	501	-0.60%	-2.462***
-6	501	-1.04%	-4.254***
-5	501	-0.20%	-0.833
-4	501	-1.12%	-4.571***
-3	499	-1.08%	-4.382***
-2	498	-1.18%	-4.822***
-1	498	-1.70%	-6.934***
0	497	-0.97%	-3.941***
1	497	-1.02%	-4.145***
2	497	0.20%	0.832
3	497	-0.25%	-1.016
4	495	-0.10%	-0.424
5	495	-0.25%	-1.014
6	495	0.21%	0.859
7	495	0.39%	1.604*
8	495	0.21%	0.84
9	492	0.22%	0.904
10	492	0.06%	0.248

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	502	-11.04%	-15.574***
(-1,0)	498	-2.56%	-13.817***
(+1,+30)	498	0.78%	1.063

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 6
Filing Date Abnormal Returns for Filings which Were Dismissed

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	342	-0.58%	-2.269**
-9	342	-0.62%	-2.423***
-8	342	-0.61%	-2.378***
-7	342	-0.34%	-1.34*
-6	342	-0.19%	-0.745
-5	342	-0.76%	-2.952***
-4	342	-1.20%	-4.679***
-3	340	-0.54%	-2.114**
-2	340	-0.04%	-0.139
-1	340	-0.96%	-3.72***
0	339	-0.09%	-0.366
1	339	-0.71%	-2.759***
2	339	-0.17%	-0.659
3	339	-0.49%	-1.91**
4	339	0.08%	0.292
5	339	-0.46%	-1.778**
6	339	-0.41%	-1.605*
7	339	-0.18%	-0.717
8	338	-0.32%	-1.23
9	337	0.14%	0.525
10	337	1.02%	3.962***

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	343	-8.56%	-11.486***
(-1,0)	340	-0.87%	-4.472***
(+1,+30)	340	0.18%	0.238

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

D. Circuit Court

Tables 7-9 are designed to address whether the stock market reactions are different depending on where the claims are filed. One might expect the market to react differently to claims filed in different geographic areas because some circuits are more or less hostile to securities class action claims.[139] However, we have to be extremely careful not to draw causal inferences from these results.[140] There are too many factors at play that cannot be adequately controlled for.

For example, results could differ in one circuit because the most dominant law practices in securities class actions are housed in that circuit. For now, we will be content with merely uncovering the stylized facts as to whether there are differences. Since the Ninth Circuit and the Second Circuit are the two circuits with the greatest number of class action filings,[141] we examine those two separately and combine all the others into a residual category of all other circuits. The main conclusion from this analysis is that filings in the Ninth Circuit lead to valuation drops that are more than double those for filings in the Second Circuit.

Table 7 examines 189 filings in the Ninth Circuit. Every daily abnormal return from days -10 to +1 is negative and significant at the 5% level or better. More informative are the cumulative abnormal returns, which are all negative and statistically significant, even for the post event window. Stocks incur a cumulative -12.95% abnormal return during window (-30, -2); -2.74% during window (-1, 0); and -2.21% during window (+1, +30). The fact that firms that have securities class actions filed against them in the Ninth Circuit continue to experience negative abnormal returns after the filing date is interesting in itself, and suggests that shorting these companies as soon as the filings occur could be modestly profitable.[142]

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[139] *See*, *e.g.*, Marc I. Steinberg & Dustin L. Appel, *A Prolonged Slump for "Plaintiff-Pitchers": The Narrow "Strike Zone" for Securities Plaintiffs in the Fourth Circuit*, 88 N.C. L. REV. 1923, 1978 (2010) (asserting that the Fourth Circuit has been more hostile to securities fraud cases than other circuits).

[140] *See* THOMAS H. WONNACOTT & RONALD J. WONNACOTT, REGRESSION: A SECOND COURSE IN STATISTICS 173 (reprinted, 1987) ("Even though correlation or regression may have established that two variables move together, no claim can be made that this necessarily indicates cause and effect.").

[141] *See supra* Table 1 (showing that more than fifty percent of the filings came from the Second and Ninth Circuits).

[142] *See* ROSS ET AL., *supra* note 70, at 343 ("If the price of the stock takes several days to adjust, trading profits would be available to investors . . . .").

