Internet Appendix

The Corporate Investment Benefits of Mutual Fund Dual Holdings

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A. Internet Appendix

A. Summary statistics of the initial sample

As described in Section III, our sample starts in 2008 because Schwarz and Potter (2016) point out inaccurate holding information in CRSP Survivor-Bias-Free Mutual Fund Database prior to 2008. We obtain stock price data from CRSP, financial reporting data from COMPUSTAT, and corporate bond information from the Mergent FISD. We require firms to have mutual fund equity ownership and outstanding bonds and exclude financial firms (SIC 6000-6999) and utilities (SIC 4900–4999). This sample consists of 10,452 firm-year observations and 1,409 unique firms. Based on this initial sample, we further construct the difference-in-differences (DID) sample used in the main analyses.

While Table I in the main text reports the summary statistics of the DID sample, Table A1 presents the the summary statistics of this initial panel sample. The key variable of interest is the firm-level mutual fund dual holding variable MFDH, which is right-skewed and equals 0 for about 50% of the sample. We therefore also report the distribution of MFDH with only positive values, which has a mean of 0.13 and a median of 0.10. Average COOPERATIVE_MFDH exceeds average COMPETITIVE_MFDH, suggesting that dual ownership is more likely to occur among cooperative fund families than among competitive families. The summary statistics of other firm-level outcome and control variables are similar to those of the COMPUSTAT universe, except that our sample has higher total institutional ownership, lower ownership concentration, and more (non-dual) mutual fund bond holdings.

The key independent variable is the firm-level mutual fund dual holding, which is right-skewed and equals 0 for about 50% of the sample. Therefore, we also report the distribution

of MFDH with only positive values, which has a mean of 0.13 and a median of 0.10. Average COOPERATIVE_MFDH exceeds average COMPETITIVE_MFDH suggests that dual ownership is more likely to occur among cooperative fund families than competitive families.

TABLE A1

Summary statistics

This table reports summary statistics of the firm-level characteristics. All continuous variables are winsorized at 1% and 99% levels. All variables are defined in the Appendix.

				Percentile				
	N	Mean	St. Dev.	10th	25th	50th	75th	90th
MFDH	10,452	0.07	0.11	0	0	0	0.10	0.21
MFDH (MFDH $>$ 0)	5,151	0.13	0.12	0.02	0.05	0.10	0.19	0.29
COOPERATIVE_MFDH	10,452	0.03	0.05	0.00	0.00	0.00	0.05	0.10
COMPETITIVE_MFDH	10,452	0.01	0.02	0.00	0.00	0.00	0.01	0.02
CAPEX	10,438	0.24	0.28	0.07	0.11	0.18	0.28	0.46
STOCK_VOLATILITY	9,997	0.44	0.29	0.20	0.26	0.36	0.53	0.77
ROA_VOLATILITY	10,449	0.02	0.05	0.00	0.01	0.01	0.02	0.04
TOTAL_ASSETS ($M)	10,452	11,902	31,049	372	984	2,815	8,730	28,538
MARKET-TO-BOOK	10,439	1.95	1.42	0.97	1.17	1.53	2.17	3.29
LEVERAGE	10,446	0.34	0.27	0.05	0.17	0.29	0.45	0.65
TANGIBILITY	10,449	0.33	0.30	0.04	0.10	0.22	0.50	0.78
CASH	10,452	0.02	0.12	-0.06	-0.02	0.00	0.03	0.09
ROA	10,452	0.07	0.16	-0.05	0.04	0.08	0.13	0.19
PAYOUT	10,452	0.04	0.05	0	0	0.02	0.05	0.09
INST_OWN	10,452	0.73	1.80	0.20	0.59	0.80	0.92	1.00
OWN_HHI	10,452	0.11	0.19	0.03	0.04	0.05	0.08	0.22
MF_BOND_OWN	10,452	0.04	0.09	0	0	0	0.06	0.12
BANK_OWN	10,452	0.04	0.04	0	0	0	0.05	0.08

