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DISCLOSURE VERSUS PUBLIC ENFORCEMENT AND THE OPTIMAL DESIGN OF SECURITIES REGULATION

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Abstract

Investment funds now oversee more than $66 trillion, giving their managers wide discretion over an increasingly significant share of Americans' wealth and leading to concerns of potentially severe agency problems between fund managers and investors. But there is limited academic research on these funds, and challenges such as data limitations make it difficult to estimate—or even identify—agency problems. Nonetheless, faced with rapid growth at investment funds, policymakers have made a series of regulatory changes in this area that have included mandatory disclosure rules and increased enforcement. This regulatory strategy presents a further challenge for empirical analysis in this area: because changes in the laws of disclosure and enforcement usually occurred simultaneously, it is difficult to disentangle the effects of each.

Using a unique quasi-experimental setting, I attempt to address these challenges and provide initial evidence on the separate effects of disclosure and enforcement on agency costs at a subset of investment funds: hedge funds. My findings provide preliminary evidence that mandatory regulation has reduced agency problems at hedge funds—and that changes to the law of disclosure have driven this effect. My inquiry provides a first step in understanding optimal regulation for these understudied, and increasingly important, financial entities.

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INTRODUCTION

Firms that provide investment management and advice—known in securities law parlance as investment advisors—oversee the deployment of more than $66 trillion of wealth.[1] To provide context for this figure, it is more than twice the market capitalization of the New York Stock Exchange and NASDAQ—combined.[2] The growing economic importance of these entities has led to increased concern that there may be costly agency problems at investment funds, because the interests of a fund's managers and its investors are unlikely to be perfectly aligned. The lack of transparency at many funds has made this issue all the more pressing. Facing increasing concern regarding these entities—and despite limited academic research to guide regulatory policy in this context—policymakers have made significant recent changes to the regulatory regime for investment funds.[3] These changes have resulted in an increase in publicly available information, but the funds are still far more opaque than many other entities. The limited amount of public information makes it difficult to study whether the recent wave of regulation has achieved its goal of reducing agency problems—or even to identify such problems.

In the absence of hard evidence on the relationship between regulation and agency costs in this context, there has been an increasingly vigorous theoretical debate over whether and how the law should continue to address these costs. Some have contended that the law should focus on mandating disclosure because investors, when they have the information they need, are best situated to protect themselves. Others have argued that

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[1] Investment advisors regulated by the Securities and Exchange Commission ("SEC") oversee more than $66.9 trillion in assets. *See* Historical Archive of Investment Adviser Reports (June 2015), SEC [hereinafter Archive].

[2] *See* Sophia Yan, *China's Stock Market is Now Worth over $10 Trillion*, CNN MONEY (June 15, 2015). NYSE's market capitalization is roughly $20 trillion, and NASDAQ's market capitalization is roughly $7 trillion.

[3] *See supra* Part II.A. for a summary of changes in the regulation of investment advisors.

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regulators should emphasize enforcement of managers' duties to their investors. And many others point out that disclosure and enforcement are likely to be more effective together than either would be separately—a viewpoint that regulators appear to have adopted, as the current regulatory regime includes a combination of both enforcement and disclosure rules. Although the use of both factors together may be optimal, their joinder makes it difficult for researchers to separate the effects of each factor and presents a further challenge for empirical research on the regulation of investment funds—even assuming that we could identify agency costs at these funds, it would be difficult to determine what regulatory component, if any, reduced these costs.

This Article takes a preliminary step towards addressing these challenges by exploiting a natural experiment that caused a particularly important subset of investment funds—hedge funds[4]—to be regulated, deregulated, and then regulated again.[5] I provide initial evidence that regulation reduced agency costs at hedge funds and that the decrease was driven by disclosure rules. However, while my unique setting allows me to overcome the obstacle of disentangling disclosure and enforcement, many challenges remain. In particular, agency costs at investment advisors are poorly defined and difficult to identify, a challenge made all the more imposing by severe data limitations and limited prior academic research in this area. Although extensive prior academic work has considered agency

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[4] Hedge funds were once considered to cater solely to wealthy individuals, but the majority of hedge funds' investors are now institutional investors such as pensions and universities—individuals only account for an estimated 3.6% of total capital. *New MFA Infographic Highlights Diverse Hedge Fund Investor Base,* Managed Funds Association (Sept. 10, 2014). Growth in these funds has outpaced growth of investment funds overall.

[5] The changes in law were generated by agencies, the courts, and Congress. It should be noted that the changes applied to the funds' advisors, not the actual funds. In my hedge fund setting, however, the fund and its advisor are substantively the same entity: there is usually one advisor per fund and individuals are common to both entities. For ease of exposition, I state in this Article that the changes in law applied to the funds.

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costs and optimal regulatory design in the public-company context, agency costs at investment funds have received scant attention.[6] Due to these challenges, I instead study a *symptom* of agency costs: misreporting of financial performance. To be sure, misreporting is an imperfect proxy for the full spectrum of agency costs,[7] but the lack of a better option is reflective of the limited empirical research in this area.

My empirical inquiry yields three tentative conclusions. First, my evidence indicates that recent changes to the law have meaningfully reduced agency costs at hedge funds, notwithstanding widespread public concern about their efficacy.[8] Second, my results provide preliminary evidence that these effects are driven by changes to the law of disclosure rather than enforcement. Finally, although more research is needed before generalizing my findings to public companies,[9] my results contribute to the debate over whether public company investors would benefit from a greater regulatory focus on disclosure rather than enforcement.

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[6] The relative dearth of empirical work on investment advisors is striking given that regulators have long questioned whether lessons from public corporations should be applied to these advisors. For example, Alan Greenspan has argued that hedge fund regulation may not be effective because funds are more mobile than public companies and can relocate to avoid regulation. *See Private-Sector Refinancing of the Large Hedge Fund, Long-Term Capital Management Before the H. Comm. on Banking & Fin. Servs.*, 105th Cong. (1998). I consider the differences between hedge fund investors and public company shareholders in more detail below. *See infra* Part III.C.

[7] The intuition for this proxy and measures of misreporting are described *infra* Part I.D.

[8] *Compare* Greenspan, *supra* note 6 ("It is questionable whether hedge funds can be effectively regulated in the United States alone.") *with* Harvey Goldschmid, Commissioner, SEC, Colum. Bus. Sch., Center on Japanese Economy and Business, *Program on Alternative Investments: Should Hedge Funds be Regulated?* 6 (Nov. 17, 2004) (the requirements of regulation "bring about accountability and deterrence" and "will deter fraudsters from entering the business") [hereinafter CBS].

[9] *See infra* Part III.C. for a discussion of the concerns in applying empirical results from the context of hedge funds can be applied to public companies.

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The remainder of the Article proceeds as follows. Part I describes how securities law addresses agency costs—and how those costs might manifest themselves at investment advisors. Part II empirically examines the effects of hedge fund regulation. Part III offers implications for lawmakers and commentators. Part IV concludes.

I. SECURITIES REGULATION AND AGENCY COSTS

Much of corporate and securities law is focused on the classic problem that arises when a principal hires an agent to make decisions on the principal's behalf.[10] Most scholarship in this area examines that problem in publicly traded corporations, where the board of directors is charged with making decisions on behalf of shareholders.[11] More recently, however, scholars have turned their attention to the agency problem at investment advisors—that is, the risk that investment managers will pursue their own interests at the expense of investors.[12]

In the context of investment advisors, the law attempts to minimize agency costs in two primary ways. First, the law mandates disclosure, giving the principals (the investors) a low-cost mechanism to monitor their agents (the investment managers). Second, the law gives interested parties, such as government officials, authority to pursue enforcement actions

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[10] Federal securities laws have long sought to minimize agency costs. *See* H.R. REP. NO. 73-1383, pt. 2, at 5 (1934) ("As a complex society so diffuses . . . the financial interests of the ordinary citizen that he . . . cannot personally watch the managers of all his interests . . . it becomes a condition of the very stability of that society that its rules of law . . . protect that ordinary citizen's dependent position.").

[11] *See generally* DEL. CODE ANN. TIT. 8, § 141(a) (1993).

[12] *See, e.g.*, Ronald J. Gilson & Jeffrey N. Gordon, *The Agency Costs of Agency Capitalism: Activist Investors and the Reevaluation of Governance Rights*, 113 COLUM. L. REV. 863 (2013).

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against investment managers, reducing managers' incentives to pursue their own interests at investors' expense.

A. Mandatory Disclosure and Agency Costs

Mandatory disclosure rules are the cornerstone of U.S. securities law. Although scholars have offered a wide range of justifications for such rules, Paul Mahoney has powerfully argued that these rules can be justified as a low-cost mechanism to reduce agency costs at public companies.[13] Whatever one thinks of this argument, the insight has had considerable influence on modern securities law. For example, mandatory disclosure rules related to executive pay are designed to address the well-known agency problems that arise in that context.[14]

Mandatory disclosure rules can reduce agency costs in two ways. First, managers may alter their behavior *ex ante* because they anticipate investors will react negatively to their decisions.[15] Second, *ex post*,

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[13] *See* Paul G. Mahoney, *Mandatory Disclosure as a Solution to Agency Problems*, 62 U. CHI. L. REV. 1047, 1051 (1995); *see also* John Armour et al., *Agency Problems, Legal Strategies, and Enforcement*, in THE ANATOMY OF CORPORATE LAW: A COMPARATIVE AND FUNCTIONAL APPROACH 35 (Reinier Kraakman et al. eds., 2009). Of course, this is only one of many justifications for mandatory disclosure. For the seminal analysis of the theory of mandatory disclosure, *see* John C. Coffee, Jr., *Market Failure and the Economic Case for a Mandatory Disclosure System,* 70 VA. L. REV. 717 (1984).

[14] For a review of the literature on potential agency costs related to executive pay, *see, e.g.*, Robert J. Jackson, Jr. & Colleen Honigsberg, 100 VA. L. REV., 479, 483-85 (2014); *see also generally* Lucian Bebchuk et al., *Managerial Power and Rent Extraction in the Design of Executive Compensation*, 69 U. CHI. L. REV. 751, 762 (2002).

[15] Disclosure alone, even without complementary enforcement, may cause changes in behavior. *See, e.g.*, MELVIN EISENBERG, THE STRUCTURE OF THE CORPORATION 35 (1976) ("Even a naked requirement of disclosure is efficacious: many men will not do publicly what they would do privately.") Empirical literature supports this proposition. For example, the finance literature has shown that the requirement in the Sarbanes-Oxley Act, 15 U.S.C. § 7201 *et. seq.*, that public companies disclose whether a "financial expert" sits on the company's audit committee led to a doubling of the number of those

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disclosure gives investors information about the firm's governance that they can use to demand change or exit their investment.[16] A large body of literature has considered whether these benefits of mandatory disclosure rules are likely to outweigh their costs for publicly traded corporations, although less attention has been given to the effects of such rules for investment advisors.[17]

B. Enforcement and Agency Costs

In addition to mandatory disclosure rules, corporate and securities law seeks to reduce agency costs through enforcement of agents' legal obligations to their principals. Increased enforcement is thought to deter wrongdoing by increasing the expected cost of a wrongful action.[18] The increased cost correspondingly lowers the net benefit of the action for the prospective actor, making the agent less likely to commit the act in question.

Previous work has emphasized both public and private sources of enforcement. In the public-company context, the law gives the government (and, in particular, the SEC) authority to pursue public

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"experts" on audit committees. *See* James Linck et al., *The Effects and Unintended Consequences of the Sarbanes-Oxley Act on the Supply and Demand for Directors,* 22 REV. FIN. STUD. 3287, 3323 (2009).

[16] Under this approach, disclosure enhances the effectiveness of private enforcement. For one such example, recent work provides evidence that public-company directors altered executive pay arrangements following the mandatory disclosure and shareholder-vote requirements imposed by the Dodd-Frank Act, Pub. L. No. 111-201, 124 Stat. 1376 (2010) ("DFA"). *See* Yonca Ertimur, Fabrizio Ferri, & David Oesch, *Shareholder Votes and Proxy Advisors: Evidence from Say on Pay*, 51 J. ACCT. RES. 951 (2013).

[17] For an early exception, *see, e.g.,* Qi Chen, Itay Goldstein, & Wei Jiang, *Directors' Ownership in the U.S. Mutual Fund Industry,* 63 J. FIN. 2629 (2008).

[18] For the seminal work in this area, *see* Gary Becker, *Crime and Punishment: An Economic Approach,* 76 J. POL. ECON. 169 (1968).

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enforcement—that is, to conduct examinations and bring enforcement actions for violations of directors' duties—and private attorneys are, with important limitations, permitted to pursue private enforcement by suing directors on shareholders' behalf.[19] Managers at investment advisors face similar sources of enforcement to their public-company counterparts. The law authorizes the SEC and other government entities, as well as private investors and their representatives,[20] to bring suit against these managers.[21] However, although private investors may bring any number of claims against investment advisors, such litigation occurs far less frequently than comparable private litigation at public companies.[22]

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[19] *See, e.g.*, Armour, *supra* note 13, at 46-49. Gatekeepers, such as auditors, who align the interests of agents with their principals *ex ante* by increasing the likelihood that violations of the agent's obligations will be detected also play a significant role in enforcement. Whether the deterrence benefits of public and private enforcement outweigh their costs for public-company investors has been a source of considerable controversy. In theory, shareholder litigation can raise or lower corporate value. *See* Reinier Kraakman et al., *When Are Shareholder Suits in Shareholder Interests?*, 82 GEO. L.J. 1733 (1994). In practice, however, many argue that this mechanism is not efficient. *See, e.g.,* John C. Coffee, Jr., *The Regulation of Entrepreneurial Litigation: Balancing Fairness and Efficiency in the Large Class Action*, 54 U. CHI. L. REV. 877 (1987).

[20] In addition to private litigation, investors can also exit their investment. For an especially insightful discussion of exit rights in the context of mutual funds, *see* John Morley & Quinn Curtis, *Taking Exit Rights Seriously: Why Governance and Fee Litigation Don't Work in Mutual Funds*, 120 YALE L. J. 84 (2010) (arguing that, in the case of mutual funds, investors lack meaningful incentives to pursue changes in governance because the contractual structure of open-ended mutual funds makes exit a lower-cost, and therefore more appealing, alternative).

[21] Of course, disclosure mandates and enforcement activity have a complementary effect: the disclosed information, once revealed, may lead to an enforcement action. Similarly, the prospect of enforcement activity can lead firms to improve the quality of their disclosure. For further discussion of these interaction effects in the context of my study, *see infra* text accompanying notes 53-56.

[22] For a discussion of hedge fund liability, *see* Howard S. Meyers, *Hedge Fund Liability: Causes of Action Against Managers, Advisers*, 241 N.Y.L.J. 1 (2009). Claims tend to be

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C. Law of Disclosure and Enforcement for Investment Advisors

As with publicly traded companies, lawmakers have chosen a regulatory strategy for investment advisors that includes both mandatory disclosure and enforcement.[23] Unlike the rules that apply to public companies, however, the law governing disclosure and enforcement at American investment advisors has received scant attention.[24]

1. Mandatory disclosure. Most investment advisors in the United States are required to disclose extensive information to their investors in a filing known as Form ADV.[25] Form ADV requires annual disclosure on a wide range of governance matters, including the firm's clients, accounting practices, potential conflicts of interest, and prior disciplinary history.[26]

Although Form ADV has received limited attention from law and business scholars alike,[27] the disclosure gives investors important

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based on common-law actions such as fraud or breach of fiduciary duty. Many of these lawsuits have only limited financial success because they are initiated after the money has disappeared.