Table 8 examines 312 filings in the Second Circuit. The daily abnormal returns have fewer significant values at lower levels of significance and are more erratic. The cumulative abnormal returns indicate no statistically significant abnormality in the event window (-1, 0) or the post event window (+1, +30). There is a statistically significant negative abnormal return in the pre-event window (-30, -2), indicating some market anticipation of filings in the Second Circuit. The magnitude of that reaction however, is -6%, which is large, but less than half the magnitude for Ninth Circuit filings.[143]

Table 9 reports the results of analysis of 344 filings in all other circuits combined. Every daily abnormal return from day -10 to day +1 is negative, and eleven of the twelve are statistically significant. The cumulative abnormal returns for the pre-event, event, and post-event windows are -11.77%, -2.69%, and +1.68%, respectively, and all are statistically significant. The magnitudes for the pre-event and event windows are very close to the values for the Ninth Circuit, but the performance in the post-event window is markedly different. It appears that the Ninth Circuit is special in that firms continue to underperform the market for weeks after filing, and the Second Circuit is special in that the pre-event abnormal performance is markedly smaller, and the actual filing event has no statistically discernible effect.

TABLE 7
Filing Date Abnormal Returns for Filings in the Ninth Circuit

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	189	-0.73%	-2.161**
-9	189	-1.32%	-3.919***
-8	188	-1.45%	-4.308***
-7	188	-1.64%	-4.864***
-6	188	-1.30%	-3.85***
-5	188	-0.70%	-2.073**
-4	188	-1.29%	-3.837***
-3	187	-1.73%	-5.135***
-2	186	-1.49%	-4.411***

[143] Compare *infra* Table 7 with *infra* Table 8, which shows that Panel B CAARs for windows (-30, -2) are -12.95% and -6%, respectively.

-1	186	-1.77%	-5.256***
0	186	-1.26%	-3.748***
1	186	-1.19%	-3.542***
2	186	0.35%	1.03
3	186	-0.57%	-1.689**
4	185	0.07%	0.196
5	185	-0.19%	-0.551
6	186	0.02%	0.048
7	186	-0.30%	-0.886
8	185	0.19%	0.55
9	182	-0.33%	-0.989
10	182	0.27%	0.801

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t statistic
(-30,-2)	189	-12.95%	-10.470***
(-1,0)	186	-2.74%	-8.528***
(+1,+30)	187	-2.21%	-1.768**

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 8
Filing Date Abnormal Returns for Filings win the Second Circuit

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	311	0.03%	0.078
-9	311	-0.13%	-0.38
-8	311	-0.03%	-0.078
-7	311	0.06%	0.167
-6	311	-0.59%	-1.756**
-5	311	0.08%	0.226
-4	311	-0.64%	-1.912**
-3	311	-0.77%	-2.319**
-2	311	-0.45%	-1.35*
-1	311	-0.80%	-2.388***
0	310	0.52%	1.564*
1	310	-0.77%	-2.294**
2	310	0.16%	0.486
3	310	-0.20%	-0.605
4	309	-0.11%	-0.341
5	309	-0.46%	-1.382*
6	309	-0.05%	-0.143*
7	309	0.51%	1.522
8	309	-0.18%	-0.525
9	308	0.56%	1.672
10	308	0.63%	1.881**

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	312	-6.00%	-6.853***
(-1,0)	311	-0.22%	-0.950
(+1,+30)	310	0.50%	0.566

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 9
Filing Date Abnormal Returns for Filings in All Other Circuits

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	344	-0.59%	-2.467***
-9	344	-0.46%	-1.924**
-8	344	-0.29%	-1.214
-7	344	-0.38%	-1.568*
-6	344	-0.47%	-1.961**
-5	344	-0.74%	-3.071***
-4	344	-1.55%	-6.43***
-3	341	-0.46%	-1.915**
-2	341	-0.54%	-2.254**
-1	341	-1.75%	-7.259***
0	340	-1.29%	-5.375***
1	340	-0.84%	-3.506***
2	340	-0.21%	-0.866
3	340	-0.36%	-1.49*
4	340	-0.01%	-0.039
5	340	-0.30%	-1.237
6	339	-0.07%	-0.292
7	339	0.09%	0.379
8	339	0.04%	0.184
9	339	0.13%	0.532
10	339	0.39%	1.603*

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	344	-11.77%	-16.000***
(-1,0)	341	-2.69%	-13.990***
(+1,+30)	341	1.68%	2.253**

