

Varieties of Funds and Performance: The Case of Private Equity

(Online Appendix)

In tables A1-A7 presented below, we repeat the analysis of fund performance discussed in the paper for a sub-sample of funds with a General Partner (GP) located in the U.S.

Table A1: Descriptive statistics by vintage

Table A1 presents summary statistics for each vintage year for the funds in the sample with the general partner located in the U.S. The first column presents the vintage year. The second column presents the number of funds raised in each vintage. The third and fourth columns present the average performance in each vintage year across the funds in the sample, as measured by the mean internal rate of return and mean multiples of invested capital, respectively. The last column presents the average fund size per vintage year, calculated in 2013 U.S. dollars. All statistics are presented separately for each vintage as well as on aggregate for all vintages in the sample. The net IRR (%) and multiples of invested capital (x) for each fund are obtained from Preqin. Data span is between 1990 and 2013.

Vintage	Fund Observations	Fund mean IRR (%)	Fund mean multiple (X)	Fund mean size (USD mns)
1990	39	22.490	2.491	386.145
1991	19	27.526	2.521	377.401
1992	44	23.789	2.275	510.207
1993	52	26.146	2.502	310.779
1994	67	18.401	2.010	511.213
1995	81	19.019	1.916	452.914
1996	97	13.851	1.656	379.751
1997	115	13.850	1.694	640.124
1998	166	9.380	1.513	694.753
1999	167	7.043	1.457	736.873
2000	243	9.376	1.581	820.102
2001	168	12.642	1.686	657.069
2002	130	13.800	1.602	558.833
2003	118	13.976	1.647	699.735
2004	171	8.764	1.513	540.006
2005	279	6.847	1.426	841.990
2006	320	5.531	1.371	1168.840
2007	316	9.838	1.515	1276.633
2008	304	12.444	1.551	1096.863
2009	130	15.193	1.562	578.439
2010	197	15.329	1.535	637.176
2011	231	16.564	1.445	700.534
2012	205	16.539	1.312	955.797
2013	180	11.758	1.151	971.621
All vintages	3839	12.111	1.549	811.937

Table A2: Descriptive statistics by fund type

Table A2 presents summary statistics for each of the fourteen fund types identified. Panel A presents the number of funds with reported net IRR (*Obs*) as well as the mean, standard deviation (*Std. Dev.*), minimum (*Min*) and maximum (*Max*) performance as measured by the net IRR (%). Panel B presents the number of observations with reported multiples of invested capital (*Obs*), as well as the mean, standard deviation (*Std. Dev.*), minimum (*Min*) and maximum (*Max*) performance as measured by the multiples of invested capital (x). Panel C presents the number of observations with reported fund size (*Obs*), as well as the mean, standard deviation (*Std. Dev.*), minimum (*Min*) and maximum (*Max*) fund size as measured by fund values (in 2013 USD millions). All statistics are presented separately for each fund type as well as on aggregate for all funds in the sample. The net IRR (%) and multiples of invested capital (x) for each fund are obtained from Preqin. Data on funds with the general partner located in the U.S. Data span is between 1990 and 2013.

Fund Type	Panel A: Net IRR (%)					Panel B: Multiple (X)					Panel C: Fund Size (USD mns)				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Balanced	37	12.17	15.70	-19.00	63.70	37	1.78	0.99	0.56	5.20	37	2229.24	3670.58	1.46	16816.88
Buyout	838	14.72	13.55	-20.70	66.10	809	1.72	0.70	0.25	5.56	838	1432.74	2535.35	5.35	23360.93
Co-investment	74	14.68	14.86	-7.10	66.90	73	1.56	0.57	0.67	3.42	74	381.61	441.55	2.13	2294.22
Distressed & Turnaround	212	14.27	12.41	-15.60	69.00	195	1.57	0.57	0.54	5.07	212	1300.27	1555.51	12.33	11583.46
Early Stage	251	7.97	15.31	-19.40	62.00	243	1.46	0.85	0.24	5.59	251	259.32	352.09	2.07	3099.73
Expansion / Late Stage	55	7.64	12.12	-16.90	36.00	50	1.40	0.64	0.38	3.09	55	350.56	417.14	15.52	2624.00
Fund of Funds	468	10.61	8.52	-13.40	69.00	455	1.50	0.43	0.36	4.92	468	443.30	549.22	6.83	5864.10
Growth	125	12.24	13.22	-19.90	67.00	125	1.66	0.77	0.32	5.26	125	533.66	648.08	20.30	3441.34
Infrastructure	66	11.93	12.46	-14.20	46.80	62	1.48	0.55	0.60	3.58	66	1461.44	1673.19	5.47	8404.33
Mezzanine	172	10.55	7.62	-13.00	56.30	156	1.46	0.43	0.47	3.40	172	694.75	1347.92	13.54	14574.63
Natural Resources	116	15.12	16.54	-19.30	67.10	113	1.67	0.78	0.47	4.86	116	1155.44	1692.59	11.40	9374.10
Real Estate	856	11.67	12.38	-19.50	71.30	790	1.43	0.49	0.28	3.74	856	644.27	1016.86	1.46	12220.27
Secondaries	114	17.29	10.83	-6.30	45.10	114	1.54	0.38	0.81	3.30	114	877.64	1219.33	11.47	7487.16
Venture	455	9.60	16.73	-19.80	69.50	447	1.51	0.87	0.23	5.59	455	373.49	416.56	5.42	2982.49
All funds	3839	12.11	13.29	-20.70	71.30	3669	1.55	0.66	0.23	5.59	3839	811.94	1561.28	1.46	23360.93

Table A3: Differences between fund type mean performance

Table A3 presents pairwise differences in mean performance between the fourteen identified fund types. *Panel (a)* presents pairwise differences between mean IRRs. *Panel (b)* presents pairwise differences between mean multiples of invested capital (x). Statistical significance measured through Satterthwaite-Welch t-statistics assuming unequal variances. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively. The net IRR (%) and multiples of invested capital (x) for each fund are obtained from Preqin. Data on funds with the general partner located in the U.S. Data span is between 1990 and 2013.

Buyout	2.553													
Co-investment	2.508	-0.045												
Distressed & Turnaround	2.101	-0.452	-0.407											
Early Stage	-4.193	-6.746***	-6.701***	-6.294***										
Expansion / Late Stage	-4.524	-7.077***	-7.032***	-6.625***	-0.331									
Fund of Funds	-1.562	-4.115***	-4.070**	-3.662***	2.631**	2.962*								
Growth	0.077	-2.476*	-2.431	-2.024	4.270***	4.601**	1.639							
Infrastructure	-0.236	-2.789*	-2.744	-2.337	3.957**	4.288*	1.326	-0.313						
Mezzanine	-1.617	-4.170***	-4.125**	-3.718***	2.576**	2.907*	-0.055	-1.694	-1.381					
Natural Resources	2.949	0.396	0.441	0.848	7.142***	7.473***	4.510***	2.872	3.185	4.566***				
Real Estate	-0.501	-3.054***	-3.009*	-2.602***	3.692***	4.023**	1.060*	-0.579	-0.266	1.116	-3.450**			
Secondaries	5.125*	2.571**	2.616	3.024**	9.318***	9.648***	6.686***	5.047***	5.360***	6.742***	2.176	5.626***		
Venture	-2.570	-5.124***	-5.079***	-4.671***	1.623	1.954	-1.009	-2.648*	-2.335	-0.953	-5.519***	-2.069**	-7.695**	
	Balanced	Buyout	Co-investment	Distressed & Turnaround	Early Stage	Expansion / Late Stage	Fund of Funds	Growth	Infrastructure	Mezzanine	Natural Resources	Real Estate	Secondaries	

Table A3: Differences between fund type mean performance (cont'd)

Buyout	-0.058												
Co-investment	-0.224	-0.166**											
Distressed & Turnaround	-0.210	-0.151***	0.014										
Early Stage	-0.320*	-0.262***	-0.096	-0.110									
Expansion / Late Stage	-0.387**	-0.328***	-0.163	-0.177*	-0.067								
Fund of Funds	-0.281*	-0.223***	-0.057	-0.072	0.039	0.105							
Growth	-0.125	-0.066	0.099	0.085	0.195**	0.262**	0.157**						
Infrastructure	-0.301*	-0.242***	-0.077	-0.091	0.019	0.086	-0.020	-0.176*					
Mezzanine	-0.324*	-0.265***	-0.100	-0.114**	-0.004	0.063	-0.042	-0.199**	-0.023				
Natural Resources	-0.111	-0.052	0.113	0.099	0.209**	0.276**	0.171**	0.014	0.190*	0.213***			
Real Estate	-0.353**	-0.295***	-0.129*	-0.144***	-0.033	0.033	-0.072***	-0.229***	-0.052	-0.030	-0.243***		
Secondaries	-0.244	-0.185***	-0.020	-0.034	0.076	0.143	0.037	-0.119	0.057	0.080	-0.133	0.109***	
Venture	-0.277	-0.218***	-0.053	-0.067	0.043	0.110	0.004	-0.152*	0.024	0.047	-0.166**	0.076*	-0.033
	Balanced	Buyout	Co-investment	Distressed & Turnaround	Early Stage	Expansion / Late Stage	Fund of Funds	Growth	Infrastructure	Mezzanine	Natural Resources	Real Estate	Secondaries

Table A4: Fund type performance including vintage years

Table A4 investigates the relationship between fund type and fund performance. The dependent variable in all regressions is the measure of fund performance (net IRR or multiple of invested capital). In Model 1, fund performance is regressed on a constant, dummy variables identifying fund type (except for that capturing buyout funds which is kept as benchmark), dummies identifying vintage years (except for the one identifying vintage year 2003 which is kept as benchmark), dummy variables highlighting the region focus of the funds (except for the one identifying a focus on the U.S. region, which is kept as benchmark), the natural logarithm of fund size in 2013 USD mns ($LN(Fund\ Size)$) and the number within a sequence that a fund occupies within a private equity house ($Fund\ Sequence$). Model 2 is constructed in the same way as Model 1, with the difference that the fund size variable is replaced by dummy variables representing fund size brackets (except for the dummy capturing the smallest of funds, with fund values below USD 100 million, which is kept as benchmark). ***, ** and * denote significance at the 1%, 5% and 10% level, respectively. Data on funds with the general partner located in the U.S. Estimations use HAC standard errors.

Dependent Variable	Model 1		Model 2	
	IRR (%)	Multiple	IRR (%)	Multiple
Fund Types (benchmark: Buyout)				
Balanced	-3.845	-0.095	-4.027 *	-0.105
Co-Investment	-0.279	-0.129 *	-0.120	-0.113 *
Distressed & Turnaround	-0.923	-0.113 ***	-0.870	-0.108 **
Early Stage	-7.819 ***	-0.358 ***	-7.886 ***	-0.355 ***
Expansion / Late Stage	-7.793 ***	-0.433 ***	-7.707 ***	-0.420 ***
Fund of Funds	-4.144 ***	-0.231 ***	-4.047 ***	-0.224 ***
Growth	-2.553 **	-0.042	-2.422 *	-0.033
Infrastructure	-2.927 *	-0.163 **	-2.843 *	-0.160 **
Mezzanine	-4.989 ***	-0.316 ***	-4.822 ***	-0.309 ***
Natural Resources	-0.137	-0.053	-0.051	-0.048
Real Estate	-3.288 ***	-0.264 ***	-3.173 ***	-0.254 ***
Secondaries	1.646	-0.204 ***	1.684	-0.198 ***
Venture	-6.407***	-0.343 ***	-6.358 ***	-0.337 ***
Vintage (Benchmark: 2003)				
1990	7.970 ***	0.793 ***	7.746 ***	0.780 ***
1991	13.526 ***	0.856 ***	13.670 ***	0.856 ***
1992	9.509 ***	0.574 ***	9.372 ***	0.570 ***
1993	11.952 ***	0.818 ***	12.069 ***	0.824 ***
1994	3.597 *	0.304 **	3.492	0.298 **
1995	4.220**	0.221 **	4.147 **	0.219 **
1996	-0.260	-0.009	-0.173	-0.008
1997	-0.136	0.028	-0.127	0.025
1998	-4.595 ***	-0.146 *	-4.539 ***	-0.144 *
1999	-6.166***	-0.164 **	-6.024 ***	-0.157 **
2000	-3.726 **	-0.045	-3.559 **	-0.040
2001	-0.380	0.078	-0.273	0.083
2002	-0.043	-0.042	0.197	-0.030
2004	-5.174 ***	-0.139 *	-5.176 ***	-0.139 *
2005	-6.894***	-0.216***	-6.711 ***	-0.209 ***
2006	-7.944 ***	-0.253 ***	-7.889 ***	-0.253 ***
2007	-3.638 ***	-0.112 *	-3.567 ***	-0.112 *
2008	-1.334	-0.087	-1.357	-0.088
2009	1.524	-0.085	1.599	-0.084
2010	1.331	-0.114 *	1.485	-0.108 *
2011	2.725*	-0.210 ***	2.806**	-0.209 ***
2012	2.235	-0.354***	2.294	-0.355 ***
2013	-2.386	-0.497 ***	-2.334	-0.497 ***
Region (benchmark: U.S.)				
Americas	-8.554 ***	-0.377 ***	-8.581 ***	-0.375 ***
Asia	-0.399	-0.033	-0.321	-0.033
Australasia	-16.329***	-0.643 ***	-16.129 **	-0.626 ***
Diversified Multi-Region	-4.687 *	-0.163	-4.773 *	-0.162
Europe	-1.416	-0.108 **	-1.423	-0.107 **
Size Variable				
LN (Fund Size)	-0.886***	-0.060 ***		
Size Brackets (benchmark: <\$100mn)				
\$100mn_ \$250mn			-2.814 ***	-0.103 ***
\$250mn_ \$500mn			-2.658 ***	-0.145 ***
\$500mn_ \$1bn			-4.346 ***	-0.241 ***
\$1bn_ \$3bn			-4.589 ***	-0.267 ***
>\$3bn			-3.691 ***	-0.208 ***
Constant	22.243 ***	2.191 ***	19.852 ***	1.984 ***
Fund sequence	-0.024	0.002	-0.024	0.001
F-stat	16.182 ***	17.739 ***	15.324 ***	16.622 ***
Adj. R-squared	0.1454	0.1640	0.1492	0.167
Observations	3839	3669	3839	3669

Table A6: Fund type performance using fund type and vintage year bracket interaction terms

Table A6 examines the relationship between fund type and fund performance during different time periods by interacting the fund type and vintage bracket dummy variables. The dependent variable is the measure of fund performance (net IRR and multiples of invested capital). In Model 5(a) the independent variables are: a constant, fourteen interaction terms between the dummy variable capturing funds raised between 1990 and 2002 and, in turn, the fourteen dummies capturing fund type, dummy variables capturing funds' region focus, the natural logarithm of fund size ($LN(Fund\ Size)$), and the sequence of a fund in a private equity house ($Fund\ sequence$). Model 5(b) is constructed similarly to Model 5(a), with the difference that the fund type dummy variables are now interacted with the dummy variable capturing funds raised between 1990 and 2008. Model 6(a) and 6(b) are constructed as Models 5(a) and 5(b), respectively, but investigate fund size as captured by fund size brackets. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively. Data on funds with the general partner located in the U.S. All estimations use HAC standard errors.

Dependent Variable	Model 5(a)		Model 5(b)		Model 6(a)		Model 6(b)	
	IRR (%)	Multiple	IRR (%)	Multiple	IRR (%)	Multiple	IRR (%)	Multiple
Fund Type* Vintage Bracket								
Balanced_1990_2002	2.479	0.439 **			2.141	0.418 **		
Buyout_1990_2002	4.328 ***	0.447 ***			4.373 ***	0.450 ***		
Co-Investment_1990_2002	2.228	0.288			2.300	0.291		
Dist & Turn_1990_2002	6.689 ***	0.469 ***			7.035 ***	0.488 ***		
Early Stage_1990_2002	-6.099 ***	-0.090			-6.320 ***	-0.099		
Expansion/LS_1990_2002	-3.777	-0.054			-3.683	-0.048		
Fund of Funds_1990_2002	-0.846	0.204 ***			-0.866	0.203 ***		
Growth_1990_2002	1.127	0.402 ***			1.177	0.403 ***		
Infrastructure_1990_2002	5.990 **	0.701 ***			6.452 **	0.715 ***		
Mezzanine_1990_2002	-0.482	0.059			-0.350	0.069		
Nat.Res._1990_2002	10.734 ***	0.666 ***			10.717 ***	0.665 ***		
Real Estate_1990_2002	4.342 ***	0.259 ***			4.328 ***	0.262 ***		
Secondaries_1990_2002	7.336 ***	0.199 ***			7.362 ***	0.205 ***		
Venture_1990_2002	-2.350 *	0.059			-2.336 *	0.059		
Balanced_1990_2008			-1.352	0.502 ***			-1.601	0.488 ***
Buyout_1990_2008			-0.371	0.455 ***			-0.468	0.450 ***
Co-Investment_1990_2008			-5.946 ***	0.105			-5.872 ***	0.113
Dist & Turn_1990_2008			0.324	0.373 ***			0.322	0.374 ***
Early Stage_1990_2008			-10.373 ***	-0.024			-10.549 ***	-0.028
Expansion/LS_1990_2008			-9.914 ***	-0.071			-9.854 ***	-0.062
Fund of Funds_1990_2008			-5.422 ***	0.167 ***			-5.421 ***	0.168 ***
Growth_1990_2008			-4.372 ***	0.347 ***			-4.341 ***	0.348 ***
Infrastructure_1990_2008			-3.169 *	0.260 **			-3.194 *	0.257 **
Mezzanine_1990_2008			-5.495 ***	0.083 **			-5.466 ***	0.084 **
Nat.Res._1990_2008			2.796 *	0.462 ***			2.736 *	0.461 ***
Real Estate_1990_2008			-5.834 ***	0.026			-5.797 ***	0.031
Secondaries_1990_2008			0.478	0.191 ***			0.440	0.194 ***
Venture_1990_2008			-7.654 ***	0.063			-7.700 ***	0.063
Region (benchmark: U.S.)								
Americas	-7.900 ***	-0.352 ***	-9.121***	-0.366 ***	-7.880 ***	-0.349 ***	-9.132 ***	-0.365 ***
Asia	-1.290	-0.063	-0.598	-0.028	-1.272	-0.064	-0.515	-0.028
Australasia	-15.296 ***	-0.610 ***	-15.113 ***	-0.436 **	-14.985 ***	-0.593 ***	-14.837 ***	-0.419 **
Diversified Multi-Region	-4.586 **	-0.129	-5.906 **	-0.203 **	-4.593 *	-0.126	-5.987 ***	-0.202 **
Europe	-2.098 **	-0.094 **	-1.656	-0.117 ***	-2.077 **	-0.093 **	-1.641	-0.115 ***
Size Variable								
LN (Fund Size)	-0.915 ***	-0.056 ***	-1.286 ***	-0.082 ***				
Size Brackets (benchmark: <\$100mn)								
\$100mn_250mn					-2.789 ***	-0.120 ***	-3.297 ***	-0.130 ***
\$250mn_500mn					-3.051***	-0.164 ***	-3.571 ***	-0.196 ***
\$500mn_1bn					-4.948 ***	-0.262 ***	-5.624 ***	-0.302***
\$1bn_3bn					-5.033 ***	-0.282 ***	-6.128 ***	-0.351 ***
>\$3bn					-3.062 ***	-0.165 ***	-5.657 ***	-0.321 ***
Constant	16.970 ***	1.801 ***	23.349 ***	1.892 ***	14.759 ***	1.636 ***	19.664 ***	1.615 ***
Fund sequence	0.024	-0.002	-0.071 **	-0.002 *	0.026	-0.002	-0.071 **	-0.002 *
F-stat	9.250 ***	16.262 ***	15.590 ***	17.442 ***	9.000 ***	14.908 ***	14.201 ***	15.418 ***
Adj. R-squared	0.0432	0.0804	0.0739	0.0860	0.0495	0.0866	0.0792	0.0895
Observations	3839	3669	3839	3669	3839	3669	3839	3669

Table A7: Mean fund performance and variability in performance

Table A7 illustrates average fund performance (as measured by the mean internal rate of return and mean multiple of invested capital) and variability in performance (as measured by the standard deviation of the internal rate of return and multiple of invested capital per fund type) in decreasing order (from the largest values to the lowest) per fund type. The table displays an ordering of fund types according to the four selected criteria. Numerical values for each criterion for each of the fourteen fund types are presented in Table 3. Data on funds with the general partner located in the U.S. Data span is between 1990 and 2013.

Criteria (Large to Small)	Mean IRR	Mean Multiple	Standard Deviation IRR	Standard Deviation Multiple
1	Secondaries	Balanced	Venture	Balanced
2	Natural Resources	Buyout	Natural Resources	Venture
3	Buyout	Natural Resources	Balanced	Early Stage
4	Co-investment	Growth	Early Stage	Natural Resources
5	Distressed & Turnaround	Distressed & Turnaround	Co-investment	Growth
6	Growth	Co-investment	Buyout	Buyout
7	Balanced	Secondaries	Growth	Expansion / Late Stage
8	Infrastructure	Venture	Infrastructure	Co-investment
9	Real Estate	Fund of Funds	Distressed & Turnaround	Distressed & Turnaround
10	Fund of Funds	Infrastructure	Real Estate	Infrastructure
11	Mezzanine	Early Stage	Expansion / Late Stage	Real Estate
12	Venture	Mezzanine	Secondaries	Fund of Funds
13	Early Stage	Real Estate	Fund of Funds	Mezzanine
14	Expansion / Late Stage	Expansion / Late Stage	Mezzanine	Secondaries