[23] To be sure, there are differences in enforcement, particularly private enforcement, between investment advisors and public corporations. For a discussion of these differences, *see infra* Part III.C.

[24] *But see* John Morley & Quinn Curtis, *An Empirical Study of Mutual Fund Excessive Fee Litigation: Do the Merits Matter?,* 30 J. L. ECON. & ORG. 275 (2014).

[25] Advisors must file Form ADV in accordance with 17 C.F.R. § 275.203-1 (2015). Some of these advisors are also required to file Form PF, a new form required by the DFA, but Form PF is not publicly available and is exempt from Freedom of Information Act ("FOIA") requests. *See* Release No.: IA-3308 (Oct. 31, 2011). Although some funds are also required to file Form 13F, many advisors are exempt from this requirement because they have less than $100 million in applicable securities. 15 U.S.C. § 78m(f)(1) (2015).

[26] 17 C.F.R. § 279.1 (2015).

[27] For a rare exception, *see* Stephen Dimmock & William Gerken, *Predicting Fraud by Investment Managers*, 105 J. FIN. ECON. 153 (2012).

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information about their advisors. For example, some 21% of the advisors in my dataset disclosed a crime or regulatory infraction. Another 28% disclosed that they are not audited at least annually by an independent accountant. And 14% disclosed a significant potential conflict of interest.[28]

Regulators contend that mandatory disclosure on Form ADV has two primary benefits for investors. First, as former SEC Commissioner Harvey Goldschmid noted, the disclosure saves investors "separate, costly, duplicative investigations and other 'due diligence' expenses. Why would you want to have 'due diligence' investigations repeated time and time again by different investors as opposed to making the information available publicly and all in one place?"[29] Second, the information in Form ADV helps regulators to better assess the risks posed by individual funds and to protect the securities market.[30]

2. Public Enforcement. Investment advisors, regardless of whether they are regulated, can be subject to enforcement actions for fraud. However, regulated advisors, unlike unregulated advisors, are also generally subject to SEC compliance examinations, which involve detailed inspections of the fund and its managers by SEC officials. These inspections, which have been suggested to reduce fraud,[31] vary

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[28] By "significant potential conflict of interest," I specifically refer to funds that participate in either principal transactions or agency cross trades.

[29] *See* CBS, *supra* note 8, at 6.

[30] *See* CBS, *supra* note 8, at 6-7.

[31] The exams are thought to reduce managers' incentives for taking actions that are counter to their investors' best interests. *See* Registration Under the Advisers Act of Certain Hedge Fund Advisers, Investment Advisers Act Release No. 2333, 69 Fed. Reg. 72,054, 72,061 (Dec. 10, 2004) ("The prospect of a Commission examination . . . increases the risk of getting caught, and thus will deter wrongdoers. This risk should alter hedge fund advisers' behavior") [hereinafter HF Rule]. Of course, investment advisors

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substantially in scope, ranging from simple records requests to onsite exams lasting for several weeks. It is important to note that the exams are largely focused on whether the advisor has fulfilled the compliance requirements of the Investment Advisers Act of 1940 ("IAA"), such as record-keeping and proper client communication. While the exams may peripherally address the accuracy of the advisor's public disclosure, the accuracy of this information is not generally the primary focus. Following the exams, most advisors are given the opportunity to address any issues that the SEC has uncovered.[32] However, some examinations reveal unlawful acts that lead to enforcement actions.[33]

D. Agency Costs at Investment Advisors

Previous work has identified a wide range of potential agency problems in the public-company context.[34] By contrast, there has been limited academic study on agency costs at investment advisors. As explained below, however, these advisors may well have opportunities to pursue their own interests at the expense of investors.

1. Examples. The agency problem at investment advisors stems from the inherent conflicts of interests between investors and fund managers. Investors prefer that managers maximize returns and minimize expenses, while managers seek to maximize their private gains. To help

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are subject to enforcement from non-SEC sources as well. For a discussion of these other sources of enforcement, *see infra* Part III.B.

[32] *See* LES ABROMOVITZ, THE INVESTMENT ADVISOR'S COMPLIANCE GUIDE 28 (2012). Most exams result in deficiency letters, and the advisor is asked to resolve the deficiency. *Id.* The deficiency letters are not publicly available.

[33] CBS, *supra* note 8, at 7 (noting that five of the previous eight actions the SEC brought against SEC-regulated advisors were discovered through SEC inspections).

[34] For two prominent examples of work on this subject, *see* James Alan Brickley et al., *Ownership Structure and Voting on Antitakeover Amendments*, 20 J. FIN. ECON. 267 (1988); Lucian Bebchuk et al., *Lucky CEOs and Lucky Directors*, 65 J. FIN. 2363 (2010).

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address this conflict, a very significant portion of managers' pay at some investment advisors—in particular, hedge fund advisors—is often based on the fund's profits.[35]

Still, managers' interests are unlikely to be perfectly aligned with investors'. For example, managers may pursue investments in transactions in which they have a personal interest. Managers may also give certain investors, such as their families and friends, preferential treatment over others. Alternatively, managers may extract private gains from third parties with whom the fund does business—for example, side payments from brokers in exchange for servicing the fund's transactions.[36]

2. Misreporting as an agency-cost proxy. Practical limitations make it difficult to empirically identify agency costs at investment advisors.[37] Instead, following previous work in the public-company

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[35] *See, e.g.*, Marcel Kahan & Edward B. Rock, *Hedge Funds in Corporate Governance and Corporate Control*, 155 U. PA. L. REV. 1021, 1064–66 (2007). Of course, other types of investment advisors, such as mutual fund advisors, may be restricted from tying compensation to profits through such performance fees. *See* 15 U.S.C. § 80b-5(a)(1).

[36] For a practitioners' perspective on potential conflicts of interests faced by hedge fund managers specifically, *see, e.g.*, CHRIS DAY, CARNE GROUP, CONFLICTS OF INTEREST IN HEDGE FUNDS: AVOIDING PITFALLS (2015).

[37] There are two reasons why it is challenging to measure these costs directly. First, unlike in the public company context, there is no previous work that establishes, a priori, what governance arrangements would be optimal for these advisors (for the seminal example of such work in the public company context, *see* Gompers et al., *Corporate Governance and Equity Prices*, 118 Q. J. ECON. 107 (2003)). Second, even if the literature did establish testable priors, funds not subject to the federal regulatory regime are not required to, and therefore generally do not, disclose information regarding their governance. Because of this, I choose to study a symptom of poor governance—misreporting—rather than to compare governance features before and after regulation.

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context,[38] I use a symptom of agency costs—misreporting of financial results—as a proxy for agency costs.[39] The intuition for this proxy is that, because managerial compensation and prestige are often tied to financial performance, managers have incentives to misreport financial results. To constrain such managerial incentives, companies need strong governance and compliance systems. When such systems are absent or weak, financial results are more likely to be misreported.

Although misreporting by hedge funds[40] is notoriously difficult to measure, because the funds' portfolio data are not publicly available,[41] I build on prior work and estimate misreporting using the three empirical measures described below. All measures are based on the monthly performance returns that hedge funds report to their investors.

a. "Spike at zero." First, I test whether a fund appears to misreport its monthly returns to avoid reporting a loss—in particular, by reporting

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[38] *See* Oren Bar-Gill & Lucian Bebchuk, *Misreporting Corporate Performance* (Harv. Law & Econ. Discussion Paper No. 400, 2002) (describing the relationship between agency problems, particularly those related to compensation, and misreporting).

[39] Some recent work has examined the relationship between regulation and misreporting of results at hedge funds. *See, e.g.*, Douglas Cumming & Na Dai, *Hedge Fund Regulation and Misreporting Returns,* 16 EUR. FIN. MGMT. 829 (2010); Stephen Dimmock & William Gerken, *Regulatory Oversight and Return Misreporting by Hedge Fund*s REV. FIN. (forthcoming 2015); Patrick Hoffman, *Does Audit Regulating Stifle Misreporting? The Case of the Hedge Fund Industry* (Oct. 1, 2013). To my knowledge, however, none of these previous studies have attempted to disentangle the effects of mandatory disclosure and enforcement on misreporting activity.

[40] Because my data and setting are specific to hedge funds, I refer to hedge funds throughout the following discussion even though they are only one type of investment fund. However, the measures of misreporting that I discuss here could capture misreporting at investment funds more generally.

[41] *See, e.g.,* Vikas Agarwal et al., *Do Hedge Funds Manage Their Reported Returns?,* 24 REV. FIN. STUD. 3282 (2011); Nicolas Bollen & Veronika Pool, *Suspicious Patterns in Hedge Fund Returns and the Risk of Fraud,* 25 REV. FIN. STUD. 2673 (2012).

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fewer monthly returns just below zero than would be expected based on the fund's number of monthly returns just above zero. The intuition is that, absent misreporting, monthly returns will follow a smooth and relatively normal distribution over time. Fund managers, however, have strong incentives to avoid reporting losses, so they alter (or "manage") monthly reported returns so as to turn small losses into small gains.[42] This means that the observations that would naturally have fallen into the bucket below zero instead fall into the bucket above zero, thus allowing the fund to report a small gain instead of a small loss. Figure I below provides the distribution of monthly returns for the funds in my dataset and shows that, consistent with this intuition, there is a "spike" in the distribution of fund returns at zero. That is, there are fewer than expected losses just below zero, and more than expected gains just above zero.
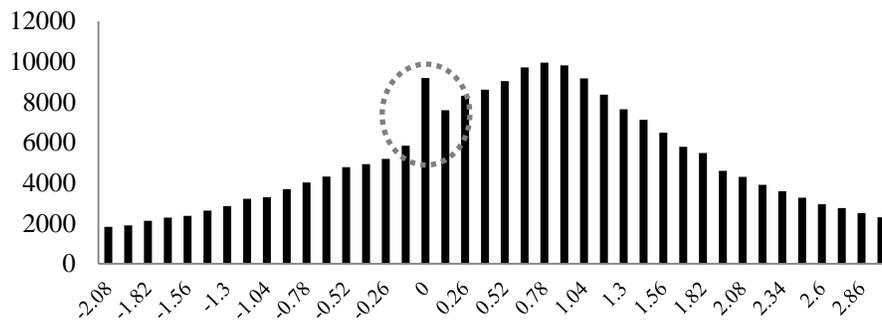
FIGURE I. DISTRIBUTION OF MONTHLY RETURNS

Figure I suggests that "earnings management," as it is sometimes known in the public-company context, is also quite prevalent among hedge funds. Indeed, this phenomenon has been documented by prior

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[42] *See, e.g.,* Nicolas Bollen & Veronika Pool, *Do Hedge Fund Managers Misreport Returns? Evidence from the Pooled Distribution*, 64 J. FIN. 2257 (2009); David Burgstahler & Ilia Dichev, *Earnings Management to Avoid Earnings Decreases and Losses*, 24 J. ACCT. ECON. 99 (1997).

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empirical work, which has shown that earnings management of this type is associated with fraud.[43]

    b. "Cookie jar" accounting. My second measure of misreporting is based on whether a fund uses so-called "cookie jar" accounting—that is, whether the fund accumulates reserves during good times in order to protect against bad times. When bad times arise, this practice allows the manager to reach into the "cookie jar" to inflate her reported results. The use of "cookie jar" accounting violates Generally Accepted Accounting Principles.

    One way to test for "cookie jar" accounting at hedge funds is to consider whether the fund reports abnormally high returns in December.[44] The idea is that funds accumulate reserves in the "cookie jar" throughout the year, and if bad times never arise, managers will recognize excess returns remaining in the "cookie jar" in December for two reasons. First, managers want these returns to be recognized before the year ends for purposes of determining their annual compensation. Second, most hedge fund audits take place at the end of the year, so managers are keen to bring their books into compliance with prevailing accounting standards before their auditors arrive. Figure II below shows the average returns for the hedge funds in my dataset, both in the month of December and in non-December months.

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[43] For an example, *see* Bollen & Pool, *supra* note 41 (showing that the size of a fund's kink is the strongest predictor of detected accounting fraud). The bin width of 13 basis points in Figure I is set according to the optimal bin width formula described in BERNARD SILVERMAN, DENSITY ESTIMATION FOR STATISTICS AND DATA ANALYSIS (1986).

[44] For the previous empirical work suggesting this test, *see* Agarwal et al., *supra* note 41.

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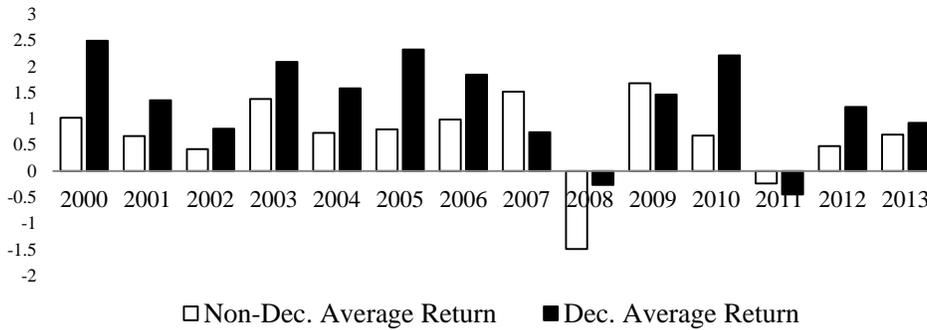
FIGURE II. MEAN MONTHLY HEDGE FUND RETURNS

As shown in Figure II, average returns in December are higher than average returns for other months in 10 out of the 13 years from 2000-2013, suggesting that some hedge funds indeed use "cookie jar" accounting. Notably, the years in which December returns are lower— 2007, 2009, and 2011—are years in which "cookie jar" accounting may not have been an option because of the financial crisis and its aftershocks.

c. Benford's distribution. Finally, my third measure of misreporting examines whether the distribution of each fund's monthly returns conforms to Benford's Law. Benford's Law states that, when many distributions are aggregated together, the first digits in the resulting distribution will follow a specific logarithmic curve.[45] Benford's Law specifically predicts that the first digit of monthly returns reported by hedge funds should be a one 30.1% of the time, a two 17.6% of the time, and so on, with other digits appearing less frequently until nine, which

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[45] *See* Frank Benford, *The Law of Anomalous Numbers*, 78 PROCEEDINGS AM. PHIL. SOC'Y 551 (1938).

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only appears as the first digit in 4.6% of all observations.[46] The intuition for the law is that the percentage change needed to "roll over" (i.e., to increase the first digit) of a fund's monthly return is greater for lower numbers. For example, suppose a fund wants to grow its profits from one million dollars to two million dollars. To do so, it must double its profits. But the same fund can increase its profits from eight million dollars to nine million dollars by increasing its profits by just 12.5%. Because of these differences in the percentage change necessary to "roll over" from lower digits to higher ones, the average fund will spend more time with profits between one and two million dollars than it will with profits between eight and nine million dollars. Thus, we expect that more observations of the fund's profits will begin with one or two than with eight or nine.