B. Treated vs. matched control firms

Table A2 reports univariate comparisons on firm characteristics of the treated and control firms used in the difference-in-difference analysis in the pre-event year. Firms in the treated group are firms that experience a change in our mutual fund dual holding measure MFDH following a cross-family mutual fund merger. Control firms are selected by one-to-one propensity score matching from firms that are not impacted by cross-family mutual fund mergers. To construct the control group, we apply a one-to-one non-replacement matching within the same industry-year cohort and use propensity scores to match on the following characteristics, measured at the fiscal year ending immediately before the mergers: firm size, market-to-book ratio, institutional

ownership, other mutual fund bond holdings, and mutual fund dual holding level. As is shown, the two groups are similar, as the differences between treated and control firms are small and statistically insignificant.

TABLE A2

Pre-event: Treated vs. matched control comparison

This table reports univariate comparisons on firm characteristics of the treated and control firms used in the difference-in-difference analysis in the pre-event year. Firms in the treated group are firms that experience a change in our mutual fund dual holding measure MFDH following a cross-family mutual fund merger. Control firms are selected by one-to-one propensity score matching from firms that are not impacted by cross-family mutual fund mergers. Differences in group means are reported along with p-values. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	All	Treated	Control	Difference	P-value
CAPEX	0.214	0.211	0.216	-0.005	0.637
BOND_ISSUANCE	0.336	0.357	0.315	0.042	0.145
Log(ASSETS)	9.298	9.390	9.208	0.181	0.025
MARKET-TO-BOOK	2.055	2.089	2.021	0.067	0.329
LEVERAGE	0.287	0.282	0.292	-0.010	0.385
TANGIBILITY	0.314	0.303	0.325	-0.021	0.219
CASH	0.009	0.007	0.012	0.008	0.302
INSTITUTIONAL_OWN	0.791	0.798	0.784	0.014	0.371
OWN_HHI	0.058	0.055	0.060	-0.005	0.484
MF_BONDOWN	0.081	0.085	0.077	0.008	0.278
MFDH	0.100	0.102	0.099	0.003	0.677
FD	0.006	0.002	0.009	-0.007	0.107
Number of Event Firms	1,112	556	556		
Number of Unique Event Firms	499	237	262		

C. Panel regression results

We use firm-level panel regressions to estimate whether there is a correlation between mutual fund dual holdings and different firm outcomes. Specifically, we estimate different versions of the following regression specification:

$$y_{it} = \alpha + \beta * \text{MFDH}_{it} + +\gamma' X_{it-1} + FirmFE_i + Industry \times YearFE_{it} + \varepsilon_{it},$$

where i indexes firms, t indexes years, and y_{it} is the dependent variable of interest (e.g., capital investments). MFDH is the firm-level mutual fund dual holding measure that we construct as described in Section B. The vector of control variables X_{it-1} includes lagged firm characteristics

(firm size, fixed assets, market-to-book ratio, cash holdings, profitability, and payout value) and contemporaneous ownership characteristics (percentage of institutional ownership, institutional ownership concentration, (non-dual ownership) mutual fund bond holdings, and banks ownership). By including industry $\times$ year fixed effects, we are effectively comparing firms within the same industry (Fama-French-12) at the same time, thereby controlling for common factors such as industry-wide shocks to investment opportunities. We also include firm fixed effects to control for firm-specific time-invariant unobserved factors that might influence the match between firms and mutual funds. We cluster standard errors at the firm level.

In Table A3, we estimate the above panel regression where the dependent variable is capital investment. In all columns, we find a significantly positive coefficient on the MFDH variable, suggesting that dual ownership increases investment. In column 4, we differentiate the dual ownership of cooperative families from that of competitive families and find only a significantly positive coefficient estimate on COOPERATIVE_MFDH. In column 5, the coefficient on the interaction term between MFDH and FD is significantly positive, implying that dual holdings increase investments more for financially distressed firms. In column 6, the coefficient on the interaction term between MFDH and ENTRENCHMENT is significantly negative, implying that dual holdings reduce investments of firms with entrenched managers.

