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journal homepage: www.elsevier.com/locate/jfecPredicting fraud by investment managers[☆]Stephen G. Dimmock^{a,*}, William C. Gerken^b^a Division of Finance and Banking, Nanyang Technological University, Singapore 639798, Singapore^b Department of Finance, Auburn University, Auburn, AL 36849, United States

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ABSTRACT

We test the predictability of investment fraud using a panel of mandatory disclosures filed with the SEC. We find that disclosures related to past regulatory and legal violations, conflicts of interest, and monitoring have significant power to predict fraud. Avoiding the 5% of firms with the highest ex ante predicted fraud risk would allow an investor to avoid 29% of fraud cases and over 40% of the total dollar losses from fraud. We find no evidence that investors receive compensation for fraud risk through superior performance or lower fees. We examine the barriers to implementing fraud prediction models and suggest changes to the SEC's data access policies that could benefit investors.

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1. Introduction

On December 11, 2008, the Securities and Exchange Commission (SEC) charged Bernard Madoff with securities fraud for committing an \$18 billion Ponzi scheme.¹ This case emphasized the opportunities advisers have to exploit investors and the importance of limiting advisers' opportunistic behavior through either market or regulatory forces. In the U.S., the regulatory system protects investors primarily through mandatory disclosures. Investment advisers must file Form ADV to disclose information about their operations, conflicts of interest, disciplinary histories, and other material facts. Investors are then responsible for using these disclosures to assess advisers' fraud risk. In this paper, we address the

¹ See "SEC Charges Bernard L. Madoff for Multi-Billion Dollar Ponzi Scheme," <http://www.sec.gov/news/press/2008/2008-293.htm>

question: Could investors use these mandatory disclosures to predict fraud?

To address this question, we use an annual panel of Form ADVs filed from August 2001 through July 2006. The panel includes 13,853 investment advisers who advise more than 20 million clients and control more than \$32 trillion in assets (as of August 2005). These firms advise all mutual funds, nearly all institutional investment funds, and many hedge funds in the U.S. Although the SEC provides public access to each investment adviser's current Form ADV filing, this panel of historical filings is not publicly available, and we are the first researchers to use these data. Our data also include a review of all SEC administrative proceedings and litigation releases from August 2001 through July 2010 to identify those cases in which investment advisers defrauded their clients.

We find that Form ADV disclosures related to past regulatory violations, conflicts of interest, and monitoring are all significant predictors of fraud. Of key importance for investors and regulators, the results show that an investor who avoided the 5% of firms with the highest ex ante predicted fraud risk would avoid 29% of fraud cases and over 40% of the dollar losses from fraud² (although to obtain these benefits, the investor would have to forgo investing with 5% of non-fraudulent advisers). Out-of-sample tests confirm the robustness of the fraud predictions.

These findings are subject to several limitations. First, only *detected* fraud cases are included in the prediction models. Although we conduct extensive out-of-sample tests, we cannot reject the possibility that prediction models are biased because undetected fraud cases are unobservable. Second, although we find that certain characteristics, such as conflicts of interest, can predict fraud, we cannot infer that conflicts of interest cause fraud, or that their prohibition would deter fraud. Prediction does not imply causality, as firms' characteristics may be jointly determined with the decision to commit fraud. Third, in addition to the disclosures mandated by the SEC, investors may assess fraud risk using other sources of information that we do not include in our models. Finally, prediction is not the sole purpose of disclosure; it is also intended to deter fraud. We do not address this deterrent effect of disclosure in this paper.

If the Form ADV data were not useful for predicting fraud, then either disclosure deters fraud so effectively that it eliminates the predictability that would occur in the absence of disclosure or the disclosed information is worthless. Our findings thus provide evidence that regulators require investment advisers to disclose relevant information.

The predictability of fraud raises the question: why do investors allocate money to firms with high fraud risk? One possibility is that the characteristics that predict fraud provide offsetting benefits for investors. For example, affiliation with a brokerage firm could reduce transaction costs or expedite trading. In-house custody of

clients' assets could increase fraud risk but reduce costs, resulting in lower fees for investors (e.g., Cassar and Gerakos, 2010). Darby and Karni (1973), Karpoff and Lott (1993), Klein and Leffler (1981), and Lott (1996) argue that if investors differ in their valuation of fraud risk, then some investors would accept a high level of fraud risk in return for superior performance or lower fees, while other investors would choose low fraud risk and accept worse performance or higher fees. To test whether investors receive compensation for fraud risk, we classify investment funds based on their advisers' predicted fraud risk. This subsample includes only the subset of firms that manage funds included in the Trading Advisor Selection System (TASS) hedge fund, Center for Research in Security Prices (CRSP) mutual fund, and/or Plan Sponsor Network (PSN) Informa databases. For all three types of funds, we find no evidence that investors receive compensation for fraud risk through superior performance or lower fees. However, we cannot rule out the possibility that investors receive some other form of compensation.

Given the surprising result that fraud risk is both predictable and apparently uncompensated, we turn to another possibility. Perhaps barriers to implementing a predictive model cause the costs to outweigh the potential benefits. To explore this possibility, we compare two types of predictive models, both of which take the perspective of an investor attempting to implement a fraud prediction model during the sample period. The first predicts fraud using only the limited subset of information that would have been publicly accessible. Until 2010, the general public had access to only contemporaneous cross-sections of filings; thus, the independent variables in these tests are taken from the contemporaneously accessible filings. The second type of model predicts fraud using a panel of prior filings. These tests show what would have been possible if historical filings have been contemporaneously accessible during the sample period; these models are moderately better at predicting fraud out-of-sample. We discuss simple changes to data access policies that could improve investors' ability to predict fraud.

The paper proceeds as follows. Section 2 discusses the related literature. Section 3 describes our data. Section 4 contains tests of the predictability of fraud. Section 5 tests the relation of fraud risk with the performance and fees of investment funds. Section 6 examines the costs and barriers to predicting fraud. Section 7 concludes.

2. Related research

To our knowledge, just two papers, Bollen and Pool (2010) and Zitzewitz (2006), develop methods to detect fraud by investment advisers. Bollen and Pool (2010) build on earlier studies of hedge funds' manipulation of reported returns (Bollen and Pool, 2008, 2009; Straumann, 2009) and find that suspicious return patterns can predict fraud charges. Zitzewitz (2006) shows that daily fund flows provide information about late trading in mutual funds. Although these papers, like ours, develop methods to detect fraud, they analyze returns and fund

² For example, the predicted fraud risk of Bernard L. Madoff Investment Securities is above the 95th percentile.

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