Although Benford's Law is widely used to detect financial fraud,[47] I am unaware of any previous work applying Benford's Law to hedge fund returns. Hence, as a first step, Figure III below describes the distribution of the first digit of monthly returns (1) that is predicted by Benford's Law; (2) of the funds in my dataset; and (3) of Bernie Madoff's infamous investment fund:

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[46] The formula for Benford's Law is $P(d)=\log_{10}(1+(1/d))$, where d is the first digit and ranges from one to nine. Thus, the expected distribution for digits one through nine is 30.1%, 17.6%, 12.5%, 9.7%, 7.9%, 6.7%, 5.8%, 5.1%, and 4.6%, respectively.

[47] *See, e.g.*, Amiran et al., *Financial Statement Irregularities: Evidence from the Distributional Properties of Financial Statement Numbers,* REV. ACCT. STUD. (forthcoming) (finding that Benford's Law can be used to predict material misstatements at public companies); Marco Corazza et al., *Checking Financial Markets via Benford's Law: The S&P 500 Case*, in MATHEMATICAL AND STATISTICAL METHODS FOR ACTUARIAL SCIENCES AND FINANCE 93 (2010) (showing that stock market returns generally conform to Benford's Law, except on days such as September 11, 2001).
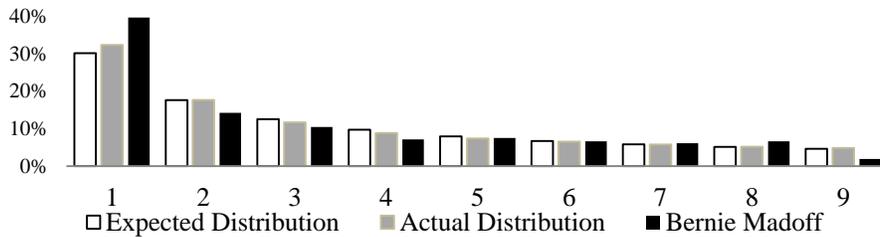
Disclosure Versus Public Enforcement

FIGURE III. DISTRIBUTION OF FIRST DIGITS IN HEDGE FUND RETURNS[48]

Figure III indicates that the vast majority of fund returns conform to Benford's Law.[49] For example, Benford predicts that 30.1% of fund returns will start with a one (reflected by the white bar), and the actual distribution shows that 32.3% start with a one (reflected by the grey bar). By contrast, a whopping 39.6% of Madoff's returns started with a one—a significant deviation.[50]

Throughout this Article, I use all three of these measures of misreporting as proxies for agency costs at hedge funds.[51] The measures

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[48] I assembled Bernie Madoff's returns using marketing materials from the Fairfield Sentry fund, a fund-of-funds that invested solely with Madoff. *See* Henry Blodget, *Bernie Madoff's Miraculous Returns: Month By Month*. BUS. INSIDER (Dec. 12, 2008).

[49] Benford's Law will apply when the distribution of the log values of the data are generally smooth, symmetrical, and spread across several orders of magnitude. My data meet these requirements. *See infra* Appendix, at text accompanying notes 135-36.

[50] Of course, anecdotal evidence that Madoff's returns were inconsistent with Benford's Law does not demonstrate that such a deviation reflects agency problems at hedge funds. In the Appendix, however, I provide additional evidence of the link between deviations from Benford's Law and fraud. For example, although 32% of the funds in my sample identified by the SEC as fraudulent deviated from Benford's Law, only 18% of the general hedge fund population deviated. *See infra* text accompanying notes 137-38.

[51] Although these measures of misreporting are imperfect, given the difficulty of measuring agency costs and the data limitations, they represent the best available options.

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allow us to consider, for the first time, the separate effects of mandatory disclosure and enforcement intensity on agency problems at these funds.

E. Optimal Mix of Disclosure and Enforcement at Hedge Funds

As explained above, regulated hedge funds and other investment advisors are subject to *both* mandatory disclosure requirements and public enforcement. That is unsurprising: lawmakers typically make use of both mechanisms because neither is a mutually exclusive tool for reducing agency costs. Thus, the key question in optimal regulatory design is the relative investments the government should make in each.

The answer is ultimately empirical, resting on the particular circumstances of the firms and investors at issue.[52] Despite the importance of this question, however, there has been limited empirical study of the optimal balance between mandatory disclosure and enforcement. The reason is that lawmakers usually change *both* the law of disclosure and

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Moreover, in addition to serving as a proxy for agency costs, it is important to study misreporting at hedge funds because these funds manage trillions of dollars, and their investors, primarily pension funds, will bear the costs of fraud.

[52] The optimal balance between mandatory disclosure and enforcement efforts is often thought to depend upon, among other considerations, the firm's investor base. *See, e.g.,* Stephen Choi, *Regulating Investors Not Issuers: A Market-Based Proposal*, 88 CAL. L. REV. 279 (2000). Disclosure is likely to provide the greatest benefit to engaged, sophisticated investors who can interpret and use the disclosed information at lowest cost. *See, e.g.,* Zohar Goshen & Gideon Parchomovky, *The Essential Role of Securities Regulation,* 55 DUKE L.J. 711 (2006) (arguing that securities laws should be designed for sophisticated institutional investors and, therefore, focus on disclosure). By contrast, investments in enforcement may be necessary to protect rationally apathetic or unsophisticated investors who are unlikely or unable to make effective use of information revealed through mandatory disclosure. *Cf.* Luigi Zingales, *The Future of Securities Regulation*, 47 J. ACCT. RES. 391, 417 (2009) (suggesting that unsophisticated investors should be "nudged" out of equities markets).

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enforcement intensity at the same time.[53] This prevents empiricists from identifying whether the outcomes we observe after the law changes result from changes in the law of disclosure, the law of enforcement, or both.[54]

Another challenge is that disclosure and enforcement have *complementary* effects: disclosed information can lead to enforcement actions, and the prospect of additional enforcement can improve the quality of disclosure.[55] That is especially true of private enforcement, which relies heavily upon disclosed information. For purposes of this Article, however, I focus on disentangling the effectiveness of mandatory disclosure[56] and *public* enforcement, as reflected by Form ADV and compliance exams, respectively.

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[53] *See, e.g.,* John C. Coffee, Jr., *The Political Economy of Dodd-Frank: Why Financial Reform Tends to be Frustrated and Systemic Risk Perpetuated*, 97 CORNELL L. REV. 1029-30 (2012) (explaining that regulatory changes tend to occur simultaneously).

[54] For this reason, previous empirical studies that have attempted to disentangle the effects of mandatory disclosure and enforcement have often been quite controversial. For example, after the widespread adoption of International Financial Reporting Standards (IFRS), several studies contended that the increased liquidity that followed was attributable to the increased disclosure required by IFRS. But a later study questioned whether these benefits were due to the additional disclosure requirements or the increased enforcement intensity that arose at the same time. *See* Hans Christiansen et al., *Mandatory IFRS Reporting and Changes in Enforcement,* 56 J. ACCT. ECON. 147 (2013). Later work contended that the interaction *between* enhanced disclosure and increased enforcement might also have produced these benefits. *See* Mary Barth & Doron Israeli, *Disentangling Mandatory IFRS Reporting and Changes in Enforcement,* 56 J. ACCT. ECON. 178 (2013).

[55] Barth & Israeli, *supra* note 54, at 179 ("The benefits of enforcement depend on the quality of the [disclosure], and the benefits of [disclosure] rely on the strength of the enforcement").

[56] Suppose, for example, that because of changes in disclosure rules market participants are better able to monitor a fund and, in doing so, learn worrisome information that leads them to remove their capital from that fund. In this hypothetical, where the disclosure

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II. DISCLOSURE VERSUS ENFORCEMENT AT HEDGE FUNDS

As noted previously, the key question regulators make in optimal regulatory design relates to their respective investments in disclosure and enforcement. For lawmakers to understand how to make these choices, however, we need to understand how mandatory disclosure rules and enforcement activity interact with agency costs. In this Part, I provide the first empirical study disentangling the effects of disclosure and enforcement on agency problems at hedge funds.[57]

My analysis exploits an unusual series of changes in the law of hedge funds. Between 2004 and 2010, groups of hedge funds were, ***first,*** made subject to significant disclosure and enforcement rules by the SEC; ***second,*** relieved by the courts of both their disclosure and enforcement obligations; and ***third,*** again made subject to disclosure and enforcement requirements, this time by Congress.

These repeated changes in the law allow me to disentangle the effects of disclosure and enforcement on agency problems at hedge funds. The evidence points to two key findings. First, I show that regulation does indeed reduce agency problems at hedge funds. Second, I provide evidence that this effect is driven by mandatory disclosure rules.

A. Setting

The SEC took a largely "hands off" approach to hedge fund regulation until the collapse of Long Term Capital Management L.P.

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rules enhanced the effectiveness of private enforcement, I attribute the effects of the investors' exit—and the *ex ante prospect* of that exit—to the change in disclosure rules.

[57] This Section emphasizes the intuition behind the empirical analyses, but detailed discussion of the methodology and tabulated test results are provided in the Appendix.

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("LTCM"), a prominent hedge fund, in 1998.[58] Indeed, prior to the legal changes I study here, hedge fund regulation was often considered voluntary and fewer than half of hedge funds were regulated by the SEC.[59] Following the collapse of LTCM, however, the SEC became concerned that hedge funds could pose systemic risk to the entire financial system and passed a controversial rule[60] that set off a series of regulatory changes.[61] Below, I describe the three separate changes to federal law in this area and how they offer repeated tests of the relationship between regulation and agency costs.

1. The SEC's "Hedge Fund Rule." The first change occurred in 2004, when the SEC proposed to subject the vast majority of unregulated hedge funds to federal disclosure and enforcement rules for the first time.[62] Prior to the proposal, there was a loophole granting advisory firms with fewer than 15 "clients" over the past twelve months an exemption from the IAA.[63] Under this exemption, "client" was defined to include only immediate investors, allowing funds to avoid regulation by using a legal structure in which investors placed their money in sub-funds that invested in the parent fund rather than investing in the parent fund

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[58] LTCM incurred such spectacular losses that the Federal Reserve orchestrated a $3.6 billion bailout. Michael Fleming & Weiling Liu, Federal Reserve Bank of New York, *Near Failure of Long-Term Capital Management* (Sept. 1998).

[59] CBS, *supra* note 8, at 7 (stating that an estimated 40% of all hedge fund advisors were regulated by the SEC prior to the adoption of the Hedge Fund Rule).

[60] The proposal drew two dissenting votes from sitting Commissioners. The written dissent is appended to the HF Rule. *See* 69 Fed. Reg. at 72,089 [hereinafter Dissent].

[61] *See*, STAFF REPORT TO THE UNITED STATES SECURITIES AND EXCHANGE COMMISSION, IMPLICATIONS OF THE GROWTH OF HEDGE FUNDS 1-2 (Sept. 2003).

[62] *See* HF Rule, *supra* note 31.

[63] Registration under the Advisers Act of Certain Hedge Fund Advisers, Investment Advisers Act Release No. 2266, 69 Fed. Reg. 45,172 (July 28, 2004). The exemption also stated that the advisor could not hold itself out as an investment advisor or advise a registered investment company. *See* IAA § 203(b)(3), 15 U.S.C. § 80b-3(b)(3) (2006).

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directly.[64] The proposal redefined client to include all investors rather than only immediate investors, thus largely eliminating the exemption.[65] Despite the controversy, the SEC adopted the new Hedge Fund Rule in December 2004, and the newly regulated funds were required to submit to the SEC's disclosure and enforcement rules no later than February 1st, 2006.[66]

2. Goldstein v. SEC. In response, the newly regulated hedge funds sued the SEC. In a closely watched lawsuit, Phillip Goldstein of Bulldog Investors alleged that the SEC had overstepped its authority. In June 2006, the D.C. Circuit agreed and vacated the Hedge Fund Rule.[67] In August 2006, the SEC stated that it would not appeal the court's decision, making clear that the funds subjected to the SEC's disclosure and enforcement authority by the Hedge Fund Rule would be allowed to withdraw from federal oversight.[68]

3. The Dodd-Frank Act. Congress responded in the Dodd-Frank Act ("DFA"). Although the DFA included a complex series of provisions in this area, for present purposes I only note that the DFA mandated that most hedge funds would again be subject to federal disclosure and

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[64] *Id.* (e.g., if five investors jointly formed Fund Alpha and Fund Alpha invested in Fund Beta, Fund Beta was only required to consider Fund Alpha as one client rather than five).

[65] *See* HF Rule, *supra* note 31.

[66] As a technical matter, the Hedge Fund Rule required these advisors to "register" with the SEC—an act that subjects an investment advisor to the disclosure and enforcement requirements described in Part I.C. In addition, registration subjects the advisor to the SEC's rules regarding compliance, such as the requirement that the advisor adopt written compliance policies and procedures. *See* ABROMOVITZ, *supra* note 32, at 227-45.

[67] 451 F.3d 873, 884.

[68] *See* Christopher Cox, Chairman, SEC, Statement Concerning the Decision of the U.S. Court of Appeals in *Phillip Goldstein, et al. v. SEC* (Aug. 7, 2006).

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enforcement requirements.[69] This change required many unregulated funds—including those that had previously withdrawn from federal oversight after the *Goldstein* case—to submit to federal oversight.

B. Dataset and Methodology

To evaluate how these legal changes affected agency costs at hedge funds, I assembled a dataset from two key sources. First, I gathered data on the governance of each fund from historical Form ADV filings; although these data are generally not publicly available, I obtained them by filing Freedom of Information Act requests with, among others, the SEC.[70] Second, I combined that information with data on each fund's returns drawn from the Lipper Hedge Fund database, a commercial database to which hedge funds voluntarily[71] report their returns.

The resulting dataset allows for analysis using a "difference-in differences" approach. That is: I examine the change in misreporting for the funds affected by the change in the law (the "treatment" group) relative to the change in misreporting for the funds that were *not* affected

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[69] *See* Dodd-Frank Act, § 401-410. Only a very limited number of funds are still exempt from regulation. *See id.*, § 403, §409. As described *infra* Part II.D., the DFA created the equivalent of three new groups of funds: one newly subject to federal disclosure rules, one newly subject to federal enforcement, and one newly subject to both federal disclosure rules and enforcement.

[70] For a detailed description of these requests, *see infra* Appendix, at note 128.

[71] The use of voluntarily provided data can result in a self-selection bias. To address this potential bias, I take two steps. First, I use only data that have not been "backfilled" (i.e., I exclude fund data that are reported retrospectively). Second, I limit all analyses to funds that provide data both before and after the change in law (i.e., I use a shock-based design without attrition). As a practical matter, voluntarily provided data are widely used in research on hedge funds because they are the only performance data available. *See* Vikas Agarwal, Vyacheslav Fos, & Wei Jiang, *Inferring Reporting Biases in Hedge Fund Databases from Hedge Fund Equity Holdings,* 59 MGMT. SCI. 1271 (2013).

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by that change in the law (the "control" group). The methodology, which is standardized across all tests, is described in detail in the Appendix.[72] In addition, there I describe the challenges of assigning funds to the treatment and control groups and in identifying the timing of each legal change. For now, it suffices to say that I compare misreporting in the thirty months before and after each change in law, and all funds lacking sufficient data are omitted from the analysis so that the sample will not be biased due to attrition. Additionally, all regressions control for fund specific characteristics, such as the value of assets under management and average monthly performance, and include fixed effects.[73]

The use of a control sample offers the significant methodological advantage of capturing factors that could influence misreporting but are not related to the legal changes that I study here. There is a concern with this approach, however. Ideally, the control sample would include a randomly drawn group of funds that were not subject to the legal changes that affected funds in the treatment group. In this case, however, the funds in the control sample cannot be randomly drawn, because the only funds not affected by those legal changes were the funds already subject to federal disclosure and enforcement rules.[74]

Therefore, the control funds are not random: they have one or more characteristics that led them to be subject to federal oversight prior to the

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[72] S*ee infra* Appendix, at text accompanying notes 139-50.

[73] *See infra* Appendix, at note 141.

[74] Many foreign funds were exempt from mandatory regulation during this period. However, funds completely exempt from U.S. regulation are poorly suited for a control sample in this instance because they are also exempt from other changes in the U.S. legal regime. For example, the SEC greatly strengthened its antifraud rules following the *Goldstein* case, and the updated requirements applied to all U.S. funds—regulated or not. Although the funds in my control and treatment samples would both be affected by this type of change, foreign funds would not. It is important to control for these types of changes that, while important, are not directly related to the changes in law I study here.

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changes in law I study here. Some of these funds voluntarily submitted to federal regulatory oversight, perhaps to increase their profile or at the request of a client. Other funds were regulated because they did not fit either of the other two requirements necessary to be eligible for the "fewer than 15 clients" exemption.[75] Of course, the nonrandom assignment of the treatment and control funds leads to a concern that the funds in these groups may not be comparable. To address this concern, my analysis includes a series of robustness tests designed to address potential sample selection issues. The results are consistent in these additional analyses, providing confidence that my analysis uncovers a causal link as opposed to mere correlation.

C. The Effect of Hedge Fund Regulation on Misreporting

In this section, I present empirical evidence showing that hedge fund regulation reduced agency costs at hedge funds, as reflected in the funds' level of misreporting. My setting permits me to consider the effects both of *imposing* federal disclosure and enforcement oversight and of *removing* those requirements. I find consistent evidence across both types of regulatory changes.

1. Imposition of federal regulation. I begin by comparing the change in misreporting at the treatment funds relative to the change in misreporting at the control funds after the two legal developments that subjected treatment funds to federal disclosure and enforcement rules: the adoption of the Hedge Fund Rule in 2004 and the adoption of the SEC rules implementing the Dodd-Frank Act in 2011.[76]

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[75] Advisors seeking to rely on this exemption were not allowed to publicly hold themselves out to be investment advisors and could not have a registered investment company, such as a mutual fund, as a client. *See supra* note 63.

[76] Throughout this Part, I present figures based on coefficients from ordinary least squares estimations, and I use the standard indicia of significance: Significance levels of

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To do this, I run difference-in-differences regressions in which the dependent variable reflects the level of misreporting at each hedge fund. As explained in Part I.D., drawing on previous work in the accounting and finance literature, I use three measures, or "flags," as proxies for evidence of misreporting.[77] I therefore consider two different dependent variables in my regressions: (1) the *number* of misreporting flags present at a fund, and (2) whether *any* of the three flags is present at a fund. I examine each dependent variable separately for the adoption of both the Hedge Fund Rule and the DFA. Figure IV below summarizes the results.
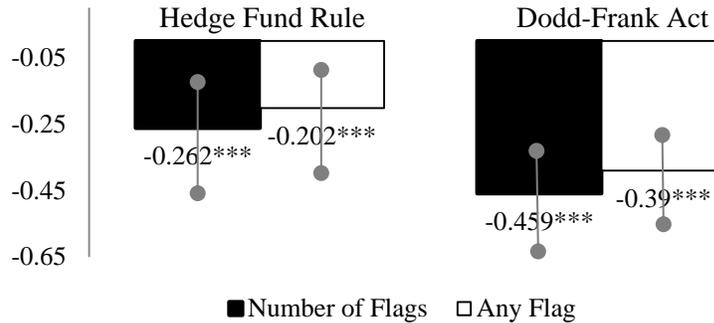
FIGURE IV. DECREASE IN MISREPORTING AFTER IMPOSITION OF MANDATORY REGULATION

As Figure IV[78] shows, the evidence indicates that subjecting funds to federal disclosure and enforcement rules decreased misreporting. Based on the expectations set by the control group, both the total number of flags

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1%, 5%, and 10% are indicated by ***, **, and *, respectively. The gray bars demonstrate the 95% confidence intervals for each coefficient.

[77] *See supra* Part 1.D. Recall that the three measures of misreporting are whether there is a "spike" in returns above zero, whether the fund managers use "cookie jar" accounting, and whether the fund returns conform to Benford's distribution.

[78] The full regression models are presented in Tables I & II in the Appendix. The figure is based on the coefficients for the interaction terms in the models in columns A.1. and C.1. of these two tables.

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triggered by each fund (the black bar), and whether a fund triggered any flag (the white bar) decreased for the newly regulated funds after the Hedge Fund Rule and the DFA were adopted. And this decrease in misreporting was both statistically and economically meaningful. For example, following the adoption of the Hedge Fund Rule, the funds subjected to regulation by that Rule, on average, triggered 0.262 fewer flags than would have been expected based on the control sample. Similarly, these funds were 20.2% less likely to trigger *any* flag for misreporting (again, relative to the control sample).

In plain English, the results indicate that the treatment funds were 20-25% more likely to trigger a flag for misreporting than the control funds prior to the Hedge Fund Rule but were equally likely to trigger a flag after the Hedge Fund Rule. The result was even stronger after the adoption of the DFA. The treatment funds were again 20-25% more likely to trigger a flag than the control funds prior to the change in law, but were slightly *less* likely to trigger a flag after the change.

To summarize, this evidence suggests that the imposition of federal regulation reduced misreporting at hedge funds. I cannot rule out, however, the possibility that the timing of these regulatory changes happened to coincide with a decrease in misreporting that would have occurred regardless of the regulation. Thus, in search of additional evidence on the relationship between federal regulation and misreporting, I now turn to the effects of the D.C. Circuit's decision in *Goldstein*.

2. Removal of federal regulation. After the D.C. Circuit vacated the Hedge Fund Rule in the *Goldstein* case, funds that had been subject to the Rule were given a choice: they could voluntarily remain subject to federal disclosure and enforcement oversight or elect to opt out of federal regulation. I divide these funds into two groups: those that chose to remain subject federal oversight and those that chose to exit the federal regulatory regime. Then, using a difference-in-differences approach that compares

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these two groups of funds with the control funds, I examine the change in misreporting in each group following the court's ruling in *Goldstein*. The results of that analysis are described in Figure V below.
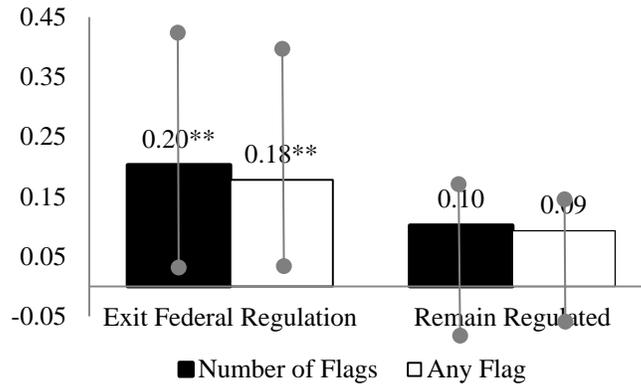
FIGURE V. POST-*GOLDSTEIN* CHANGE IN MISREPORTING FOR FUNDS REGULATED IN ACCORDANCE WITH THE HEDGE FUND RULE

As Figure V shows, after *Goldstein*, misreporting increased significantly at funds that chose to exit the federal regulatory regime.[79] The 95% confidence intervals indicate that the increase in misreporting for the funds that opted out of federal regulation was significantly greater than the change in misreporting for the control group. By contrast, the funds that remained subject to federal disclosure and enforcement rules did not, after *Goldstein*, experience a significant change in misreporting relative to the control funds. Taken together with the evidence on the effects of the Hedge Fund Rule and the DFA, these results provide strong evidence that hedge fund regulation reduced misreporting.

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[79] Full regression models are presented in Table III in the Appendix. Figure V reflects the coefficients for the interaction terms in the models in columns A.1 and C.1 of this table.

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3. Sample selection concerns. As discussed earlier, the nonrandom assignment of the treatment and control funds leads to concerns that these groups of funds may not be comparable. Indeed, these two groups differ across several observable characteristics; following both the Hedge Fund Rule and the DFA, the newly regulated funds were significantly younger, more likely to be foreign, had better performance, and had greater return volatility than the control funds. These observable differences suggest that the funds may differ across unobservable characteristics as well.

The Appendix describes additional robustness tests that are designed to address concerns regarding the comparability of these groups. First, I use propensity score matching, a statistical technique designed to identify the subset of treatment and control funds that are comparable to one another, and I rerun all tests using only the matched sample.[80] Second, I omit the control sample entirely, and I rerun all tests using only the treatment funds, meaning that the tests compare misreporting at each fund after the change in law relative to misreporting at that same fund before the change in law.[81] The results are consistent in these additional analyses, providing confidence in the difference-in-differences approach.

D. Disentangling the Effects of Disclosure and Enforcement

Having provided evidence that the legal changes I examine here reduced hedge fund misreporting, I now turn to a separate question: *why* did these changes to the law reduce misreporting? Did the application of the federal disclosure rules, the federal enforcement regime, or both produce the reduction in misreporting that I have documented? My unique setting allows me to provide the first-ever empirical tests separately identifying the effect of each factor on agency costs at hedge funds.

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[80] *See infra* Appendix, at text accompanying notes 155-59.

[81] *See infra* Appendix, at text accompanying notes 164-65.

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       1. Disclosure versus enforcement. Recall that, as noted in Part II.A., the DFA made significant changes to federal law on hedge fund regulation.[82] These changes, which I describe in more detail below, created three groups of hedge funds. Although the previous analysis in this Article considered only the first group of funds—those newly subject to changes in both federal enforcement and disclosure—in this Section I examine all three groups.

- *Disclosure & Enforcement.* First, as discussed previously, the DFA subjected the majority of unregulated funds to *both* federal disclosure and enforcement rules. These were the funds studied in the analysis described in Part II.C. above. Unless a fund is eligible for one of the categories below, it will fall into this group by default.

- *Disclosure-only.* Second, in an effort to reduce the costs associated with hedge fund regulation, a subset of funds was exempted from federal enforcement rules—but not federal disclosure obligations. These firms, known as Exempt Reporting Advisers, were eligible for exempt status because they advised only venture capital funds or only private funds with less than $150 million of U.S. assets.[83]

- *Enforcement-only.* Third, the DFA subjected a group of funds that were already complying with federal disclosure rules—but were not yet subject to federal enforcement—to the federal enforcement regime. The funds in this third group were regulated by a state prior to the DFA, but

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[82] *See supra* text accompanying note 69.

[83] Congress exempted these funds from the compliance requirements of the Adviser's Act, and the SEC exempted these funds from their federal enforcement requirements. *See* Dodd-Frank Act, § 407, § 408. *See* Exemptions for Advisers to Venture Capital Funds, Private Fund Advisers With Less Than $150 Million in Assets Under Management, and Foreign Private Advisers, 76 Fed. Reg. 39,646, 39,666 (July 6, 2011) (to be codified at 17 C.F.R. pt. 275). *See* Mary Schapiro, Chairman, SEC, Opening Statement at SEC Open Meeting: Dodd-Frank Act Amendments to the Investment Advisers Act (June 22, 2011).

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were required to switch to the federal regulatory regime because of a requirement in the DFA that, subject to limited exceptions, advisory firms with more than $100 million in assets were required to submit to federal authority.[84]

The outcome of these changes was that the DFA created three groups of hedge funds, all subject to different changes in regulation. Although these extensive changes could be criticized as typically puzzling federal interventions in complex private markets,[85] they offer an attractive setting for empirical study. The reason is that the law simultaneously created three groups of funds: one newly subject to *both* federal disclosure and enforcement law, another newly subject *only* to federal disclosure rules, and a third newly subject *only* to federal enforcement oversight.

To study the relative importance of each regulatory tool, I compare misreporting at each of the three groups of funds relative to the control funds. The results are presented in Figures VI and VII. Figure VI reflects misreporting[86] for each group of funds relative to misreporting at the

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[84] *See* Dodd-Frank Act, *supra* note 69, §410. *See* OFFICE OF INVESTOR EDUCATION AND ADVOCACY, SEC, INVESTOR BULLETIN: TRANSITION OF MID-SIZED INVESTMENT ADVISERS FROM FEDERAL TO STATE REGISTRATION 1-2 (Dec. 2011). Of course, these funds were already subject to state enforcement before the DFA, but I consider them to have become subject to an increase in enforcement because almost all the funds in my sample switched from New York—a state that did not conduct compliance examinations—and therefore became subject to compliance exams for the first time upon their switch to the federal regulatory regime.

[85] Upon its passage, Sen. Chris Dodd famously remarked of his own law, "[n]o one will know until this is actually in place how it works." David Cho et al., *Lawmakers guide Dodd-Frank Bill for Wall Street Reform into Homestretch*, WASH. POST (June 26, 2010).

[86] For concision, in Figures VI and VII, I measure misreporting only through the average number of "flags" for misreporting triggered by each fund. However, as noted in the Appendix, the intuition in Figures VI and VII is consistent if I instead measure misreporting as whether a fund triggers *any* flag for misreporting.

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control funds *before* the DFA, and Figure VII shows the change in misreporting *after* the DFA.[87] As before, all values are based on coefficients from regression analysis, and thereby already account for control variables and fixed effects.
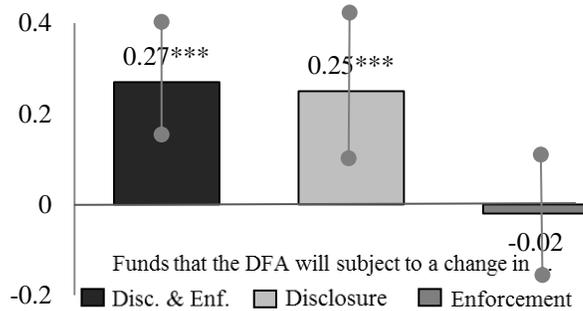
FIGURE VI. MISREPORTING BEFORE THE DFA, BY TYPE OF REGULATION

Figure VI offers two important insights about misreporting at these three groups of funds before the DFA. First, it shows that the level of misreporting at the two groups of funds that were not subject to federal disclosure law was statistically greater than the control funds and statistically comparable to one another.[88] Second, Figure VI shows that the level of misreporting at the third group of funds—that is, funds that were already subject to federal disclosure rules but not the federal enforcement regime—was not statistically different from misreporting at the control

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[87] Figure VI reflects coefficients for each of the three groups of funds in the period prior to regulation. The coefficients are from the model in column C.1. of Table IV.

[88] As Figure VI shows, the regression coefficients for the groups of funds that the DFA (1) subjected to both federal disclosure and enforcement rules and (2) subjected only to federal disclosure rules were 0.27 and 0.25, respectively, and both of these coefficients are statistically significantly greater than zero. In the Appendix, I compare these coefficients in F-tests and show that they are not statistically significantly different *from each other*—that is, misreporting at these funds was statistically equivalent prior to the DFA. *See infra* Appendix.

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funds, suggesting that the disclosure rules that already applied to these funds may have led to reduced misreporting.