In Table A4, we estimate the above panel regression to examine firm risk-taking behavior. In columns 1-3, the dependent variable is the annualized stock return volatility over the 90 trading days prior to fiscal year-end. In columns 4-6, we consider an alternative risk-taking measure by calculating the standard deviation of return-on-asset (ROA) changes over the past eight quarters. None of MFDH, COOPERATIVE_MFDH, COMPETITIVE_MFDH, or the interaction term

between MFDH and the FD dummy or the ENTRENCHMENT dummy has a significant coefficient in any of the specifications.

In sum, the standard panel regression approach yields results that are consistent with our baseline instrumented difference-in-differences approach.

TABLE A3

Mutual fund dual holding and firm investment

This table shows panel regressions of capital investments on mutual fund dual holdings. The dependent variable is the capital expenditures scaled by lagged capital. Dual holding variables are constructed as described in Section B. FD is a dummy variable indicating financially distressed firms, which equals one if the firm is in the upper quartile of the leverage ratio. The control variables log(assets), market-to-book, tangibility, cash holding, profitability, and payout ratio are lagged. All variables are defined in the Appendix. Standard errors are clustered at the firm level and corresponding t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. Variable	CAPEX					
	1	2	3	4	5	6
MFDH	0.065**	0.061**	0.082***		0.065**	0.085**
	(2.135)	(1.982)	(2.887)		(2.252)	(2.076)
COOPERATIVE_MFDH				0.158**		
				(2.549)		
COMPETITIVE_MFDH				-0.072		
				(-0.586)		
MFDH × FD					0.071**	
					(2.004)	
MFDH × ENTRENCHMENT						-0.172*
						(-1.652)
FD					-0.025**	
					(-2.546)	
ENTRENCHMENT						0.007
						(0.962)
Log(ASSETS)	-0.024***	-0.024***	-0.052***	-0.052***	-0.050***	-0.052***
	(-7.642)	(-7.924)	(-3.712)	(-3.700)	(-3.539)	(-3.685)
MB	0.039***	0.038***	0.033***	0.033***	0.033***	0.025**
	(9.636)	(9.077)	(4.093)	(4.083)	(4.073)	(2.534)
LEVERAGE	-0.111***	-0.093***	-0.088***	-0.087***	-0.084***	-0.053**
	(-8.174)	(-7.169)	(-3.788)	(-3.759)	(-3.621)	(-1.987)
TANGIBILITY	-0.141***	-0.219***	-0.339***	-0.339***	-0.340***	-0.358***
	(-10.480)	(-12.896)	(-7.275)	(-7.275)	(-7.297)	(-7.786)
CASH	-0.070	-0.064	-0.108**	-0.108**	-0.109**	-0.050
	(-1.545)	(-1.446)	(-2.325)	(-2.331)	(-2.349)	(-0.731)
ROA	-0.142***	-0.123***	0.076	0.075	0.072	0.046
	(-3.561)	(-2.930)	(0.936)	(0.927)	(0.891)	(0.595)
PAYOUT	-0.032	-0.036	0.019	0.019	0.022	0.068
	(-0.521)	(-0.613)	(0.271)	(0.273)	(0.322)	(1.219)
INST_OWN	-0.001*	-0.001**	0.000	0.000	0.000	0.051
	(-1.654)	(-2.130)	(1.067)	(0.878)	(0.772)	(1.632)
OWN_HHI	-0.046***	-0.035**	-0.093***	-0.094***	-0.094***	0.009
	(-2.621)	(-2.059)	(-2.606)	(-2.626)	(-2.633)	(0.167)
MF_BONDOWN	0.038	0.026	0.127***	0.127***	0.134***	0.132**
	(1.194)	(1.100)	(2.696)	(2.742)	(2.831)	(2.473)
BANK_OWN	-0.166	-0.079	0.022	0.021	0.019	0.032
	(-1.513)	(-1.091)	(0.375)	(0.349)	(0.320)	(0.278)
Observations	10,418	10,418	10,418	10,418	10,418	5,617
Adjusted R-squared	0.143	0.182	0.312	0.312	0.312	0.493
Industry × Year FE	No	Yes	Yes	Yes	Yes	Yes
Event Firm FE	No	No	Yes	Yes	Yes	Yes

