

Web Appendix

Predicting fraud by investment managers[☆]

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Abstract

This appendix contains analyses and robustness checks that are discussed but not included in the paper.

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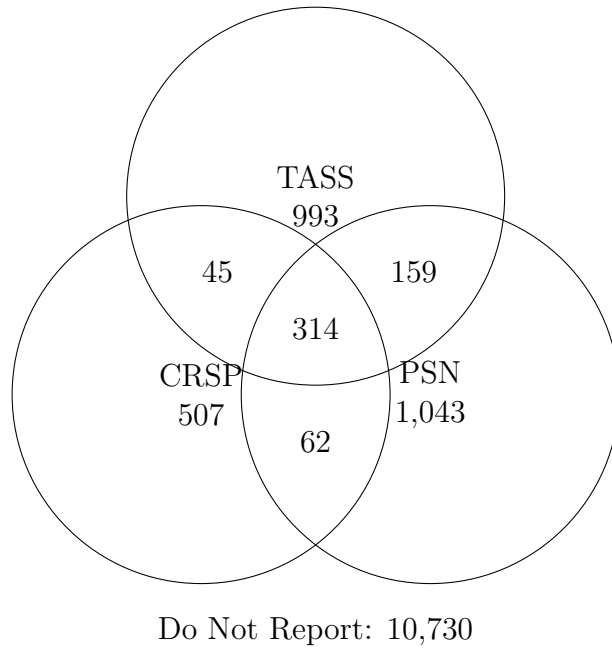
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Web Figure 1

Return database matching Venn diagram

This diagram shows the overlap of the 13,853 unique firms in the Form ADV sample that report to the three return databases (TASS hedge fund, CRSP mutual fund, and PSN institutional fund).



Web Appendix A

Fund level summary statistics

This table presents summary statistics for the three subsamples of Form ADV data merged with the return databases. (Basic summary statistics are discussed in Section 3.3, and results using these data are discussed in Section 5 of the paper.) The first column presents characteristics of the merged Form ADV - TASS hedge fund dataset (TASS). The second column presents characteristics of the merged Form ADV - CRSP mutual fund dataset (CRSP). The third column presents characteristics of the merged Form ADV - PSN institutional fund dataset (PSN). For the merged TASS dataset, we use all funds. For the CRSP and PSN datasets, we only include equity funds. Firms matched is the percentage of the firms in each return database that are matched to the Form ADV sample. Funds matched is the percentage of funds in the return database whose adviser files Form ADV. Fund assets matched is the percentage of total assets in the return database that are managed by firms whose adviser files Form ADV. High Risk equals one if the firm's predicted fraud risk is greater than the 95th percentile of clean firms. Fund AUM is the assets under management for the fund. Fund Age is the fund age in years. Fund Offshore equals one if the fund is registered offshore (i.e., non-US). Leverage equals one if the fund uses leverage. Firm AUM is the assets under management for the firm that advises the fund. Turnover % is the annual percentage turnover of the fund's portfolio. Index Fund equals one if the fund is an index fund.

	TASS	CRSP	PSN
Firms matched	37.2%	100	88.2
Funds matched	27.0%	100	84.8
Fund assets matched	28.6%	100	89.9
Monthly return	0.78%	0.87	0.89
Management fee	1.45%	1.32	0.68
Incentive fee	15.63%		
High Risk	7.1%	44.7	35.5
Fund AUM (\$ million)	194.8	1,195.3	1,774.2
Fund Age (years)	3.2	5.6	
Fund Offshore	56.3%		
Leverage	55.4%		
Firm AUM (\$ million)		34,928	91,474
Turnover %		85.9%	72.6
Index Fund		4.2%	

Web Appendix B

Fraud risk and performance in the TASS hedge fund database

In this table we test the relation of fraud risk with alphas using the TASS hedge fund (TASS) database. (This table extends the results in Table 7 Panel A of the paper.) Each investment adviser's fraud risk is defined as the predicted value from the regression reported in column three of Table 3. We assign this measure of fraud risk to each fund managed by that investment adviser. In Panel A, we create two equally weighted portfolios based on the funds' predicted fraud risk. The high fraud risk portfolio includes all funds advised by firms whose predicted fraud risk is greater than the 95th percentile of clean firms. The low fraud risk portfolio includes all other funds. In Panel B, we repeat the process using value weighted portfolios. We estimate monthly alphas using the Fung and Hsieh (2001) model. The Fung-Hsieh factors are: PTFSBD (bond), PTFSFX (currency), PTFSKOM (commodity), Δ TERM (the change in the term spread), Δ CREDIT (the change in the credit spread), EMERG (MSCI Emerging Market index), EXMKT (excess market return), and SMB (small minus big). High-Low is the alpha of a portfolio long high fraud risk funds and short low fraud risk funds. The row Missing shows the alpha of a portfolio long hedge funds from TASS that do not match to the Form ADV sample. The t-statistics, reported in square brackets, are adjusted using the method of Newey and West (1987) with three lags. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