        While descriptively interesting, Figure VI only shows the relative level of misreporting *prior* to the DFA. The more interesting question is how misreporting changed *after* the DFA. Figure VII[89] reflects this result:
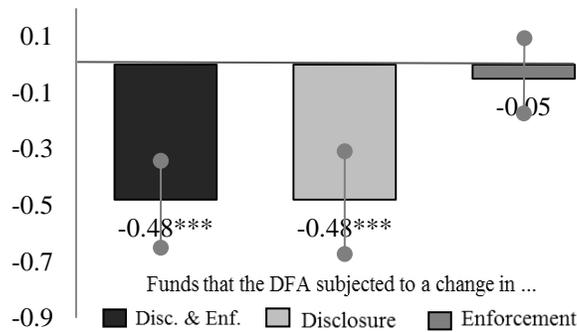
FIGURE VII. CHANGE IN MISREPORTING AFTER THE DFA

Figure VII indicates that changes in mandatory disclosure, rather than enforcement, drive the reduction in misreporting identified in the previous section. After the DFA, both groups of funds that were newly subjected to federal disclosure rules significantly decreased misreporting relative to the control funds.[90] The change in misreporting for the funds newly subjected to federal enforcement, however, was statistically indistinguishable from that in the control funds.

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[89] Figure VII reflects coefficients for the interaction terms presented in the model in column C.1. of Table IV.

[90] Again, as described in further detail in the Appendix, I compare the regression coefficients to *each other* and show that the decreases in misreporting at the two groups of funds that became subject to federal disclosure rules are statistically equivalent.

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3. Robustness tests. Although this empirical setting is attractive because different funds were subject to different changes in regulation, one concern is that the funds in each group were not randomly selected. Instead, the funds were assigned to each group based on factors such as the dollar value of assets under management. While random assignment in financial regulatory settings is exceptionally rare, the nonrandom nature of Congress's choices creates some risk of sample bias.

As described in the Appendix, I take two steps to address sample selection concerns. First, I use propensity score matching to identify comparable funds from each group.[91] Second, I use a quasi-discontinuity analysis to compare those funds that were eligible for the disclosure-only regime with those that were almost eligible.[92] The results from these tests are consistent with the initial analysis. Also, to address the possibility that exams reduced misreporting at the funds most likely to be examined even if they did not reduce misreporting on average, I separated those funds most likely to be examined and tested whether they had a greater decrease in misreporting than the funds less likely to be examined. They did not.[93]

E. Governance Changes Spurred by Disclosure

My evidence shows that the imposition of mandatory disclosure, even without a concurrent change in enforcement, can reduce misreporting. This result is surprising—especially when one considers that

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[91] *See infra* Appendix, at text accompanying notes 159-60.

[92] *See infra* Appendix, at text accompanying notes 161. I compare firms with just above and below $150 million in US assets under management—the eligibility threshold for the disclosure-only regime.

[93] *See infra* Appendix, at text accompanying notes 162-63. I determined whether a fund was more likely to be examined based on whether it is "high-risk" according to its Form ADV disclosures and, because the SEC displays a clear preference to examine firms closer to its offices, based on whether the fund is within 100 kilometers of an SEC office.

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the required disclosures are related to the fund's governance, not its financial performance.

1. Disclosure mechanism. To better understand how disclosure of governance information could reduce misreporting of financial performance, I reached out to hedge fund compliance officers and other practitioners to ask for their perspective. These inquiries provided helpful anecdotal evidence outlining two possible mechanisms through which the imposition of disclosure requirements could have reduced misreporting.

First, upon being required to publicly disclose whether they conformed to best practices, funds indicated that they became more likely to conform to best practices.[94] For example, rather than publicly disclose that the fund lacked a compliance officer or was not audited, some fund managers hired a compliance officer[95] and/or an auditor. The desire to conform to best practices was heightened by the fact that potential investors had easy access to the information. Rather than requesting governance information from the fund, potential investors could access the information online in mere seconds.

Second, many respondents indicated that chief compliance officers enjoyed increased status following SEC regulation. Some funds appointed

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[94] Such behavioral changes are consistent with the effects of disclosure in other contexts. *See, e.g.*, Linck, *supra* note 15 (the requirement that public companies disclose whether a "financial expert" sits on the company's audit committee led to a doubling of the number of those "experts" on audit committees); Aaron Chatterji & Michael Toffel, *How Firms Respond to Being Rated*, 31 STRAT. MGMT. 917 (2010) (public disclosure of firms' poor environmental records led those firms to subsequently improve their performance).

[95] The funds that became subject to the SEC's enforcement authority were required to have a compliance officer. However, the disclosure-only firms were exempt from this requirement—they were only required to indirectly disclose whether they had such an officer. In this regard, the disclosure-only approach is similar to the "comply or explain" regime that is frequently used by European regulators.

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compliance officers for the first time. And funds that already had compliance officers were often thought to place a greater value on the officer's input following regulation. Notably, mandatory governance disclosures may have benefitted compliance officers, because the officers were able to easily identify the governance structures of competitors and use that information to push for change within their own organizations.

2. Changes in audit procedures and misreporting. In sum, anecdotal evidence suggests that the disclosure requirements decreased misreporting by spurring internal governance changes. These governance changes, in turn, reduced misreporting. Although this explanation is intuitive, it is difficult to test empirically because very little information is available on funds' internal governance prior to SEC regulation.

I do, however, have information on each fund's audit history.[96] Using this information, I identified the funds that initiated audit procedures following regulation (i.e., I identified funds that were not audited by an independent public accountant before regulation but hired an independent auditor following the imposition of mandatory regulation). I then tested whether the funds that initiated audit procedures following regulation had greater decreases in misreporting than funds that did not change their audit procedures.

The results, shown in Figure VIII[97] below, support the theory that the decrease in misreporting following regulation was driven by changes in governance. Following the Hedge Fund Rule, the funds that initiated audit procedures triggered roughly 0.34 fewer flags than would have been

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[96] The commercial databases are largely focused on funds' financial performance, not governance. However, the Lipper Hedge Fund database includes a field noting the last official audit date for each fund.

[97] Figure VIII reflects coefficients for the interaction terms presented in the models in column C.1. of Tables V and VI.

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expected based on the control funds over the same period. By comparison, the change in misreporting at the funds that did not initiate audit procedures was not statistically different from the control funds. Although there is a similar pattern in the DFA setting, the results are far less pronounced: unlike the earlier setting, both groups of funds significantly decreased misreporting relative to the control funds.[98] It is not surprising, however, that even funds that did not initiate audit procedures reduced misreporting. Funds could have made any number of changes in internal governance, and it seems likely that many of the funds that did not initiate audit procedures made other unobservable changes in governance.[99]
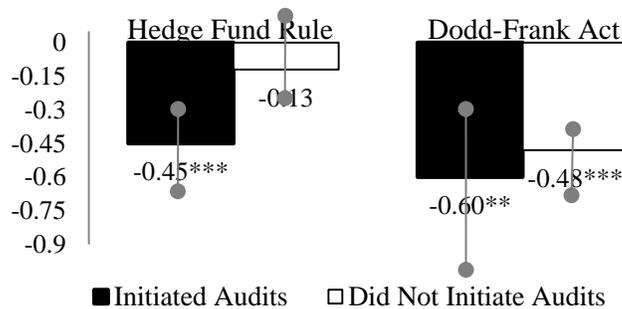
FIGURE VIII. CHANGES IN AUDIT PROCEDURES AND MISREPORTING

Although limited to only one change in governance, this analysis provides important empirical evidence that is consistent with the experience of practitioners: disclosure requirements led to changes in fund governance, and these changes in governance led to a decrease in misreporting. This finding provides strong evidence in favor of disclosure

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[98] In the DFA setting, the magnitude of the decrease in misreporting appears to be greater for the firms that initiated audit procedures. However, F-tests show that these coefficients are not significantly different from one another at standard levels of significance.

[99] It also seems likely that the decreases noted are not due exclusively to changes in auditing—the firms that initiate audits are likely to make additional governance changes that are unobservable.

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rules as a regulatory tool in this context. However, as discussed in the next Part, these results do not indicate that the regulatory design of securities law should consist solely of disclosure rules. Instead, my results suggest that, in the current regulatory environment for hedge funds, the marginal benefits of public investments in the development of disclosure rules may exceed the marginal benefits of investments in enforcement.

III. IMPLICATIONS

The evidence presented in this Article provides three important insights for lawmakers and commentators interested in the design of American securities law. First, my study refines the debate over hedge fund regulation by showing that regulation—and, in particular, rules mandating disclosure—reduced misreporting at hedge funds. Second, my evidence suggests that, in the context of hedge funds, additional improvements in the design and implementation of disclosure rules would be a more cost-effective means of reducing fraud than additional resources spent on enforcement. Third, to the extent that my results can be generalized beyond the hedge fund context, they initiate a conversation as to whether regulatory efficacy might benefit from increased focus on disclosure rules and less on enforcement efforts.

A. Hedge Fund Regulation and Misreporting

My findings show that hedge fund regulation reduced misreporting. This is good news because many commentators—including former SEC Commissioners and Chairmen of the Federal Reserve—have questioned whether hedge fund regulation could achieve such benefits.[100] Importantly, my study points to an important nuance in that debate:

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[100] *See supra* note 8 and sources cited therein (noting that Alan Greenspan expressed disbelief that hedge fund regulation would reduce misreporting). *See also* Dissent, *supra* note 60 (noting that Paul Atkins and Cynthia Glassman expressed similar sentiments).

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meaningful study of the effects of a law's design requires separate evaluation of its different regulatory components, because one may be effective even if another is not.

In one sense, my findings are consistent with concerns regulators have expressed regarding mandatory hedge fund regulation. Critics of such regulation have generally focused on the relative costs and benefits of enforcement, and have provided significant reason to doubt that examinations actually reduce fraud.[101] Even the SEC has questioned the effectiveness of its own examination program, noting in 2011 that it "believes that the Commission likely will not have sufficient capacity in the near or long term to conduct effective examinations of registered investment advisers with adequate frequency."[102]

Consistent with the intuition that SEC compliance examinations provide limited value for investors, I find no evidence that examinations, or the threat of examinations, reduce misreporting at hedge funds.[103] By contrast, I show that the imposition of mandatory disclosure rules—a

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[101] These critics have highlighted many challenges faced by federal enforcement officials, including the relative inexperience of SEC staff in comparison to the advisors they oversee and the limited frequency of examinations. *See, e.g.,* Paul S. Atkins, *Protecting Investors Through Hedge Fund Advisor Registration: Long On Costs, Short On Returns*, 25 ANN. REV. BANKING & FIN. L. 537, 544-46 (2006).

[102] STAFF OF THE INVESTMENT ADVISER REGULATION OFFICE DIVISION OF INVESTMENT MANAGEMENT, SEC, STUDY ON ENHANCING INVESTMENT ADVISER EXAMINATIONS 38-39 (Jan. 12 2011).

[103] Although the absence of evidence that the current enforcement regime reduces misreporting is important, I note that my study provides limited insight as to *why* enforcement does not appear to reduce misreporting. In particular, I cannot distinguish whether I find no change in misreporting because enforcement examinations are not effective, *ex post*, at detecting existing fraud, because hedge funds, *ex ante*, expect them to be ineffective, or because these *ex ante* and *ex post* effects both contribute to funds' apparent indifference to enforcement efforts.

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potentially cheaper alternative to enforcement efforts—can reduce misreporting. Thus the results of my study provide doubly good news: not only can hedge funds be regulated effectively, but such regulation can be accomplished relatively cheaply by focusing on disclosure.

To be sure, my evidence does not show that the *net* social-welfare effects of hedge fund regulation are positive. Critics have pointed to significant costs to such regulation,[104] and the benefits identified here may not outweigh these costs. However, this Article provides initial empirical evidence on the benefits of disclosure to hedge fund investors.

B. Allocation of Limited Regulatory Resources

A second implication of my study is that, at least in the context of hedge funds, additional investments in the design and implementation of disclosure rules are likely to be more cost-effective than resources spent on enforcement. Although a great deal of prior work has studied public-company governance,[105] there is very little research on the optimal regulatory design for addressing agency costs at hedge funds and other investment advisors. The relative paucity of work in this area is concerning for at least two reasons. First, investment advisors now oversee trillions of dollars in wealth, making the design of the law that governs their activities an increasingly pressing question. Second, many of these advisors only recently became subject to mandatory federal regulation, and lawmakers are now in need of analysis that can help them design the contours of investment-advisor regulation in the United States.

My study provides an empirical basis for regulation in this area and shows that hedge funds respond significantly to the imposition of

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[104] *See* Atkins, *supra* note 101.

[105] *See, e.g.,* Gompers et al., *supra* note 37. *See also* Bebchuk et al., *supra* note 14.

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mandatory disclosure requirements.[106] Although the federal disclosure rules I study here marked a very significant increase in disclosure—indeed, most unregulated funds did not disclose any public information prior to these changes in law—the results of my study are striking, particularly when one considers that there are serious flaws in the current disclosure regime governing investment advisors. Especially in light of the significant resource limitations facing regulators in this area,[107] my study suggests that regulators may best serve investors by emphasizing disclosure rules and fixing flaws in the current regime. In particular, I suggest that lawmakers consider the following three reforms.

First, the SEC should improve access to Form ADV, the federal disclosure that I study here. Until recently, the SEC refused to make historical Form ADV data publicly available, and even now complete information is not made available without a FOIA request.[108] Regulators could make federal disclosure law even more effective by giving investors complete and low-cost access to this information.

Second, my engagement with Form ADV during the course of this study makes clear that these filings are rife with inaccuracies.[109] Such

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[106] For theoretical explanations as to why hedge funds' sensitivity to disclosure may differ from that of public corporations, *see infra* Part III.C.

[107] As noted by Mary Schapiro, SEC Chairwoman during the implementation of the DFA rules studied here, the SEC's budget constraint "is a strain that is already having an impact on our core mission". Jim Puzzanghera, *SEC Chief Warns Against Budget Cuts* L.A. TIMES (Feb. 4, 2011).

[108] The SEC provides limited historical Form ADV data online. Archive, *supra* note 1. However, these data are notably low-quality. Although the SEC now provides more complete historical data in response to FOIA requests, this is a recent change in policy. *See* William Cohan, *SEC Raises Barrier to Disclosure of Information*, N.Y. TIMES (Nov. 4, 2014).

[109] The particular field that I used for this study—whether the fund was subject to federal disclosure and/or enforcement rules at each point in time—was populated by regulators

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inaccuracies may be undermining the efficacy of the disclosure, and suggest that regulators might be able to enhance the effects uncovered here simply by investing resources in ensuring that disclosures are more accurate.[110]

Third, the SEC should expand existing disclosure rules to require investment advisors to disclose detail on the risk that their assets are mispriced. Some assets, like shares of public-company stock, are straightforward to value. Others, like mortgage-backed securities, are very difficult to value. Managers necessarily have more discretion when pricing assets that are more difficult to value, and prior studies have shown that managers use that discretion opportunistically.[111] This is precisely the type of agency-related information that should be required to be disclosed on Form ADV. In particular, advisors should be required to disclose whether the manager or an external third party performs the pricing.[112]

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and did not have noticeable errors. However, there were clear errors in fields populated by the advisory firms. In particular, it was clear that advisors were not updating the form throughout the year to reflect material changes, as they are required to do. While the discovery of some errors during a close review of disclosures of this type is to be expected, the frequency and magnitude of the errors I found was unusually high.

[110] The SEC has recently received, and apparently considered, similar advice in the public-company context. *See* Lucian Bebchuk et al., *Pre-Disclosure Accumulations by Activist Investors: Evidence and Policy*, 39 J. CORP. L. 1 (2013) (arguing that regulators considering changes to the rules governing disclosure of large blocks of public-company stock should focus on the 10% of investors who do not follow existing rules) (SEC, *SEC Announces Charges Against Corporate Insiders for Violating Laws Requiring Prompt Reporting of Transactions and Holdings* (Sept. 10, 2014)).

[111] For evidence that managers use discretion to report more favorable financial results*, see* Gavin Cassar & Joseph Gerakos, *Hedge Funds: Pricing Controls and the Smoothing of Self-reported Returns,* 24 REV. FIN. STUD. 1698 (2011); J. Richard Dietrich et al., *The Reliability of Investment Property Fair Value Estimates,* 30 J. ACCT. ECON. 125 (2001).

[112] Consistent with intuition, the funds in which the manager performs the pricing have more misreporting. Cassar & Gerakos, *supra* note 111. The manager has full discretion to determine the prices of positions in almost 20% of funds. *See id.*, at 1702-04.

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To be clear, I do not intend to suggest that the existing enforcement regime for investment advisors adds no value—only that my evidence indicates that the marginal benefit of an investment in disclosure is greater than that of public enforcement. One explanation for this result is that hedge funds, regardless of whether they are subject to federal regulation, are already subject to a relatively high level of public enforcement from other legal institutions. For example, state securities agencies,[113] FINRA,[114] the CFTC,[115] and foreign regulators[116] all play a role in hedge fund enforcement. Even the SEC can and does conduct "for-cause" examinations of hedge funds that are not subject to its enforcement oversight more generally.[117] And there are many sources of enforcement that do not come from governmental institutions; private parties, for example, play a significant role.[118]

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[113] State securities agencies can and do regulate advisory firms operating within their state, regardless whether the firm is regulated by the SEC. *See, e.g.*, Gretchen Roin, *Understanding the Investment Adviser Regulatory Scheme*, LAW360 (July, 31, 2014).

[114] Investment advisors with an associated broker-dealer can become subject to FINRA oversight because FINRA monitors broker-dealers. FINRA examinations focus on the broker-dealer business rather the advisory business, but can unearth concerns with the advisory business as well. *See* Testimony Before the Subcommittee on Oversight and Investigations Committee on Financial Services, 112th Cong. (May 13, 2011) (statement of Richard G. Ketchum, Chairman and Chief Executive Officer, FINRA).

[115] The CFTC regulates a subset of hedge funds. *See* Letter from Sharon Hruska, Acting Chairman, CFTC, to William Donaldson, Chairman, SEC 1-2 (Oct. 22, 2004).

[116] Some funds are also subject to oversight from foreign regulators. *See, e.g.,* DOUGLAS CUMMING, NA DAI, & SOFIA JOHAN, HEDGE FUND STRUCTURE, REGULATION, AND PERFORMANCE AROUND THE WORLD 37-68 (2012).

[117] *See* ABROMOVITZ, *supra* note 32, at 23-24. The SEC conducts cause examinations of unregulated funds (by contrast, compliance exams and special purpose reviews only occur for regulated funds). *Id.* The SEC's authority stems from the antifraud provisions of the IAA, which extend to regulated and unregulated advisors. 15 U.S.C.S. § 80b-6.

[118] My empirical analysis also does not address the possibility that enforcement could be designed to be more effective. Although there are simple steps that could be taken to improve enforcement, such as refining the analysis used to determine whether an advisor

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In light of these alternative sources of enforcement, it may be unsurprising that empirical analysis of federal lawmaking in this area shows far greater marginal benefits from disclosure than enforcement. In sum, my findings suggest that policymakers seeking to maximize investor protection and minimize cost should focus on disclosure.

C. Lessons for Securities Law

The evidence presented here is limited to the context of hedge funds. Nevertheless, because so much previous work has emphasized agency costs in the public-company context, I briefly consider potential implications for public corporations as well. To the extent that my results can be generalized to public companies, they provide empirical support for the agency theory of disclosure, suggesting that regulatory efficacy might benefit from increased focus on disclosure rules and less on enforcement efforts. I note, however, that a great deal of caution is warranted in attempting to generalize the results from my work on hedge fund regulation to the public-company context for at least three reasons.

First, because hedge fund investors are thought to be able to exit their investments more easily than public-company shareholders,[119] some

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is deemed high-risk, I note that hedge fund accounting is highly specialized, making it difficult for the SEC to recruit individuals with sufficient expertise to identify misreporting without incurring very significant expense.

[119] The hedge funds I study here are generally open-end funds with no or limited lock-up periods, meaning that their investors have the right to redeem their shares based on the funds' net asset value with limited obstruction. Thus, investors can credibly threaten to withdraw their investment at its actual net asset value at any point in time. By contrast, a shareholder at a public corporation who wishes to sell her shares due to, for example, concerns with management will have to sell those shares on the open market at a lower price that reflects those concerns. *See* Lucian Bebchuk, *Federalism and the Corporation: The Desirable Limits on State Competition in Corporate Law*, 105 HARV. L. REV. 1435 (1992).

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have argued that hedge fund investors have far more negotiating leverage with managers than public-company shareholders.[120] This negotiating power could make disclosure a more effective accountability mechanism at hedge funds than at public companies because fund managers, knowing they are constantly at risk of losing their investment, may be more responsive to investor sentiment than public-company managers.

Second, the investor base at hedge funds differs from that at public companies. A higher fraction of hedge fund investors are sophisticated institutional investors, and nearly all individual investors in hedge funds are wealthy.[121] Hedge funds also have fewer shareholders than do public companies.[122] This relatively concentrated ownership by sophisticated investors suggests that these investors may be more likely to use the disclosures in question[123] and may suffer from fewer coordination

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[120] As John Morley and Quinn Curtis have pointed out, this relative ease of exit could cut the other way: since investors in hedge funds can exit easily, they may have little incentive to lobby for management changes and choose instead to reallocate their funds to better-governed advisors. *See* Morley & Curtis, *supra* note 20. Importantly, those authors focus on mutual funds rather than the hedge funds studied here. Their premise, however, suggests that the findings described in this Article are all the more significant.

[121] Hedge funds are commonly defined as funds that utilize the exemptions found in either Section 3(c)(1) or Section 3(c)(7) of the Investment Company Act of 1940. *See* 15 U.S.C. § 80a-3(c)(1) and (7) (2015). All investors in such funds must be, at a minimum, "accredited investors" as defined by the SEC's Regulation D, 17 C.F.R. § 230.501(a) (2015) (generally requiring individuals to have at least $1 million in net worth, or a $200,000 annual salary, to qualify as an "accredited investor").

[122] Most funds seek to avoid the costs of Exchange Act regulation. To do so, the funds must have fewer than 2,000 investors. *See* Section 12(g) and Section 15(d) of the Exchange Act (recently updated by the Jumpstart Our Business Startups Act).

[123] Not only are sophisticated institutions more likely to access financial disclosures than, for example, retail investors, but empirical evidence suggests that they are better able to process the information. *See, e.g.,* Huang et al., *Institutional Trading around Corporate News: Evidence from Textual Analysis* (May 30, 2014).

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problems than public-company shareholders.[124] The greater expected use of disclosure, and the heightened possibility of shareholder coordination, may lead disclosure to be more effective in hedge funds than in the public-company context.

Third, enforcement mechanisms differ significantly between public corporations and hedge funds. For example, shareholder litigation at public corporations is notoriously commonplace and occurs much more frequently than at hedge funds.[125] Thus, differences in the baseline level of disclosure and enforcement may cause the effect of additional disclosures to be different in the public-company context than for hedge funds.[126]

In sum, my evidence indicates that regulation, and particularly the imposition of mandatory-disclosure rules, has significantly reduced misreporting at hedge funds. While my focus on hedge funds provides a valuable and unique setting for empirical analysis, that setting also imposes significant questions as to the extent to which these findings can be generalized to other contexts. Further work is needed to determine whether a comparable setting would reveal results at public companies that are consistent with the findings that this Article describes for hedge funds.

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[124] *See, e.g.*, WILLIAM T. ALLEN, REINIER KRAAKMAN, AND GUHAN SUBRAMANIAN, COMMENTARIES AND CASES ON THE LAW OF BUSINESS ORGANIZATION 102 (4th ed. 2009) (describing the well-known collective-action problems in the public-company context).

[125] *See* Meyers, *supra* note 22.

[126] *See, e.g.,* Barth & Israeli, *supra* note 54. A fourth potential difference between the hedge fund and public-company contexts is that enforcement in the latter case addresses important values that are not so squarely at issue in the former. It may be, for example, that enforcement efforts addressing fraud at public companies gives investors confidence in the functioning and fairness of markets that would not be conveyed by enforcement against hedge fund fraud.

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IV. CONCLUSION

The optimal regulatory design for reducing agency costs has long been a focus of business law. However, while a great deal of theoretical work has considered this issue, empirical work has been confounded by the fact that regulators generally make changes in both the laws of disclosure and enforcement at the same time. This fact prevents empirical analysis from determining whether the outcomes we see should be attributed to changes in the law of disclosure, enforcement, or both. Moreover, previous work on this topic has focused on public corporations, saying little about optimal regulatory design at the investment advisors that oversee the deployment of trillions of dollars in American wealth.

In this Article, I examined these questions using a unique setting offered by repeated recent changes in the law governing hedge funds. I have shown that the imposition of regulation reduced agency costs at hedge funds, and I have provided evidence that this decrease was driven by the imposition of mandatory disclosure. Importantly, my study shows that an increase in mandatory disclosure, even without a corresponding change in enforcement intensity, can reduce agency costs at hedge funds.

The Article offers three important implications for lawmakers now considering the optimal design of securities law. First, my results show that hedge fund regulation has reduced agency costs in the form of misreported financial results. Second, the evidence indicates that disclosure, not enforcement, is the primary mechanism that has driven the decrease in agency costs. This result suggests that lawmakers with limited resources should focus on the design and implementation of disclosure requirements, rather than investments in enforcement, when regulating hedge funds. Finally, to the extent that my findings can be extended to public corporations—and, to be sure, there may be reasons to question that premise—they suggest that lawmakers would do well to focus on mandatory disclosure rules in the regulation of public companies.

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APPENDIX

I compiled the dataset used in this Article by merging several underlying databases. The information on hedge funds' financial performance, such as monthly returns, was obtained from the Thomson Reuters Lipper Hedge Fund Database (also known as the Trading Advisor Selection System (TASS) database).[127] I separately filed seventeen FOIA requests for historical Form ADV filings at both the state and federal levels in order to obtain information about the level of regulation that each fund was subject to throughout my sample period.[128]

I. MISREPORTING

A. Calculations for Measures of Misreporting

As explained in the Article, I use three measures to identify "flags" for misreporting. [129] The measures examine: (1) whether there is a "spike" in the number of returns above zero, (2) whether the fund uses "cookie

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[127] TASS is a commercial database that has been used frequently in academic literature, and is available through Wharton Research Data Services. *See, e.g.,* Agarwal et al., *supra* note 71; Stephen Brown et al., *Mandatory Disclosure and Operational Risk: Evidence from Hedge Fund Registration,* 63 J. FIN. 2785 (2008).

[128] I filed 16 requests at state securities agencies (CA, CO, CT, FL, GA, IL, MA, MD, MN, NJ, NY, OH, PA, TX, VA, and WA) and one at the SEC. I selected the states by tabulating the percentage of SEC registrants located in each state and submitting FOIA requests in all states with 2% or more of the total advisors. I received Form ADV filings for all SEC registrants from 2001-2014 and some Form ADV data for state registrants from 2006-2014. Form ADV is filed by the investment advisor, but the Lipper Database is recorded at the fund level. As such, I performed a one-to-many merge to combine these databases because one investment advisor may be associated with multiple hedge funds.

[129] Only 10-15% of the funds had a significant spike at zero or deviated from Benford's distribution, but more than 25% of the funds triggered the flag for cookie jar accounting.

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jar" accounting, and (3) whether the first digits of the reported returns conform to Benford's Law. Because these proxies are critical to my analysis of misreporting, I provide additional detail as to how I calculated these flags below.

1. Spike at Zero. To calculate whether there are statistically significantly fewer observations just below zero than would be expected based on the surrounding observations, I create three bins of 50 basis points each. The first bin includes monthly returns from -1% to -.50%, the second from -.50% to 0%, and the third from 0% to .50%.[130] I then test whether the number of observations in the bin just below zero is less than expected based on the average of the two surrounding bins. I calculate statistical significance by following prior literature,[131] and I consider the fund to have misreported if the number of observations just below zero is statistically lower than expected with a significance level of 5% or greater.

2. "Cookie jar" accounting. I test for "cookie jar" accounting by examining whether the fund reports abnormally high December returns. To determine whether a fund reports abnormal December returns, I regress each fund's monthly returns on the seven hedge fund style factors used in prior literature,[132] an indicator for the month of December, and year fixed effects. The seven hedge fund factors are included in order to control for general economic factors that may affect hedge fund returns. I consider the fund to have misreported if the December dummy variable is significantly positive at the 5% level or greater.

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[130] By using a bin width of 50 basis points, I follow the fund-specific measure of discontinuity in Bollen & Pool, *supra* note 42, at 2273-74. All bins include the upper limit. For example, the second bin includes 0.

[131] *See* Burgstahler & Dichev, *supra* note 42, at 103.

[132] *See* William Fung & David Hsieh, *Hedge Fund Benchmarks: A Risk-Based Approach*, 60 FIN. ANALYSTS J. 65 (2004). All regressions use robust standard errors.

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3. Benford's Distribution. To test whether a firm deviates significantly from the distribution predicted by Benford's Law, I use the Kolmogorov-Smirnov (KS) statistic. The KS test is a nonparametric test that relies on the maximum deviation from the expected distribution, where the maximum deviation is determined by the cumulative deviation at each digit.[133] I consider a fund to have deviated from Benford's Law if the maximum deviation is significant at the 10% level.[134]

B. Relevance of Benford's Law

As explained above, one of my measures of misreporting is based on conformance with Benford's Law. Although Benford's Law has been used to identify financial abnormalities in other contexts, I am not aware of any instances in which it has been used to identify misreporting at hedge funds. To confirm the relevance of Benford's Law in this context, I ran the following preliminary analysis.

First, as a general rule, Benford's Law will apply when the distribution of the base-10 log values of the original dataset is smooth, symmetrical, and spread across several orders of magnitude in the log scale.[135] Thus, if I take the base-10 log values of my returns data and the resulting distribution resembles something akin to a normal or uniform distribution ranging across several orders of magnitude, Benford's Law will apply.

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[133] For the seminal account of the KS statistic in the original Russian, *see* N.V. Smirnov, *Estimate of Deviation Between Empirical Distribution Functions in Two Independent Samples,* 2 BULL. MOSCOW U. 3 (1939).

[134] The critical value for the 10% threshold is calculated as $1.22\sqrt{N}$.

[135] *See* Amiran et al., *supra* note 47.

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         To determine whether hedge fund returns meet these criteria, I graphed the distribution of the base-10 log monthly returns.[136] This distribution is presented in Figure IX. As the Figure shows, the distribution is approximately normally distributed and ranges across several orders of magnitude. This means the distribution will largely conform to Benford's Law.
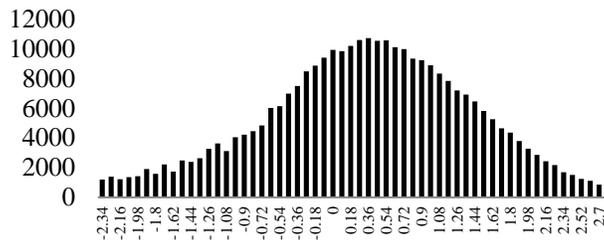
FIGURE IX. DISTRIBUTION OF LOG$_{10}$ |MONTHLY HEDGE FUND RETURNS|

         Second, having confirmed that the distribution will largely conform to Benford's Law, I identified whether deviations from the Law are correlated with fraud by hand-collecting SEC accounting-related enforcement actions against hedge funds[137] from 2004-2011 and testing whether these "fraud funds" were more likely to deviate from Benford's Law than the non-fraud population. Upon matching the subset of fraud

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[136] I use the absolute value of monthly returns so that negative returns are included. The bin width is 0.09, calculated in accordance with the optimal bin width formula described in SILVERMAN, *supra* note 43.

[137] SEC enforcement actions are widely used to validate empirical proxies for fraud. *See, e.g.,* Bollen & Pool, *supra* note 41. However, they are an imperfect measure because they capture only a small, non-random subset of total fraud. *See, e.g.,* James Cox et al., *SEC Enforcement Heuristics: An Empirical Inquiry,* 53 DUKE L. J. 737, 775-77 (2004); Simi Kedia & Shivaram Rajgopal, *Do the SEC's Enforcement Preferences Affect Corporate Misconduct?,* 51 J. ACCT. ECON 257 (2011).

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funds to the TASS hedge fund database, I found that all but one stopped reporting during or immediately after the period in which the fraud occurred. Thus, I tested for deviations from Benford's Law over the final thirty months of each fund's reporting life.

Only twenty-two of the fraud funds had thirty months of data available, but 32% of these funds significantly deviated from Benford's Law over their final thirty months. By comparison, 18% of the non-fraud funds deviated over the same period.[138] Despite the small number of "fraud funds," this difference is statistically significant at the 10% level. To be sure, more work is needed to fully validate the use of Benford's Law in this context, but these steps provide an initial framework for using this as one of my three measures of misreporting.

II. METHODOLOGY

To ensure that all of the results presented in the Article are comparable, all tests use the following standardized methodology. First, I identified the treatment and control samples as follows. If a fund was continually subject to federal disclosure and enforcement oversight during the 60-month period surrounding the relevant change in law,[139] I included it in the control sample. If the fund submitted to federal oversight in the

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[138] I found that these results were robust, and often stronger, when I compared the fraud funds to the non-fraud funds over alternative time periods.

[139] For the Hedge Fund Rule and DFA, I use the date the SEC adopted the final rule in question as the date of the change in law. These dates are Dec. 2004 and June 2011 for the Hedge Fund Rule and the DFA, respectively. *See* HF Rule*, supra* note 31. *See also* Rules Implementing Amendments to the Investment Advisers Act of 1940, 76 Fed. Reg. 42,950, 42,963-64, 42,982 (July 19, 2011) (to be codified at 17 C.F.R. pts. 275 & 279). For the *Goldstein* case, I use the month in which the first funds in my data withdrew from federal oversight, Sept. 2006, as the date of the relevant change in law.

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six months prior to the deadline required by the relevant law,[140] I considered it to have become subject to federal oversight in accordance with the change in law—and, thus, I included in the treatment sample.

Second, to ensure that I had sufficient observations for each fund to identify misreporting, I required each fund included in my sample to have thirty months of observations both before and after the relevant change in law. To avoid bias due to attrition, all firms lacking the requisite thirty months of data in each period were dropped from the sample. Third, control variables and fixed effects were included in all tests.[141] Finally, all standard errors were clustered by fund.

There were more control funds than treatment funds in all of the analyses described below. In the analysis of the Hedge Fund Rule, there were 228 control funds and 124 treatment funds. In the analysis of the D.C. Circuit's decision in *Goldstein,* there were 289 control funds, 55 funds that elected to exit the federal regulatory regime, and 102 funds that

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[140] Funds were required to submit to SEC oversight by Jan. 31st, 2006 and by March 31st, 2012 for the Rule and the DFA, respectively, so this period ranges from Aug. 2005–Jan. 2006 for the Hedge Fund Rule and from Oct. 2011–Mar. 2012 for the DFA. *See id.* and sources cited therein. Funds that do not meet the criteria of either the treatment or control sample were dropped from the analysis.

[141] The results are shown first with fixed effects for fund characteristics (i.e., fixed effects for the fund's style and country of incorporation) and then with fund fixed effects. All models controlled for the fund's mean monthly return, mean log of net asset value, and mean age over the period. I also controlled for the number of months audited over the period, the fund's return volatility over the period, whether the fund was incorporated in the US, and the sensitivity of the fund to market liquidity. The fund's sensitivity to liquidity was measured by regressing the fund returns over each period on the Sadka permanent liquidity variable. The resulting beta on the Sadka variable was then included in my regressions as a control. *See* Ronnie Sadka, *Momentum and Post-Earnings-Announcement Drift Anomalies: The Role of Liquidity Risk,* 80 J. FIN. ECON. 309 (2008).

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elected to remain subject to that regime.[142] Finally, in the analysis of the DFA, there were 552 control funds and 222 treatment funds.[143] As noted previously,[144] there were significant differences between the treatment and control funds across several observable characteristics, leading to concerns that there may be differences in unobservable characteristics as well. I address concerns related to differences in the treatment and control samples in robustness tests described below.

Finally, I note two methodological limitations to my analysis. First, because I studied the change in misreporting at the funds newly subject to federal oversight, I omitted funds that evaded the federal regulatory regime.[145] As voiced by Alan Greenspan, evasion is a particular concern for hedge funds. Because Greenspan specifically noted that hedge funds are highly mobile and may relocate to avoid regulation,[146] I reviewed

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[142] The total number of observations in the analyses of the Hedge Fund Rule and *Goldstein* tests differed slightly because of data availability in TASS.

[143] Of these 222 treatment funds, 108 were newly subject to both disclosure and enforcement (the others were disclosure-only or enforcement-only funds). Out of an abundance of caution, I omitted from Table II all 20 funds that withdrew from federal oversight after *Goldstein* to ensure that the initial set of tests compared only newly regulated funds across all three settings. I note, however, that I included these 20 funds in Table IV and the results are consistent with those reported in Table II.

[144] *See supra* Part II.C.3. Relative to the control sample, the treatment funds were significantly younger, more likely to be foreign, had better performance, and had greater return volatility.

[145] Prior work has found evidence that firms often evade mandatory federal regulation. *See, e.g.*, Leuz et al., *Why Do Firms Go Dark? Causes and Economic Consequences of Voluntary SEC Deregistrations,* 45 J. ACCT. ECON. 181 (2008) (finding that firms were more likely to "go dark" in order to opt out of the Sarbanes-Oxley Act); Leuz & Bushee, *Economic Consequences of SEC Disclosure Regulation: Evidence from the OTC Bulletin Board,* 39 J. ACCT. ECON. 233 (2005) (finding that some firms left the OTC bulletin board rather than submit to increased reporting requirements).

[146] *See* Greenspan, *supra* note 6.

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historical data to ascertain whether funds relocated around the time of the legal changes. Although I found no evidence that funds engaged in systematic relocation to avoid regulation, I cannot rule out the possibility that funds may have opted out of the regulation using other means.[147]

Second, I do not consider whether these changes affected managerial behavior at funds that were *already* subject to federal oversight. It is theoretically possible that misreporting at these funds increased because, after the legal change, regulators were more resource-constrained than before the change.[148] Testing this conjecture is difficult,[149] but my analysis does provide limited evidence that the control funds had greater levels of misreporting after the changes of law than before. This result, however, is not robust.[150] Moreover, I do not focus on this possibility because my analysis emphasizes whether changes in law reduced misreporting—not the overall consequences of those changes in law. Nevertheless, this possibility deserves attention in future work.

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[147] For example, in certain circumstances, funds could evade these changes in law by altering the "lockup" period that investors must observe before withdrawing their funds. For a description of these "lockup" periods and how such evasion can be accomplished, *see* Aragon, et al., *Onshore and Offshore Hedge Funds: Are They Twins?,* 60 MGMT. SCI., 74 (2014). I note, however, that this study found that only 0.5% of domestic funds and 2% of offshore funds changed their lockup periods to evade the Hedge Fund Rule.

[148] Prior work has considered the so-called "constrained cop" theory in which firms are more likely to misbehave when they expect the regulator to be distracted. *See, e.g.*, Kedia & Rajgopal, *supra* note 137, at 260-64 (describing these studies).

[149] Misreporting varies over time, necessitating the use of a control group to examine this question. There is, however, no obvious control group that was *not* subject to these legal changes (foreign funds are a poorly suited control in this context; *see supra* note 74).

[150] The Post variable is significantly positive in four of the models examining the Rule (Table I) and three of the models examining the DFA (Table II), but disappears entirely in the propensity score matched samples for the DFA. *See infra* notes 155-59.

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III. ANALYSIS

Below I present the results of the regression analysis summarized in Part II of the Article. All regression tables include six models. The dependent variable in the first two columns is a dummy variable equal to one if the fund triggered any flag for misreporting and zero otherwise.[151] The dependent variable in the last four columns is equal to the number of flags for misreporting triggered, which ranges from zero at the funds that did not trigger any flags to three at the funds that triggered all flags.

A. The Effect of Hedge Fund Regulation on Misreporting

1. Imposition of federal regulation. Tables I and II present the results of difference-in-differences regressions utilizing the Hedge Fund Rule and the DFA, respectively. Both tables use the equation below. The Post variable is set to one in the period after the rule was adopted and to zero in the period before. The New Fund variable is a dummy set to one for all treatment funds (i.e., the funds that became newly subject to federal oversight following the change in law) and to zero for all control funds. The variable of interest is the interaction term between these two variables. This term reflects the change in misreporting for the treatment funds relative to the control funds after mandatory regulation was adopted.

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[151] Due to concerns of bias in logit models with fixed effects and interaction terms, I present the results for the binary dependent variable using ordinary least squares rather than logit analysis. However, consistent with prior research, unreported tests indicate that the magnitude of the decrease in misreporting is similar across both estimation methods. *See e.g.*, Ottar Hellevik, *Linear Versus Logistic Regression When the Dependent Variable is a Dichotomy,* 43 QUAL. QUANT. 59 (2009). Additionally, the New Fund variable—and all derivatives thereof, such as the Remain and Withdraw variables in Table III—is omitted from the regressions using fund fixed effects, because the New Fund dummy is collinear with the fund fixed effects.

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$$Dep.Var. = \alpha + \beta_1 Post + \beta_2 New + \beta_3 Post * New + Controls + Fixed\ Effects + \varepsilon$$

	(A) Any Flag (OLS)		(B) # Flags (Ordered Logit)		(C) # Flags (OLS)	
Post	0.137**	0.121	0.783***	1.369*	0.229***	0.232
	(0.0528)	(0.122)	(0.248)	(0.741)	(0.0701)	(0.152)
New Fund	0.193***		0.829***		0.180***	
	(0.0565)		(0.266)		(0.0653)	
Post * New Fund	-0.202***	-0.187*	-1.011***	-1.692**	-0.262***	-0.221*
	(0.0723)	(0.109)	(0.329)	(0.700)	(0.0896)	(0.134)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Char.	Fund	Char.	Fund	Char.	Fund
Observations	722	704	722	704	722	704
(Pseudo) R2	0.134	0.577	0.0888	0.498	0.142	0.597

TABLE I. MISREPORTING AND THE HEDGE FUND RULE

	(A) Any Flag (OLS)		(B) # Flags (Ordered Logit)		(C) # Flags (OLS)	
Post	0.008	0.163**	0.0212	1.19***	-0.0043	0.169*
	(0.0347)	(0.0775)	(0.150)	(0.425)	(0.0443)	(0.0978)
New Fund	0.22***		0.88***		0.26***	
	(0.0512)		(0.214)		(0.071)	
Post * New Fund	-0.39***	-0.32***	-1.67***	-2.64***	-0.459***	-0.39***
	(0.0670)	(0.0994)	(0.295)	(0.662)	(0.0848)	(0.129)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Char.	Fund	Char.	Fund	Char.	Fund
Observations	1,316	1,316	1,316	1,316	1,316	1,316
(Pseudo) R2	0.124	0.579	0.0811	0.476	0.125	0.584

TABLE II. MISREPORTING AND THE DODD-FRANK ACT

As shown in the tables above, the interaction term is negative and statistically significant in all models, indicating that the treatment funds decreased misreporting relative to the control funds after regulation was mandated. On average, the likelihood that a treatment fund would trigger at least one flag for misreporting decreased by roughly 20% after the adoption of the Hedge Fund Rule (relative to the expectation set by the control funds) and by roughly 35% after the adoption of the DFA (again, relative to the control funds). Additionally, the average number of flags triggered by the treatment funds decreased by roughly 0.25 after the

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adoption of the Hedge Fund Rule and by roughly 0.40 after the adoption of the DFA (again, both decreases are relative to the expectations set by the control funds).

  2. *Removal of federal regulation.* Table III uses the *Goldstein* opinion to study the change in misreporting after mandatory regulation ceased. For this analysis, I build on the prior equation by partitioning the funds that became regulated in accordance with the Hedge Fund Rule using two dummy variables: Remain and Withdraw. Remain is set to one if the fund submitted to oversight in accordance with the Hedge Fund Rule and remained regulated, and Withdraw is to set one if the fund submitted to oversight in accordance with the Hedge Fund Rule and withdrew post-*Goldstein*.[152] Both are set to zero for the control funds. The Post variable is set to zero for the thirty months immediately prior to September 2006—the first month in which any of the funds withdrew after the SEC stated that it would not appeal the *Goldstein* opinion in August 2006—and to one in the thirty months after September 2006. The primary variable of interest is the interaction term between Post and Withdraw, which reflects the change in misreporting for the funds that withdrew after *Goldstein* relative to the change in misreporting for the control funds during the same period.

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[152] The SEC allowed all advisors that submitted to federal oversight in accordance with the Rule to withdraw through Jan. 31, 2007. *See supra* note 68. As such, I consider a fund to have withdrawn after *Goldstein* if it became subject to federal oversight after the Rule was promulgated, and then withdrew between August 2006 and Jan. 31, 2007.

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$$Flag(s) = \alpha + \beta_1 Post + \beta_2 Withdraw + \beta_3 Remain + \beta_4 Post * Withdraw + \beta_5 Post * Remain + Controls + Fixed\ Effects + \varepsilon$$

	(A) Any Flag (OLS)		(B) # Flags (Ordered Logit)		(C) # Flags (OLS)	
Post	-0.0876* (0.0456)	-0.182* (0.101)	-0.487** (0.224)	-1.658** (0.721)	-0.125** (0.0539)	-0.201* (0.110)
Withdraw	-0.210*** (0.0687)		-1.152*** (0.437)		-0.249*** (0.0867)	
Remain	-0.0964* (0.056)		-0.522* (0.297)		-0.118* (0.0665)	
Post * Withdraw	0.18** (0.0886)	0.195 (0.010)	0.976* (0.513)	1.850* (1.010)	0.20** (0.101)	0.230 (0.142)
Post * Remain	0.0929 (0.0680)	0.0714 (0.0949)	0.492 (0.369)	0.662 (0.802)	0.102 (0.0764)	0.0840 (0.108)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Char.	Fund	Char.	Fund	Char.	Fund
Observations	892	892	892	892	892	892
(Pseudo) R2	0.060	0.566	0.0472	0.550	0.065	0.602

TABLE III. MISREPORTING AFTER *GOLDSTEIN*

Table III shows that, post-*Goldstein,* the funds that withdrew from federal oversight increased misreporting relative to the control funds. The interaction term between Post and Withdraw is positive and statistically significant at 15% or better in all models. Although statistical significance in this table is lower than in the prior two tables, the treatment group has been partitioned into two groups, thereby reducing statistical power.

B. Disentangling Disclosure and Enforcement

To better understand the relative effects of disclosure and enforcement, I partition the funds that became subject to federal oversight following the DFA into three groups based on whether the fund was subject to an increase in disclosure, enforcement, or both. Using the equation below, Table IV shows the results of regressions examining the change in misreporting for each of the three categories. The time period and control variables are the same as those used in Table II.

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$$Flag(s) = \alpha + \beta_1 Post + \beta_2 Disc\&Enf + \beta_3 Disc. + \beta_4 Enf. + \beta_5 Post * Disc\&Enf$$
$$+ \beta_6 Post * Disc. + \beta_7 Post * Enf. + Controls + FixedEffects + \varepsilon$$

	(A) Any Flag (OLS)		(B) # Flags (Ordered Logit)		(C) # Flags (OLS)	
Post	-0.002 (0.034)	0.136* (0.075)	-0.037 (0.147)	0.97** (0.410)	-0.0195 (0.044)	0.133 (0.095)
Disc. & Enf.	0.23*** (0.051)		0.89*** (0.206)		0.27*** (0.069)	
Disc. Only	0.16*** (0.0610)		0.82*** (0.286)		0.25*** (0.0885)	
Enf. Only	0.0495 (0.324)		0.0554 (1.051)		-0.0228 (0.325)	
Post * Disc.& Enf	-0.41*** (0.0663)	-0.33*** (0.097)	-1.71*** (0.288)	-2.55*** (0.627)	-0.48*** (0.083)	-0.41*** (0.124)
Post * Disc. Only	-0.28*** (0.068)	-0.26*** (0.098)	-1.60*** (0.345)	-2.84*** (0.769)	-0.48*** (0.099)	-0.43*** (0.144)
Post * Enf. Only	-0.0461 (0.0319)	0.0814 (0.094)	-0.221 (0.140)	1.278 (0.976)	-0.0511 (0.041)	0.146 (0.138)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Char.	Fund	Char.	Fund	Char.	Fund
Observations	1,514	1,514	1,514	1,514	1,514	1,514
(Pseudo) R2	0.132	0.591	0.0924	0.485	0.157	0.606

TABLE IV. MISREPORTING AND TYPE OF REGULATION

The evidence in Table IV indicates that mandatory disclosure drives the reduction in misreporting. The funds subject to federal disclosure rules significantly decreased misreporting after the change in law, whereas the funds only subject to an increase in federal enforcement exhibited no significant change in misreporting relative to the control funds. Moreover, F-tests comparing the coefficients from Table IV confirm that the disclosure-and-enforcement funds and the disclosure-only funds had equivalent levels of misreporting prior to regulation and equivalent decreases in misreporting after regulation. Compared to the enforcement-only funds, however, both groups of funds subject to disclosure rules had significantly higher levels of misreporting prior to regulation and significantly greater decreases in misreporting following regulation in at least some of the models. The table provides important

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evidence that mandatory disclosure, even without a corresponding change in the level of enforcement, can reduce misreporting.

C. Changes in Audit Procedures and Misreporting

Anecdotal evidence suggests that the disclosure requirements did not reduce misreporting directly. Instead, the disclosure requirements spurred funds to make internal governance changes, and these governance changes reduced misreporting. This conjecture is difficult to test, because internal governance information is generally not available prior to regulation. However, my data indicate whether each fund was audited by an independent public accountant at each point in time, allowing me to determine whether a fund initiated audit procedures following regulation. I therefore partition the newly regulated funds into two groups: those that initiated audit procedures and those that did not. Tables V and VI examine these two groups using the equation below. The time period and control variables are the same as those used in Tables I and II.

$$Dep.Var. = \alpha + \beta_1 Post + \beta_2 Initiate + \beta_3 No\ Chg + \beta_4 Post * Initiate + \beta_5 Post * No\ Chg + Controls + Fixed\ Effects + \varepsilon$$

	(A) Any Flag (OLS)		(B) # Flags (Ordered Logit)		(C) # Flags (OLS)	
Post	0.129** (0.0529)	0.0916 (0.123)	0.752*** (0.249)	1.076 (0.759)	0.220*** (0.0702)	0.194 (0.154)
Initiate Audit	0.261*** (0.0745)		1.070*** (0.307)		0.247*** (0.0835)	
No Change in Audit	0.148** (0.0679)		0.642** (0.324)		0.132* (0.0767)	
Post * Initiate Audit	-0.336*** (0.0971)	-0.337** (0.145)	-1.625*** (0.422)	-3.069*** (0.889)	-0.447*** (0.112)	-0.421** (0.165)
Post * No Change	-0.109 (0.0884)	-0.0910 (0.130)	-0.567 (0.404)	-0.881 (0.797)	-0.133 (0.109)	-0.0923 (0.162)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Char.	Fund	Char.	Fund	Char.	Fund
Observations	722	722	722	722	722	722
(Pseudo) R2	0.139	0.587	0.0919	0.508	0.147	0.607

TABLE V. AUDITING AND THE HEDGE FUND RULE

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	(A) Any Flag (OLS)		(B) # Flags (Ordered Logit)		(C) # Flags (OLS)	
Post	0.00133 (0.0343)	0.142* (0.0748)	-0.0219 (0.146)	0.997** (0.405)	-0.0154 (0.0435)	0.137 (0.0940)
Initiate Audit	0.343** (0.159)		1.242* (0.641)		0.377* (0.215)	
No Change in Audit	0.194*** (0.0419)		0.866*** (0.189)		0.266*** (0.0602)	
Post * Initiate Audit	-0.623*** (0.175)	-0.630** (0.261)	-2.368** (1.059)	-4.019* (2.152)	-0.604** (0.286)	-0.598 (0.415)
Post * No Change	-0.338*** (0.0513)	-0.288*** (0.0728)	-1.659*** (0.239)	-2.751*** (0.525)	-0.482*** (0.0696)	-0.425*** (0.101)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Char.	Fund	Char.	Fund	Char.	Fund
Observations	1,514	1,514	1,514	1,514	1,514	1,514
(Pseudo) R2	0.132	0.590	0.0931	0.485	0.159	0.606

TABLE VI. AUDITING AND THE DODD-FRANK ACT

Tables V and VI support the theory that governance changes following regulation drove the decrease in misreporting. Following the Hedge Fund Rule, the funds that initiated audit procedures significantly decreased misreporting, whereas the funds that did not change their audit procedures did not have a significant change in misreporting relative to the control funds.[153] Although the pattern is less pronounced following the DFA[154]—indeed, the group of funds that initiated audit procedures and the group that did not both experienced statistically significant relative decreases in misreporting after regulation—this is not surprising. Funds can make any number of governance changes, and it is likely that the

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[153] Unreported F-tests indicate that the decrease in misreporting for the funds that initiated audit procedures was statistically greater than that for those that did not.

[154] The magnitude of the estimated decrease in misreporting for the funds that initiated audit procedures following the DFA appears greater than that for the funds that did not. Unreported F-tests indicate that the difference is not statistically significant, however. The lack of statistical significance may be due to the relatively low number of funds that initiated audit procedures following the DFA as compared with the Hedge Fund Rule.

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funds that did not initiate audit procedures made other unobservable changes in behavior.

C. Robustness

Finally, in this section I briefly describe robustness tests I have taken to ensure the validity of the results presented above. Although most of the following tests are designed to address potential sample selection biases, I also address the possibility that higher enforcement might reduce misreporting at the margin, even if it does not reduce misreporting on average, and the possibility that my results are driven by changes in misreporting at the control funds rather than at the treatments funds.

1. Self-selection biases. In an ideal experimental setting, all participants are randomly assigned to the treatment and control groups. Although random assignment of this type is extremely rare in real-world settings like the one studied here, there are statistical techniques that attempt to mitigate concerns of sample bias. I use those techniques here to address two potential selection issues. First, I address sample selection related to the control funds. Second, I address selection issues related to the type of regulation to which each fund was subjected.

a. Self-selection of control funds. The control sample in the prior analyses consists of funds that were already subject to federal oversight. By definition, these funds were not chosen at random—indeed, there were significant differences between the control and treatment funds.[155] My first set of robustness tests attempted to mitigate this issue by using propensity

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[155] *See supra* Part II.C.3.

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score matching ("PSM")[156] to match the control funds with similarly situated treatment funds.

For the first step of the PSM—identifying characteristics that predict the likelihood that a fund will be treated—I ran three probit models to create three matched samples.[157] The resulting matched and treated samples were well balanced.[158] Using these matched samples, I replicated the prior regressions in Tables I-III. The results were consistent with the prior findings.[159]

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[156] PSM is a statistical technique that is frequently used to address non-random sample selection issues. PSM identifies observable characteristics that predict the likelihood that an observation will be part of the treatment group, and then uses those characteristics to match the treatment observations with similar control observations. Although the match is performed along observable characteristics, the resulting pairs should theoretically be more similar and aligned along both observable and unobservable characteristics. Despite the benefits of PSM, prior studies have shown that matching is usually unable to replicate the randomness generated in experimental settings. *See* Robert LaLonde, *Evaluating the Econometric Evaluations of Training Programs with Experimental Data,* 76 AMER ECON. REV. 604 (1986); Jeffrey Smith & Petra Todd, *Does Matching Overcome LaLonde's Critique of Nonexperimental Estimators?,* 125 J. ECONOMETRICS 305 (2005).

[157] Each model includes the variables that were used as controls in the prior regressions; for a description of these variables, *see supra* note 141. These three models predict the likelihood that a fund will (1) become regulated as per the Hedge Fund Rule; (2) withdraw after *Goldstein*; and (3) become regulated as per the DFA. I match each treatment fund with the most similarly situated control fund—provided that the two propensity scores are within 0.5 of the standard deviation of the propensity score—with the same investment style, provided that I match only U.S. funds to U.S. funds, and only non-U.S. funds to non-U.S. funds.

[158] Across all three samples, the mean of only one control variable differed significantly.

[159] Relative to those reported in the Article, the magnitude of the decrease in misreporting using the PSM samples for the Rule (DFA) increases (decreases) slightly—thus bringing the estimates closer to one another. Statistical significance is comparable. I do not run the analyses with fund fixed effects because of the small number of observations.

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b. Self-selection in the type of regulation. Firms with between $100 and $150 million in U.S. assets generally have the choice to be subject to *only* federal disclosure rules or to *both* disclosure and enforcement rules; this choice creates a potential self-selection bias. To address this potential bias, I took the steps described below.

1) Self-selection of disclosure-only funds. I used two approaches to address the possible bias arising from the fact that firms self-select in or out of the disclosure-only regime. First, I used PSM. The sample for the first-step probit model included only the disclosure-only and disclosure-and-enforcement groups and predicted the likelihood that a particular fund would choose the disclosure-only regime. Based on the results of the model, I created a matched set of funds from these two groups,[160] and I ran difference-in-differences regressions to compare the change in misreporting between these groups. As before, the decrease in misreporting after regulation was statistically equivalent for both groups.

Second, I exploited the potential discontinuity at $150 million in U.S. assets. Because U.S. advisors who select the disclosure-only option must have between $100 and $150 million in U.S. assets, I compared these disclosure-only advisors to the disclosure-and-enforcement advisors with $150 to $200 million in assets. The idea behind this test is that the advisors with just over and just under $150 million should be very similar. This subsample was very small because it had to be limited to U.S. advisors to apply the cutoff,[161] but the results were consistent with the findings described above.

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[160] With a single exception, the mean values of all control variables in the resulting matched and treatment samples did not differ significantly.

[161] Differences in the nature of this cutoff for foreign advisors made it impossible, based on the information available on Form ADV, to reliably determine which foreign advisors were eligible for disclosure-only treatment. Thus, I limited my sample for purposes of

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2) Self-selection of enforcement funds. Some funds submitted to federal enforcement voluntarily. To avoid a potential bias due to this voluntary decision, I included only funds *required* to submit to federal enforcement. The analysis therefore included only enforcement-only and enforcement-and-disclosure funds, but the results for these two groups are consistent with the findings described in the Article: the enforcement-and-disclosure funds significantly decreased misreporting, but there was no change in misreporting for the enforcement-only funds.

2. Cross-sectional variation in the likelihood of enforcement. I also considered the possibility that examinations may have reduced misreporting at the funds most likely to be examined, even if they did not reduce misreporting on average. To address this option, I determined each fund's relative likelihood of enforcement in two ways. First, because the SEC prefers to examine firms geographically closer to its offices,[162] I divided the funds by whether they were located within 100 kilometers of an SEC regional office. Second, because the SEC conducts risk-based exams in which it is more likely to examine funds with higher *ex ante* fraud risk, I created an index based on the six characteristics from Form ADV that the SEC has previously indicated it considers when determining an advisor's potential fraud risk.[163] Using both measures, I partitioned the funds subject to federal enforcement by whether they were more or less likely to be examined, and I tested whether the funds more likely to be examined had greater decreases in misreporting than those less likely to be

this test only to U.S. advisors with between $100 million and $200 million in assets. The resulting sample is severely limited, but I include the results for completeness.

[162] *See* Kedia & Rajgopal, *supra* note 137. I used 100 kilometers following prior work, but the results were not sensitive to alterative cutoffs such as 75 or 125 kilometers.

[163] *See* ABROMOVITZ, *supra* note 32, at 25. The first three factors are whether the advisor has custody of client assets, prior disciplinary infractions, or other business activities. The next three are whether the advisor engages in principal or cross transactions, uses solicitors, or receives performance fees.

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examined. I found no evidence that the funds more likely to be examined had statistically greater decreases in misreporting.

  3. Change in misreporting at the control sample. Finally, I addressed the possibility that my results may have been caused by an increase in misreporting at the control funds rather than a decrease in misreporting at the treatment funds.[164] To confirm that my results were in fact driven by a decrease in misreporting at the treatment funds, I ran all models using only the treatment funds and confirmed that these funds decreased misreporting relative to *their own* level of misreporting prior to the change in law.[165] I also note the following: (1) the treatment funds significantly decreased misreporting relative to the control funds in all specifications—even those in which the control funds did not increase misreporting; and (2) the control funds in the propensity-score matched sample for the DFA did not significantly increase misreporting after the change in law in any of the models. Nonetheless, because the effect of mandatory regulation on the funds already subject to federal oversight is important to understanding the economic consequences of hedge fund regulation, it deserves attention in future work.

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[164] My analysis provides some evidence in favor of this theory. *See supra* notes 148-50.

[165] Statistical significance disappears in a limited number of models, but the coefficient on the Post variable, which represents the relative difference in misreporting after the change in law, is consistently negative.

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