TABLE A4

Mutual fund dual holding and firm risk

This table shows panel regressions of firm risk on mutual fund dual holdings. Firm risk is measured by realized equity volatility in columns 1-3, and by return-on-asset (ROA) volatility in columns 4-6. Dual holding variables are constructed as described in Section B. FD is a dummy variable indicating financially distressed firms, which equals one if the firm is in the upper quartile of the leverage ratio measured by the fiscal year end prior to the acquisition announcement. All regressions include industry × year and firm fixed effects, and the same set of control variables from Table A3. All variables are defined in the Appendix. Standard errors are clustered at the firm level and corresponding t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. Variable	STOCK_VOLATILITY				ROA_VOLATILITY			
	1	2	3	4	5	6	7	8
MFDH	0.028		0.039	0.003	0.005		0.006	-0.003
	(0.705)		(0.933)	(0.065)	(0.845)		(1.023)	(-0.808)
COOPERATIVE_MFDH		0.125				0.021		
		(1.286)				(1.253)		
COMPETITIVE_MFDH		-0.220				-0.039		
		(-1.048)				(-1.254)		
MFDH × FD			-0.144***				-0.001	
			(-3.076)				(-0.190)	
MFDH × ENTRENCHMENT				-0.026				-0.004
				(-0.528)				(-0.628)
FD			0.148***				-0.001	
			(15.216)				(-0.418)	
ENTRENCHMENT				-0.007				0.001*
				(-1.014)				(1.682)
Log(ASSETS)	-0.001	-0.001	-0.011	0.013	-0.015***	-0.015***	-0.015***	-0.004***
	(-0.059)	(-0.095)	(-1.141)	(1.246)	(-4.076)	(-4.106)	(-4.089)	(-3.408)
MB	0.000	0.000	0.001	0.007*	0.004***	0.004***	0.004***	0.002***
	(0.021)	(0.018)	(0.242)	(1.889)	(2.922)	(2.916)	(2.913)	(2.771)
LEVERAGE	0.065***	0.065***	0.039**	0.062***	0.013***	0.013***	0.013***	0.008***
	(4.046)	(4.026)	(2.574)	(3.806)	(2.932)	(2.943)	(2.982)	(3.767)
TANGIBILITY	-0.062**	-0.062**	-0.056**	-0.032	-0.020**	-0.020**	-0.020**	-0.012**
	(-2.276)	(-2.269)	(-2.198)	(-0.995)	(-1.970)	(-1.964)	(-1.968)	(-2.270)
CASH	-0.067***	-0.067***	-0.060***	0.036*	0.015*	0.015*	0.015*	0.005**
	(-3.082)	(-3.070)	(-2.816)	(1.761)	(1.672)	(1.679)	(1.674)	(2.162)
ROA	-0.090***	-0.090***	-0.066**	-0.157***	-0.038	-0.038	-0.038	-0.015**
	(-2.617)	(-2.617)	(-1.991)	(-3.448)	(-1.171)	(-1.173)	(-1.178)	(-1.983)
PAYOUT	-0.149***	-0.150***	-0.162***	-0.084	0.015*	0.015*	0.015*	0.004
	(-2.775)	(-2.789)	(-3.031)	(-1.444)	(1.800)	(1.793)	(1.799)	(0.842)
INST_OWN	-0.018**	-0.018**	-0.020***	-0.036	-0.000	-0.000	-0.000	-0.000
	(-2.343)	(-2.366)	(-2.637)	(-0.920)	(-0.919)	(-0.921)	(-0.943)	(-0.031)
OWN_HHI	0.026	0.026	0.031	0.069	0.014**	0.014**	0.014**	-0.000
	(0.805)	(0.801)	(0.990)	(1.142)	(2.149)	(2.149)	(2.145)	(-0.046)
MF_BONDOWN	0.201***	0.201***	0.184***	0.069	0.003	0.003	0.003	0.008
	(3.473)	(3.392)	(2.855)	(0.867)	(0.354)	(0.381)	(0.326)	(1.051)
BANK_OWN	-0.261**	-0.264**	-0.230**	-0.353***	-0.001	-0.002	-0.001	0.001
	(-2.149)	(-2.163)	(-2.258)	(-2.788)	(-0.163)	(-0.216)	(-0.178)	(0.108)
Observations	9,977	9,977	9,977	5,615	10,426	10,426	10,426	5,620
Adjusted R-squared	0.681	0.681	0.701	0.714	0.468	0.468	0.468	0.775
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

