

Mutual Fund Investments in Private Firms

INTERNET APPENDIX

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Abstract:

Historically a key advantage of being a public firm was broader access to capital, from a disperse group of shareholders. In recent years, such capital has increasingly become available to private firms as well. We document a dramatic increase over the past twenty years in the number of mutual funds participating in private markets and in the dollar value of these private firm investments. We evaluate several factors that potentially contribute to this trend: firms seeking extra capital to postpone public listing; mutual funds seeking higher risk-adjusted returns and IPO allocations; and, VCs seeking new investors to substantiate higher valuations. Results provide the strongest support for the first two factors.

Online Appendix Tables and Figures

Table A1: Determinants of mutual fund investments.

This table is equivalent to Table 3, with the exception that the sample consists of the subset of companies that received venture capital financing between 2005 and 2016, 14,808 companies. Each column shows an OLS regression, where the dependent variable equals 1 if the firm received mutual fund financing while private, zero otherwise. The sample in column 1 equals the full sample of 14,808 private companies. In column 2, the sample is restricted to companies with a minimum of two rounds of venture capital financing. Column 3 adds the additional requirement that there are two or more VCs in the syndicate. Finally, column 4 adds the requirement that the amount of capital raised in the first financing round is above the median (compared to the set of first VC round financings in the same calendar year). Variable descriptions are provided in Appendix II. Robust *t*-statistics are reported in parenthesis. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

VARIABLES	(1) I(MF financing)	(2) I(MF financing)	(3) I(MF financing)	(4) I(MF financing)
ln(VC firm age)	0.000 (0.429)	-0.000 (-0.205)	-0.000 (-0.159)	0.000 (0.079)
ln(# Companies funded by VC)	0.000 (0.334)	0.001 (0.533)	0.000 (0.189)	0.001 (0.276)
ln(# Exits by VC)	0.002* (1.735)	0.003 (1.474)	0.003* (1.684)	0.002 (0.604)
ln(Syndicate size)	0.008*** (4.122)	0.010*** (3.098)	0.011*** (2.905)	0.010* (1.704)
ln(Amount raised at first round)	0.005*** (3.820)	0.007*** (3.143)	0.006*** (2.837)	0.014*** (3.114)
ln(# Patents applied)	0.005* (1.716)	0.006* (1.659)	0.006 (1.626)	0.002 (0.303)
Time b/w 1st and 2nd round		-0.004*** (-5.394)	-0.004*** (-5.179)	-0.008*** (-5.365)
CA	0.004** (2.036)	0.006** (2.180)	0.007** (2.061)	0.008* (1.739)
MA	0.010** (2.459)	0.010* (1.711)	0.009 (1.562)	0.011 (1.326)
NY	0.002 (0.627)	0.004 (1.029)	0.005 (1.083)	0.012 (1.564)
TX	-0.004*** (-3.746)	-0.008*** (-4.013)	-0.008*** (-3.705)	-0.010*** (-2.969)
PA	0.001 (0.586)	-0.001 (-0.567)	-0.004* (-1.810)	-0.013*** (-3.160)
Observations	14,808	8,690	7,952	4,619
R-squared	0.027	0.030	0.030	0.037
Specification	OLS	OLS	OLS	OLS
First VC round	2005-2016	2005-2016	2005-2016	2005-2016
Co's with MF investment	128	116	114	88
Stage level FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
First VC round year FE	Yes	Yes	Yes	Yes
Restriction	None	Min 2 VC rounds	Min 2 VC rounds + VC Syn >= 2	Min 2 VC rounds + VC Syn >= 2 + Amt raised above median

Table A2: Type of IPO firm in which mutual funds invest prior to the IPO.

The sample consists of the subset of VC-backed companies, as defined in Table 1, that went public in an IPO between 1997 – 2014 (due to the requirement of two years pre- and post-IPO data). This yields a total of 994 IPOs, of which 58 received mutual fund investments prior to the IPO. Regressions are based on the subset with non-missing values in Compustat for each dependent variable. Columns 1 – 6 compare the variables around the IPO (year -2 through +2, where year 0 is the fiscal year that includes the IPO). I(IPO and beyond) is a dummy variable that equals to 1 in the IPO year and beyond, 0 otherwise. Stage level, location, industry, as well as first VC round year and IPO year fixed effects are also included in all specifications. Total assets and sales are in \$ million. Robust t-statistics are reported in parenthesis. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

VARIABLES	(1) Total assets	(2) Net sales	(3) Expenditure	(4) Gross margin	(5) Expenditure / TA	(6) Cash / TA
I(MF financing)	73.673 (0.988)	23.567 (0.538)	-18.024 (-0.506)	21.080*** (2.577)	0.320 (0.606)	0.058** (2.349)
I(IPO and beyond)	151.756*** (4.660)	52.932*** (4.006)	38.288*** (3.017)	3.023 (0.825)	-1.225*** (-8.017)	0.077*** (9.327)
I(MF financing)*I(IPO and beyond)	1,007.784** (2.362)	354.353** (2.283)	501.056*** (2.825)	-25.736* (-1.646)	-0.211 (-0.381)	-0.059** (-2.006)
ln(VC firm age)	-40.278 (-1.001)	32.907* (1.717)	-5.274 (-0.273)	5.608 (1.534)	-0.325** (-2.482)	-0.051*** (-4.345)
ln(# Companies funded)	-36.174 (-0.823)	-43.443 (-1.533)	34.804** (2.456)	-0.196 (-0.044)	-0.077 (-0.578)	-0.009 (-0.903)
ln(# Exits)	36.052 (0.758)	33.051 (1.222)	-31.001** (-2.174)	-2.057 (-0.627)	0.018 (0.134)	0.044*** (3.917)
ln(Syndicate size)	-260.092*** (-5.895)	-169.342*** (-6.042)	-53.816*** (-3.861)	-1.777 (-0.728)	0.309** (2.273)	0.134*** (14.169)
ln(Amount raised)	241.041*** (5.369)	136.719*** (6.410)	66.281*** (3.950)	-2.209** (-2.005)	-0.003 (-0.043)	-0.028*** (-6.674)
ln(# Patents applied)	172.611** (1.978)	54.943* (1.754)	103.659*** (3.163)	0.832 (0.426)	-0.263*** (-4.469)	0.004 (0.959)
Observations	3,941	3,915	2,646	3,629	2,143	3,940
R-squared	0.134	0.185	0.218	0.068	0.098	0.424
Specification	OLS	OLS	OLS	OLS	OLS	OLS
First IPO year	1997-2014	1997-2014	1997-2014	1997-2014	1997-2014	1997-2014
Co's with MF investment	45	45	35	42	35	45
Stage level FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
First VC round year FE	Yes	Yes	Yes	Yes	Yes	Yes
IPO year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table A3: Relations between mutual fund financing and company outcomes.

The sample consists of VC-backed private firms as described in Table 1, with the additional criteria that the lead VC serve in this role for at least two companies to enable the inclusion of lead VC fixed effects. This results in 26,989 companies, of which 261 received at least one investment from mutual funds. In columns 1 and 2, the dependent variable equals one if the firm has not exited (via either IPO or acquisition) and has not received a funding round for at least four years prior to the end of the sample period. In columns 3 and 4, the dependent variable equals one if the firm exits via IPO. Columns 5 – 6 further limit the sample to companies that exited via either IPO or M&A, resulting in 6,986 companies. For columns 5 and 6, the dependent variable equals ln(time to exit), measured as number of years from the first financing round to exit. Robust t-statistics are reported in parenthesis. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

VARIABLES	(1) Failure	(2) Failure	(3) Exit via IPO	(4) Exit via IPO	(5) ln(Time to exit)	(6) ln(Time to exit)
I(MF financing)	-0.060** (-2.306)		0.195*** (6.808)		0.165*** (4.106)	
ln(Amount raised from MF)		-0.034*** (-5.153)		0.078*** (7.638)		0.044*** (3.175)
<i>First-round VC characteristics</i>						
ln(VC firm age)	-0.032*** (-3.543)	-0.032*** (-3.534)	0.010** (2.066)	0.010** (2.060)	0.014 (0.708)	0.015 (0.715)
ln(# Companies funded)	0.013*** (2.667)	0.013*** (2.649)	-0.003 (-1.247)	-0.003 (-1.149)	-0.053*** (-3.841)	-0.053*** (-3.810)
ln(# Exits)	-0.005 (-0.838)	-0.005 (-0.839)	0.001 (0.322)	0.001 (0.311)	0.064*** (4.375)	0.064*** (4.349)
<i>VC funding characteristics</i>						
ln(Syndicate size)	-0.253*** (-42.436)	-0.253*** (-42.391)	0.043*** (12.467)	0.043*** (12.424)	0.399*** (29.382)	0.400*** (29.418)
ln(Amt raised at first round)	-0.018*** (-5.155)	-0.018*** (-5.121)	0.008*** (4.002)	0.008*** (3.926)	-0.038*** (-4.587)	-0.038*** (-4.634)
<i>Patenting activity</i>						
ln(# Patents applied)	-0.081*** (-12.376)	-0.081*** (-12.318)	0.033*** (7.033)	0.032*** (6.938)	0.170*** (13.720)	0.170*** (13.694)
Observations	26,989	26,989	26,989	26,989	6,986	6,986
R-squared	0.394	0.394	0.200	0.204	0.423	0.422
Specification	OLS	OLS	OLS	OLS	OLS	OLS
Co's with MF investment	261	261	261	261	126	126
Stage level FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Lead VC FE	Yes	Yes	Yes	Yes	Yes	Yes
First VC round year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table A4: Mutual Fund investments and firm outcomes.

This table provides results of OLS regressions as benchmarks for the results in Tables 4 and 5. In Columns 1 – 2, the sample consists of VC-backed companies as described in Table 4. The dependent variable is the natural log of round size. In Columns 3 – 6, the sample consists of VC-backed companies as described in Table 5. The dependent variable equals one if a company does not exit via IPO or M&A over the subsequent 2 years (i.e., over the 2 years after the round) in cols 3 and 5, and the subsequent 3 years in cols 4 and 6. Across columns, we define a round as including mutual fund participation if $|\text{mutual fund reported acquisition date} - \text{Thomson Reuters round date}| < 30$ days. We use both the amount of capital raised from mutual funds and a dummy variable to measure mutual fund participation in financing rounds. All variables in log form represent the natural log of one plus the variable, and variables are calculated as of either the time of each round (firm characteristics) or the last quarter prior to the financing round (VC financing characteristics). Standard errors are clustered at the firm level, and t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

VARIABLES	(1) ln(Round size)	(2) ln(Round size)	(3) Active within 2 years	(4) Active within 3 years	(5) Active within 2 years	(6) Active within 3 years
ln(Amount raised from MF)	0.394*** (21.537)		-0.019 (-1.003)	-0.044** (-2.486)		
I(MF in round)		1.009*** (14.442)			-0.098** (-2.082)	-0.127*** (-2.846)
ln(VC firm age)	0.052*** (4.540)	0.054*** (4.691)	0.002 (0.217)	-0.000 (-0.046)	0.002 (0.228)	-0.000 (-0.048)
ln(# Companies funded)	-0.044*** (-4.026)	-0.043*** (-3.974)	-0.011 (-1.098)	-0.013 (-1.188)	-0.011 (-1.094)	-0.013 (-1.183)
ln(# Exits)	0.146*** (14.397)	0.145*** (14.271)	0.007 (0.733)	0.007 (0.715)	0.007 (0.726)	0.007 (0.717)
Time since first round	-0.005 (-1.340)	-0.005 (-1.423)	0.005 (1.425)	-0.003 (-0.801)	0.005 (1.415)	-0.003 (-0.805)
ln(Rounds received)	-0.452*** (-29.435)	-0.452*** (-29.365)	-0.152*** (-9.088)	-0.142*** (-7.629)	-0.152*** (-9.082)	-0.142*** (-7.626)
ln(# Investors)	0.051*** (3.504)	0.048*** (3.301)	-0.013 (-0.890)	-0.010 (-0.588)	-0.013 (-0.877)	-0.010 (-0.573)
ln(Amount raised)	0.368*** (44.462)	0.370*** (44.073)	-0.024*** (-3.591)	-0.031*** (-4.024)	-0.024*** (-3.570)	-0.031*** (-4.023)
ln(# Patents applied)	0.103*** (9.706)	0.102*** (9.599)	0.036*** (3.564)	0.044*** (3.574)	0.037*** (3.595)	0.045*** (3.598)
Inside round	-0.891*** (-102.923)	-0.891*** (-102.709)	-0.064*** (-9.367)	-0.048*** (-6.599)	-0.065*** (-9.418)	-0.048*** (-6.625)
Observations	45,757	45,757	21,151	20,774	21,151	20,774
R-squared	0.538	0.537	0.225	0.237	0.225	0.237
Stage level FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Financing round year FE	Yes	Yes	Yes	Yes	Yes	Yes
Lead VC FE	Yes	Yes	Yes	Yes	Yes	Yes

Table A5: Mutual Funds' likelihood of selling in IPO.

For each of the 1,365 IPOs in our sample, we determine whether there were any secondary shares sold, i.e., where any pre-IPO shareholders sold shares. We tabulate the percent of cases separately across companies with pre-IPO mutual fund investment versus no such investment. For the eight firms with both pre-IPO mutual fund investment and secondary share sales in the IPO, we attempt to determine whether the pre-IPO mutual fund investor sold any shares. If the mutual fund owned 5% or more of the company, meaning it will be listed as a principal shareholder in the IPO prospectus, we would be able to make this determinant. Of these eight firms, there is only one case in which the pre-IPO mutual fund investor is listed in the prospectus as a principal shareholder.

	With MF Inv't	% Shares Sold	Without MF Inv't
# IPOs	83		1,282
#IPOs with secondary sales	8 (9.6%)		388 (30.3%)
Pre-IPO MF listed in prospectus	1	100%	
Pre-IPO MF not listed in prospectus	7	Cannot be determined	

Table A6: Relation between round valuation errors and mutual fund participation.

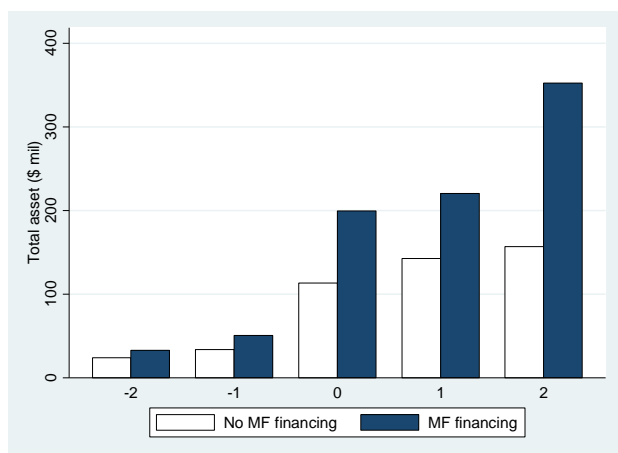
The sample constructed by combining round level data in Thomson Reuters data with round valuation data used in Gornall and Strebulaev (2018). We name-match on company names and round dates, which leaves us with 86 financing rounds. The dependent variable is $\Delta v = (\text{post-money valuation} - \text{fair value}) / \text{fair value}$, which represents the percentage by which the post-money valuation overstates the fair value. This variable is constructed and provided by Gornall and Strebulaev (2018). The independent variable of interest, MF in round, equals one if one or more mutual funds invested in the round, zero otherwise. We define a round as including mutual fund participation if the absolute value of the difference between the mutual fund's reported acquisition date and the Thomson Reuters's round date is less than 30 days. In column 4, we limit our analysis to companies that receive mutual fund investments at some point. Robust t-statistics are reported in parenthesis. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

VARIABLES	(1) Δv	(2) Δv	(3) Δv	(4) Δv
I(MF in round)	-0.097 (-1.241)	-0.066 (-0.919)	-0.055 (-0.785)	0.014 (0.151)
I(MF in previous round)			-0.199** (-2.210)	
I(MF in next round)				
ln(VC firm age)		0.090 (0.853)	0.101 (0.977)	0.219 (1.059)
ln(# Companies funded)		-0.151* (-1.690)	-0.143 (-1.571)	-0.117 (-0.523)
ln(# Exits)		0.040 (0.448)	0.034 (0.374)	-0.085 (-0.540)
Time since first round		-0.044** (-2.570)	-0.035** (-2.129)	-0.030 (-0.996)
ln(Rounds received)		0.163 (1.444)	0.179 (1.627)	-0.170 (-0.995)
ln(# Investors)		0.035 (0.354)	0.018 (0.177)	0.174 (1.108)
ln(Amount raised)		-0.205*** (-3.487)	-0.195*** (-3.153)	-0.122 (-1.321)
ln(# Patents applied)		0.146*** (2.970)	0.142*** (2.977)	0.096 (0.903)
Inside round		-0.132 (-1.594)	-0.160* (-1.862)	-0.059 (-0.482)
Observations	86	83	83	37
R-squared	0.014	0.557	0.580	0.564
Stage level FE	No	Yes	Yes	Yes
State FE	No	Yes	Yes	Yes
Industry FE	No	Yes	Yes	Yes
Financing round year FE	No	Yes	Yes	Yes

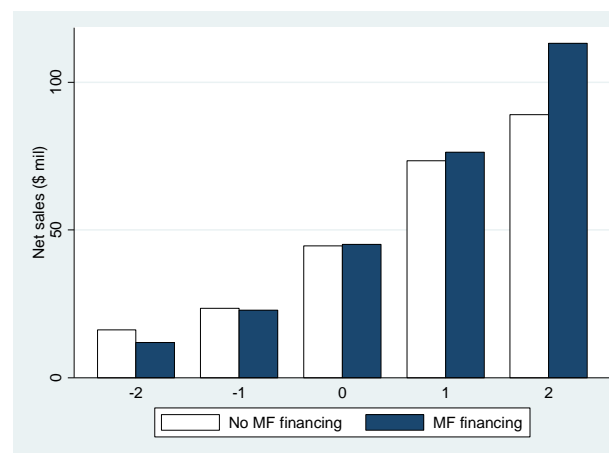
Figure A1: Types of private companies in which mutual funds invest.

The sample consists of the subset of VC-backed companies, as defined in Table 1, that went public in an IPO between 1997 – 2014 (due to the requirement of two years pre- and post-IPO data and the fact that the first company with mutual fund financing to exit via IPO was in in 1997). This yields a total of 994 IPOs, of which 58 received mutual fund investments prior to the IPO. The analysis is based on observations having non-missing values for each variable in Compustat. Panel A, B, C, and D show total assets, sales, expenditures (CAPEX + R&D + SG&A), and gross margin [(Sales – COGS) / Sales], respectively for each fiscal year. Year 0 is the year that includes the IPO. Data comes from Compustat and all numbers represent medians.

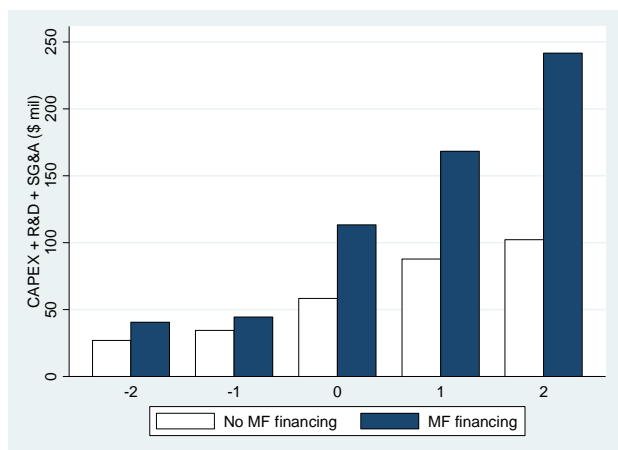
Panel A: Total assets



Panel B: Net sales



Panel C: Expenditures



Panel D: Gross margin