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

E. Economic Sector

Tables 10-14 break the filings down into different economic sectors. There are important differences between the sectors that affect the market's ability to value them.[144] Manufacturing, agriculture, and natural resources such as timber involve buildings, machines, and land, which are somewhat easier to see and value than assets in other sectors.[145] The value of service companies depends in large part on their customer base and customer loyalty, which are more difficult to assess.[146] Transportation services are closely linked to the price of oil, and hence subject to more than average volatility.[147]

Table 10 displays results for all economic sectors that do not involve services. This includes retail, manufacturing, agriculture, and natural resource intensive industries.[148] The daily abnormal returns are both negative and statistically significant for days -9 through +1. The cumulative abnormal returns for both the event window and pre-event window are large, and highly significant. After comparison with the tables for the service sectors, it is clear that the negative reaction to securities class action filings is larger in the non-service sector. There is no obvious reason provided by economic theory as to why this should be the case. One conjecture might be that fraud in the service sector tends to involve fictitious arms-length contracts or customers, whereas fraud in the non-service sector might tend to involve concealment of liability for dangerous products. The latter is potentially more damaging to a corporation. A comprehensive analysis of this reasoning would require reading hundreds of pleadings and attempting to catalog the principal basis for the claims.

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[144] *See* Mark Klock & Katherine I. Gleason, *Intangible Capital in the Pharmaceutical and Chemical Industry*, 46 Q. REV. ECON. & FIN. 300, 301-02 (2006) (explaining that sources of intangible vary by industry and affect firm value).

[145] *See* Robert Hall, *Struggling to Understand the Stock Market*, 91 AM. ECON. REV. 1, 5-6 (2001) (explaining that variations in value across industries occur as a result of differences in real stuff and differences in intangibles).

[146] *See, e.g.*, *id.* at 2 (noting the difficulty in placing a value on Yahoo).

[147] *See* Michael S. Haigh & David A. Bessler, *Causality and Price Discovery: An Application of Directed Acyclic Graphs,* 77 J. BUS. 1099, 1099 (2004) (taking notice of "the fact that freight rates are notoriously volatile").

[148] *Division of Corporation Finance: Standard Industrial Classifications (SIC) Code List*, U.S. SEC. & EXCHANGE COMMISSION, http://perma.cc/YD8V-9CD7 (last visited Feb. 12, 2014) (The codes of interest are codes 10-39 and 50-59 at the two-digit level).

TABLE 10
Filing Date Abnormal Returns for Filings in Non-Services
(retail, manufacturing, agricultural & resource intensive; SIC 01-39 & 50-59)

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	399	-0.12%	-0.501
-9	399	-0.44%	-1.814**
-8	399	-0.36%	-1.461*
-7	399	-0.61%	-2.509***
-6	399	-1.23%	-5.058***
-5	399	-0.45%	-1.834**
-4	399	-1.41%	-5.786***
-3	398	-1.46%	-6.002***
-2	397	-0.79%	-3.245***
-1	397	-1.85%	-7.606***
0	397	-0.47%	-1.938**
1	397	-1.15%	-4.704***
2	397	0.38%	1.556*
3	397	-0.15%	-0.62
4	396	0.21%	0.872
5	396	-0.22%	-0.898
6	396	0.12%	0.482
7	396	0.01%	0.026
8	396	0.01%	0.03
9	393	-0.03%	-0.105
10	393	0.28%	1.158

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	400	-11.68%	-14.806***
(-1,0)	397	-1.89%	-9.160***
(+1,+30)	397	0.82%	1.018

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

Table 11 displays results for all services, including financial services, transportation services, and communication services. The service sector is slightly larger than non-services, but not that far from a fifty-fifty split (53% to 47%).[149] The service sector continues to display negative and generally significant abnormal returns before and immediately around the event, but the cumulative abnormal return for the pre-event window is noticeably smaller than for the non-service sector, which indicates these firms do not lose as much of their value after adjusting for market fluctuations.

TABLE 11
Filing Date Abnormal Returns for Filings in All Services
(transportation, communication, financial, & services; SIC 40-49 & 60-89)

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	445	-0.64%	-2.533***
-9	445	-0.61%	-2.419***
-8	444	-0.54%	-2.134**
-7	444	-0.40%	-1.575*
-6	444	-0.22%	-0.862
-5	444	-0.41%	-1.637*
-4	444	-0.93%	-3.664***
-3	441	-0.32%	-1.25
-2	441	-0.65%	-2.582***
-1	441	-0.99%	-3.921***
0	439	-0.74%	-2.931***
1	439	-0.66%	-2.624***
2	439	-0.24%	-0.961
3	439	-0.53%	-2.078**
4	438	-0.25%	-0.996
5	438	-0.44%	-1.731**
6	438	-0.19%	-0.741

[149] *See supra* Table 1 (comparing 445 out of 845 with 400 out of 845).