D. Full regression tables including the control variables

TABLE A5

Mutual fund dual holding and firm investment quality

This table reports the DID and 2SLS-DID coefficient estimates of the control variables that are included in Table 2 but suppressed for brevity in the main text.

Dep. Variable	MFDH	Capex				
	1st-stage	OLS	2SLS			
	1	2	3	4	5	6
MERGER	0.032***	0.014***				
	(5.697)	(3.287)				
MFDH			0.445***		0.429***	0.455**
			(3.307)		(3.216)	(2.273)
COOPERATIVE MFDH				0.716**		
				(2.044)		
COMPETITIVE MFDH				-0.834		
				(-0.964)		
MFDH × FD					3.474***	
					(6.072)	
MFDH × ENTRENCHMENT						-0.552***
						(-3.488)
FD					-0.035***	
					(-2.768)	
ENTRENCHMENT						0.036*
						(1.827)
Log(ASSETS)	0.038***	-0.084***	-0.101***	-0.094***	-0.100***	-0.061***
	(5.804)	(-4.255)	(-4.388)	(-4.461)	(-4.418)	(-3.585)
MB	-0.003	0.026***	0.028***	0.026***	0.027***	0.031***
	(-1.672)	(2.863)	(2.957)	(2.825)	(2.955)	(4.997)
LEVERAGE	0.102***	-0.100***	-0.145***	-0.122***	-0.144***	-0.154***
	(6.647)	(-4.640)	(-7.777)	(-6.780)	(-7.594)	(-3.863)
TANGIBILITY	-0.091***	-0.261***	-0.220***	-0.240***	-0.221***	-0.193***
	(-6.580)	(-4.789)	(-4.500)	(-4.705)	(-4.559)	(-4.496)
CASH	0.014	0.057	0.051	0.056	0.050	0.043
	(1.340)	(0.814)	(0.753)	(0.827)	(0.742)	(0.480)
ROA	-0.005	-0.031	-0.029	-0.030	-0.034	-0.008
	(-0.298)	(-0.307)	(-0.287)	(-0.289)	(-0.332)	(-0.105)
PAYOUT	0.090***	-0.003	-0.043	-0.022	-0.043	-0.075
	(4.188)	(-0.067)	(-1.056)	(-0.549)	(-1.081)	(-1.097)
INST_OWN	-0.004	-0.023	-0.022	-0.021	-0.021	0.007
	(-0.507)	(-0.940)	(-0.879)	(-0.842)	(-0.873)	(0.189)
OWN_HHI	0.007	-0.069**	-0.072**	-0.069**	-0.068**	-0.061
	(0.308)	(-2.483)	(-2.344)	(-2.274)	(-2.278)	(-1.306)
MF_BOND_OWN	-0.403***	0.111***	0.290***	0.178**	0.280***	0.162**
	(-3.082)	(3.033)	(3.914)	(2.673)	(3.879)	(2.727)
BANK_OWN	0.002	-0.023	-0.024	-0.027	-0.020	-0.013
	(0.051)	(-0.192)	(-0.189)	(-0.223)	(-0.162)	(-0.154)
Observations	5,325	5,325	5,325	5,325	5,325	3,396
Adjusted R-squared	0.823	0.612				
F-Statistic			32.452	59.143	16.085	14.589
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Event Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

TABLE A6

Mutual fund dual holding and firm risk

This table reports the 2SLS-DID coefficient estimates of the control variables that are included in Table 4 but suppressed for brevity in the main text.