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Panel A: Equal weighted portfolios									
Risk	α	PTFSBD	PTFSFX	PTFSKOM	Δ TERM	Δ CREDIT	EMERG	EXMKT	SMB
Low	0.0045*** [5.96]	-0.0019 [0.33]	0.0094** [2.55]	0.0062 [1.25]	-0.0491*** [3.15]	-0.0561** [2.01]	0.0285** [2.26]	0.1886*** [9.27]	0.1329*** [5.32]
High	0.0034*** [4.24]	-0.0021 [0.37]	0.0042 [1.06]	0.0034 [0.55]	-0.0447*** [2.70]	-0.0255 [1.00]	0.0429*** [3.39]	0.2179*** [10.12]	0.1900*** [6.99]
High-Low	-0.0012** [2.21]	-0.0002 [0.05]	-0.0052 [1.49]	-0.0028 [0.70]	0.0044 [0.51]	0.0305*** [2.85]	0.0145* [1.91]	0.0293** [1.97]	0.0571*** [3.64]
Missing	0.0058*** [6.10]	0.0020 [0.28]	0.0134*** [3.61]	0.0078 [1.28]	-0.0490*** [2.65]	-0.0612* [1.87]	0.0253* [1.65]	0.1842*** [7.16]	0.1304*** [4.20]
Panel B: Value weighted portfolios									
Risk	α	PTFSBD	PTFSFX	PTFSKOM	Δ TERM	Δ CREDIT	EMERG	EXMKT	SMB
Low	0.0042*** [5.17]	-0.0034 [0.40]	0.0053 [1.31]	0.0056 [0.94]	-0.0619*** [3.49]	-0.0813** [1.96]	0.0131 [0.69]	0.0997*** [3.97]	0.0872*** [3.17]
High	0.0034*** [2.31]	-0.0021 [0.25]	-0.0072 [1.06]	-0.0010 [0.12]	-0.0257 [0.97]	-0.0477 [1.52]	0.0637*** [3.09]	0.0991*** [2.75]	0.0489 [1.09]
High-Low	-0.0009 [0.49]	0.0013 [0.16]	-0.0125 [1.61]	-0.0065 [0.82]	0.0362 [1.24]	0.0336 [0.83]	0.0506** [2.00]	-0.0006 [0.02]	-0.0384 [0.86]
Missing	0.0052*** [5.32]	-0.0094 [0.76]	0.0044 [0.77]	0.0151* [1.72]	-0.0425* [1.78]	-0.0286 [0.56]	0.0681** [2.37]	0.0741** [2.52]	0.0507 [1.45]

Web Appendix C

Fraud risk and performance in the CRSP mutual fund database

In this table we test the relation of fraud risk with alphas using the CRSP Mutual Fund (CRSP) database. (This table extends the results in Table 7 Panel A of the paper.) Each investment adviser's fraud risk is defined as the predicted value from the regression reported in column three of Table 3. We assign this measure of fraud risk to each fund managed by that investment adviser. We include only equity funds. In Panel A, we create two equally weighted portfolios based on the funds' predicted fraud risk. The high fraud risk portfolio includes all funds advised by firms whose predicted fraud risk is greater than the 95th percentile of clean firms. The low fraud risk portfolio includes all other funds. In Panel B, we repeat this process using value weighted portfolios. We estimate monthly alphas using the Carhart (1997) model where EXMKT, SMB, HML, and MOM are taken from Ken French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. High-Low is the alpha of a portfolio long high fraud risk funds and short low fraud risk funds. The t-statistics, reported in square brackets, are adjusted using the method of Newey and West (1987) with three lags. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

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Panel A: Equal weighted portfolios					
Risk	α	EXMKT	SMB	HML	MOM
Low	-0.0021*** [5.52]	0.9937*** [67.39]	0.1930*** [15.51]	0.0101 [0.62]	0.0240*** [3.18]
High	-0.0021*** [4.43]	0.9955*** [52.21]	0.1922 [10.78]	-0.0139 [0.59]	0.0289*** [3.38]
High-Low	0.0000 [0.13]	0.0018 [0.31]	-0.0008 [0.09]	-0.0240** [2.24]	0.0049 [0.94]
Panel B: Value weighted portfolios					
Risk	α	EXMKT	SMB	HML	MOM
Low	-0.0010*** [3.00]	0.9787*** [85.85]	0.0764*** [6.30]	-0.0165 [1.19]	-0.0028 [0.30]
High	-0.0013*** [3.53]	0.9899*** [66.00]	0.0729*** [4.80]	-0.0226 [1.11]	0.0257*** [2.78]
High-Low	-0.0003 [1.04]	0.0112 [0.87]	-0.0035 [0.21]	-0.0061 [0.28]	0.0284*** [2.48]

Web Appendix D

Fraud risk and performance in the PSN institutional fund database

In this table we test the relation of fraud risk with alphas using the Plan Sponsor Network (PSN) database. (This table extends the results in Table 7 Panel A of the paper.) Each investment adviser's fraud risk is defined as the predicted value from the regression reported in column three of Table 3. We assign this measure of fraud risk to each fund managed by that investment adviser. We include only equity funds. In Panel A, we create two equally weighted portfolios based on the funds' predicted fraud risk. The high fraud risk portfolio includes all funds advised by firms whose predicted fraud risk is greater than the 95th percentile of clean firms. The low fraud risk portfolio includes all other funds in the merged sample. In Panel B, we repeat this process using value weighted portfolios. We estimate monthly alphas using the Carhart (1997) model where EXMKT, SMB, HML, and MOM are taken from Ken French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. High-Low is the alpha of a portfolio long high fraud risk funds and short low fraud risk funds. Missing is the alpha of a portfolio long institutional funds from PSN that do not map to the Form ADV sample. The t-statistics, reported in square brackets, are adjusted using the method of Newey and West (1987) with three lags. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Equal weighted portfolios					
Risk	α	EXMKT	SMB	HML	MOM
Low	0.0001 [0.14]	0.9606*** [59.53]	0.2538*** [14.18]	0.1208*** [5.02]	0.0417*** [2.65]
High	0.0001 [0.20]	0.9869*** [54.26]	0.2447*** [10.20]	0.1160*** [3.80]	0.0391** [2.27]
High-Low	0.0001 [0.19]	0.0263*** [3.72]	-0.0091 [0.75]	-0.0048 [0.35]	-0.0026 [0.28]
Missing	0.0006 [0.81]	0.9764*** [44.97]	0.2791*** [12.24]	0.1511*** [4.84]	0.0642*** [3.03]
Panel B: Value weighted portfolios					
Risk	α	EXMKT	SMB	HML	MOM
Low	0.0007 [1.31]	0.9979*** [46.68]	0.0667*** [3.07]	0.1227*** [4.19]	0.0148 [0.98]
High	0.0004 [0.59]	1.0016*** [45.56]	0.0858*** [2.96]	0.1049*** [3.02]	0.0071 [0.37]
High-Low	-0.0004 [1.42]	0.0037 [0.52]	0.0191** [1.91]	-0.0179 [1.31]	-0.0077 [0.80]
Missing	0.0006 [0.81]	0.9716*** [36.41]	0.1346*** [4.70]	0.1598*** [4.92]	0.0527** [2.38]

Web Appendix E

Firm failure following fraud

This table presents estimates from survival hazard models in which failure is defined as a firm not filing Form ADV in the subsequent year. (This table supports the discussion in Section 4.1 about firm failure following fraud.) We report hazard ratios from Cox proportional hazards models. Fraud Detected equals one in the year in which the fraud is detected by the SEC. Z-scores are reported in square brackets. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Fraud Detected	2.492**	2.670**	2.586**
	[2.23]	[2.40]	[2.32]
Past Fraud			2.502***
			[5.11]
Past Affiliated Fraud			0.857*
			[1.72]
Past Regulatory			0.902**
			[2.22]
Past Civil or Criminal			1.133*
			[1.83]
Referral Fees			0.998
			[0.08]
Interest in Transaction			0.916**
			[2.47]
Soft Dollars			1.009
			[0.31]
Broker in Firm			1.047
			[1.47]
Investment Company Act			0.787***
			[4.37]
Custody			1.240***
			[6.12]
Dedicated CCO			1.964***
			[18.73]
Majority Employee Owned			0.908***
			[2.91]
Log (Avg. Acct. Size)			1.289***
			[23.29]
Percent Client Agents			0.994***
			[10.51]
Hedge Fund Clients			1.338***
			[5.67]
Log (AUM)		0.947***	0.770***
		[29.16]	[29.20]
Observations	53,994	53,994	53,994

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