7	438	0.30%	1.174
8	437	-0.02%	-0.071
9	436	0.38%	1.496*
10	436	0.60%	2.382***

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	445	-8.53%	-12.588***
(-1,0)	441	-1.75%	-9.922***
(+1,+30)	441	0.26%	0.368

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

Tables 12-14 display results for various components of the service sector. Table 12 shows results for financial services alone. Again, this sector shows generally negative and significant abnormal returns before and around the filing. The cumulative abnormal returns for the event and pre-event windows are highly significant. They are also larger (in absolute value) than that of other service sectors, but smaller than for non-services. The finding that the market reacts more negatively to fraud in the financial sector than in other service areas is in accordance with conventional wisdom that fraud by financial intermediaries is especially troublesome.[150]

[150] *See, e.g.*, L. Randall Wray, *Global Financial Crisis: Causes, Bail-Out, Future Draft*, 80 UMKC L. REV. 1101, 1109 (2012) ("It would not be too extreme to say that fraud has become normal business practice in the financial sector.").

TABLE 12
Filing Date Abnormal Returns for Filings in Financial Services
(SIC 60-69)

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	162	-0.74%	-2.321**
-9	162	0.03%	0.104
-8	162	-1.05%	-3.305***
-7	162	-0.67%	-2.086**
-6	162	0.42%	1.331*
-5	162	-0.94%	-2.958***
-4	162	-1.08%	-3.4***
-3	162	-0.07%	-0.233
-2	162	-1.62%	-5.083***
-1	162	-0.66%	-2.083**
0	161	-1.04%	-3.257***
1	161	-0.97%	-3.032***
2	161	-0.48%	-1.497*
3	161	-0.91%	-2.869***
4	161	-0.41%	-1.276
5	161	-0.73%	-2.288**
6	160	-0.27%	-0.86
7	160	0.14%	0.443
8	160	-0.47%	-1.481*
9	160	0.36%	1.14
10	160	0.02%	0.073

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	162	-9.27%	-10.884***
(-1,0)	162	-1.77%	-7.918***
(+1,+30)	161	0.34%	0.372

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The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

Table 13 provides results for the service sector defined as SIC codes 7000 and up. This category excludes transportation and communications services, as well as the financial sector. Again, the results reveal several negative and significant abnormal returns before the filing, and a negative and significant abnormal return on the filing date. The cumulative abnormal returns for the event window and pre-event window are negative and highly significant, but the total cumulative negative abnormal return over these windows is smaller than for any other sector.

Transportation and communications services as defined by SIC two-digit codes between 40 and 49 have the smallest number of observations with just 77. Rather than run the analysis on the small subsample, Table 14 reports the analysis for all services excluding transportation and communication services. These are defined by SIC two-digit codes above 60.[151] Again, we observe generally negative and significant daily abnormal returns in the event and pre-event windows, and highly significant negative cumulative abnormal returns over this period. The fact that the cumulative abnormal returns in Table 14—which excludes transportation and communications—are smaller than those in Table 11—which includes them—indicates that transportation and communications firms, like financial firms, react stronger to class action filings than other types of service firms.

TABLE 13
Filing Date Abnormal Returns for Filings in Services
(excludes transportation, communications and finance; includes SIC 70-89)

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	206	-0.65%	-1.602*
-9	206	-0.61%	-1.497*
-8	205	-0.44%	-1.072
-7	205	0.03%	0.073
-6	205	-0.29%	-0.711
-5	205	0.31%	0.759

[151] *See generally Standard Industrial Classifications (SIC) Code List*, *supra* note 148.

-4	205	-0.99%	-2.417***
-3	205	-0.60%	-1.475*
-2	205	0.15%	0.357
-1	205	-1.58%	-3.865***
0	204	-0.77%	-1.892**
1	204	-0.33%	-0.81
2	204	0.00%	-0.005
3	204	-0.37%	-0.917
4	204	-0.08%	-0.185
5	204	0.00%	0.001
6	205	-0.15%	-0.367
7	205	0.37%	0.911
8	204	0.24%	0.596
9	203	0.22%	0.551
10	203	0.95%	2.314**

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	206	-5.56%	-4.184***
(-1,0)	205	-2.12%	-6.108***
(+1,+30)	206	0.02%	0.005

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 14

Filing Date Abnormal Returns for Filings in Finance & Services (excludes transportation & communication services; includes SIC 60-89)

Panel A. Daily Abnormal Returns

Event Date	N	abnormal return(%)	t-statistic
-10	368	-0.69%	-2.499***
-9	368	-0.33%	-1.183

-8	367	-0.71%	-2.563***
-7	367	-0.28%	-1.0
-6	367	0.03%	0.091
-5	367	-0.24%	-0.878
-4	367	-1.03%	-3.718***
-3	367	-0.37%	-1.334*
-2	367	-0.63%	-2.289**
-1	367	-1.17%	-4.241***
0	365	-0.89%	-3.213***
1	365	-0.61%	-2.207**
2	365	-0.21%	-0.764
3	365	-0.61%	-2.212**
4	365	-0.22%	-0.801
5	365	-0.32%	-1.161
6	365	-0.20%	-0.738
7	365	0.27%	0.978
8	364	-0.07%	-0.257
9	363	0.29%	1.033
10	363	0.54%	1.945**

Panel B. Cumulative Abnormal Returns

Days	N	CAAR	t-statistic
(-30,-2)	368	-7.72%	-10.356***
(-1,0)	367	-1.92%	-9.828***
(+1,+30)	367	0.20%	0.253

The symbols *, **, and *** denote statistical significance for a one-tail test at the 0.10, 0.05, and 0.01 levels, respectively.

VI. CONCLUSIONS

This study has endeavored to conduct and document a replicable event study on securities class action filings subsequent to the PSLRA using the largest available set of data. A large data set provides the most

power in test statistics, meaning that we are less likely to accept a null hypothesis of no impact when in fact the event does have an impact on the value of the companies' stocks.[152] We do find that, overall, all securities class action filings have a negative impact at the filing date, and there is a statistically significant decline in value before filing occurs. This suggests that the market partially anticipates the filing of securities class actions. We also find in the baseline case that the full drop in valuation because of the class action is completed one day after the filing, and the market does not over-react because there is no subsequent statistically significant bounce back towards prior valuation.

Interestingly, the greatest decline in stock value occurs for firms that have a 10(b) claim against them. Other types of claims that are not coupled with a 10(b) claim do not result in as large of drops. Also noteworthy is the fact that frivolous suits, defined as those that are subsequently dismissed on motion, also cause a statistically significant drop in value, but not as large as merit-based suits. This might suggest that the market has some ability to distinguish between frivolous and non-frivolous suits, but even frivolous suits are costly to corporate value.

We also note that the circuit filed where the complaint is filed is correlates with the valuation change. Filings in the Ninth Circuit have a valuation drop that is much larger than those in the Second Circuit, and suffer some persistence in a continued valuation drop weeks after the filing. The economic sector also makes a difference to the magnitude of the valuation drop. Non-service firms lose more value than service firms. Within service firms, financial firms lose most. Excluding financial service firms, transportation and communications service firms lose more value than other types of service firms.

Securities class action lawsuits provide benefits in the form of deterring fraud, redressing fraud, and promoting investor confidence in the market.[153] They also come with costs associated with attracting nuisance suits, which damage value either through resource expenditures or damage to corporate reputation.[154] An optimal level of class action filings would result in marginal costs that equal the marginal savings.[155]

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[152] *See* Bhagat & Romano, *supra* note 66, at 149 ("[T]he power of the event study diminishes as the sample size decreases.").

[153] *See* Stout, *supra* note 42, at 714-15 (discussing how private plaintiffs' lawyers produce value through a reduction in fraud).

[154] *See id.* (mentioning the costs of strike suits related to securities fraud).

[155] *See* Mark Klock, *Two Possible Answers to the Enron Experience: Will It Be Regulation of Fortune Tellers or Rebirth of Secondary Liability*, 28 J. CORP. L. 69, 101 (2002) ("Only optimal regulation provides solutions to real market

Whether the total costs exceed the total benefits is a topic that will surely continue to be debated, but it is clear from the data that the magnitude of both costs and benefits is non-trivial.

failures. Like any optimization problem, the solution is likely to involve a balancing of marginal resources against marginal benefits.").