Dep. Variable	STOCK_VOLATILITY				ROA_VOLATILITY			
	1	2	3	4	5	6	7	8
MFDH	-0.018		0.035	0.004	-0.021		-0.021	0.002
	(-0.093)		(0.180)	(0.018)	(-1.666)		(-1.646)	(0.162)
COOPERATIVE_MFDH		0.005				0.001		
		(0.010)				(0.022)		
COMPETITIVE MFDH		0.836				-0.124		
		(0.935)				(-0.851)		
MFDH × FD			0.017				-0.002	
			(0.056)				(-0.123)	
MFDH × ENTRENCHMENT				0.204				-0.049*
				(1.001)				(-1.729)
FD			0.139***				0.001	
			(6.066)				(0.210)	
ENTRENCHMENT				-0.020				0.005*
				(-1.042)				(1.896)
Log(ASSETS)	0.007	0.003	-0.000	0.008	-0.002	-0.002*	-0.002	-0.003
	(0.660)	(0.284)	(-0.004)	(0.929)	(-1.358)	(-1.741)	(-1.392)	(-1.434)
MARKET-TO-BOOK	0.006*	0.006*	0.006*	0.013**	0.002***	0.002***	0.002***	0.002***
	(1.749)	(1.891)	(1.957)	(2.598)	(3.788)	(3.928)	(3.673)	(6.175)
LEVERAGE	0.037	0.026	0.030	0.032	0.012***	0.011***	0.012***	0.013***
	(1.578)	(1.166)	(1.308)	(1.053)	(4.825)	(4.716)	(4.909)	(5.316)
TANGIBILITY	0.017	0.027	0.026	0.044	-0.015***	-0.014***	-0.015***	-0.020***
	(0.520)	(1.001)	(0.824)	(1.193)	(-4.713)	(-3.792)	(-4.692)	(-4.700)
CASH	0.005	0.001	0.009	-0.015	0.003*	0.004**	0.003*	0.004***
	(0.385)	(0.035)	(0.739)	(-1.109)	(1.904)	(2.171)	(1.911)	(3.157)
ROA	-0.118***	-0.117***	-0.099***	-0.078**	-0.027***	-0.027***	-0.027***	-0.024***
	(-3.327)	(-3.200)	(-3.039)	(-2.140)	(-3.080)	(-3.100)	(-3.108)	(-3.706)
PAYOUT	-0.036	-0.050	-0.025	-0.042	0.005*	0.005*	0.005	-0.003
	(-1.069)	(-1.562)	(-0.757)	(-1.410)	(1.705)	(1.743)	(1.661)	(-0.814)
INSTITUTIONAL_OWN	-0.003	-0.002	-0.008	0.036	0.000	0.000	0.000	0.004
	(-0.318)	(-0.258)	(-0.851)	(1.229)	(0.089)	(0.049)	(0.111)	(0.651)
OWN_HHI	-0.007	-0.007	-0.004	-0.011	0.007***	0.007***	0.006***	-0.001
	(-0.429)	(-0.406)	(-0.212)	(-0.381)	(2.832)	(3.041)	(2.755)	(-0.345)
MF_BOND_OWN	0.018	0.090	0.053	-0.007	-0.008	-0.009	-0.008	0.018***
	(0.284)	(1.606)	(0.623)	(-0.165)	(-0.840)	(-1.076)	(-0.855)	(2.938)
BANK_OWN	-0.136***	-0.140***	-0.143***	-0.083	0.001	0.001	0.001	-0.015**
	(-3.089)	(-3.132)	(-3.140)	(-1.260)	(0.084)	(0.156)	(0.082)	(-2.434)
Observations	5,277	5,277	5,277	3,396	5,324	5,324	5,324	3,396
F-Statistic	28.06	71.912	13.041	14.589	32.207	59.040	46.891	14.589
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes