Internet Appendix: Corporate Venture Capital and Firm Scope

Yifei Zhang*

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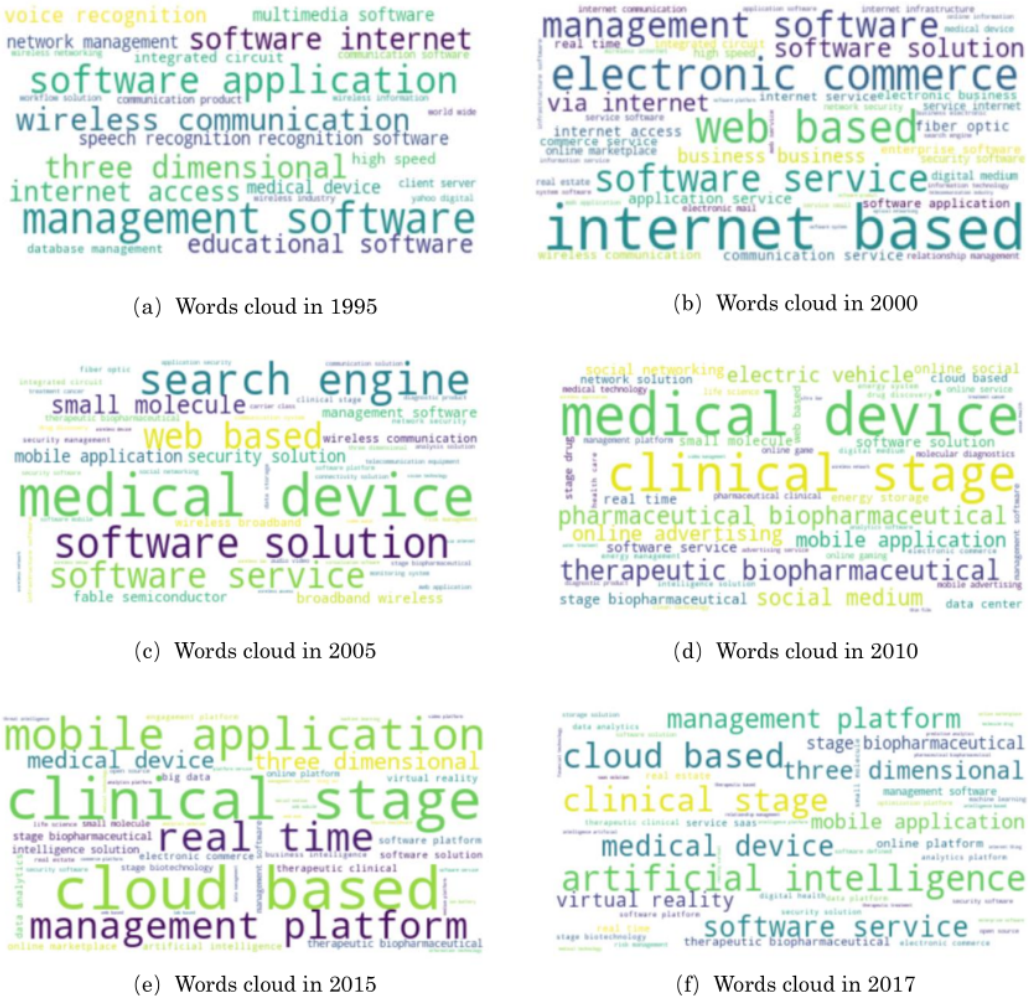
*Affiliation: Toulouse School of Economics. yifei.zhang@tse-fr.eu

Figure 1. The VC-backed Startups' "Emerging Phrases"



(a) Words cloud in 1995

(b) Words cloud in 2000

(c) Words cloud in 2005

(d) Words cloud in 2010

(e) Words cloud in 2015

(f) Words cloud in 2017

The figure presents six word clouds about VC-backed startups' "emerging phrases" used in the analysis of firm scope change. Emerging phrases are the top 5% most frequently-used word pairs (excluding stopwords and common words) in the detailed business descriptions of all VC-backed startups receiving VC funding in a given year. Notably, the set of emerging phrases changes over year.

Table I: CVC Investments and Corporate Restructuring: Sample Before 1997

This table provides the robustness check of Table IV by using the sample before 1997 in the regressions. SFAS 131 regulation change in 1997 requires that managers report segments based on how managers themselves internally evaluate operating performance (management approach). Prior to this rule change, segment reporting was instead based on an industry approach. The regression design and sample construction follows Table IV.

Panel A: Creating new divisions	(1) Logit	(2) Logit	(3) CLogit	(4) CLogit
	D(Create New Division)[t+1,t+2]			
D(CVC)	0.290*		0.280	
	(1.77)		(1.54)	
D(CVC Unrelated)		0.460***		0.443**
		(2.70)		(2.38)
D(CVC Related)		-0.341		-0.280
		(-0.91)		(-0.72)
D(New Div.)[t-2,t-1]	0.249***	0.248***	0.278***	0.277***
	(4.41)	(4.38)	(4.54)	(4.52)
Firm Controls:	Firm Size, Tobin's Q, ROA, R&D, Leverage, Capx., HHI, D(Conglomerate)			
Year Fixed Effect	Yes	Yes	No	No
Industry Fixed Effect	Yes	Yes	No	No
Industry*Year Fixed Effect	No	No	Yes	Yes
Num. Obs.	42,340	42,340	41,078	41,078
Pseudo R^2	0.098	0.098	0.043	0.043

Panel B: Removing old divisions	(1) Logit	(2) Logit	(3) CLogit	(4) CLogit
	D(Remove Old Division)[t+1,t+2]			
D(CVC)	0.353**		0.332*	
	(2.10)		(1.80)	
D(CVC Unrelated)		0.507***		0.473**
		(2.61)		(2.26)
D(CVC Related)		-0.403		-0.338
		(-1.05)		(-0.91)
D(Div. Rem.)[t-2,t-1]	0.249***	0.248***	0.281***	0.280***
	(4.90)	(4.87)	(5.12)	(5.11)
Firm Controls:	Firm Size, Tobin's Q, ROA, R&D, Leverage, Capx., HHI, D(Conglomerate)			
Year Fixed Effect	Yes	Yes	No	No
Industry Fixed Effect	Yes	Yes	No	No
Industry*Year Fixed Effect	No	No	Yes	Yes
Num. Obs.	42,340	42,340	41,540	41,540
Pseudo R^2	0.200	0.200	0.188	0.188

Panel C: Changing the primary business (industry)

	(1) CLogit	(2) CLogit	(3) CLogit	(4) CLogit
	D(Chg.Ind.)[t+3,t+5]		D(Chg.Ind.)[t+4,t+6]	
D(CVC)	0.194		0.212	
	(0.79)		(0.82)	
D(CVC Unrelated)		0.373*		0.399*
		(1.94)		(1.96)
D(CVC Related)		-0.214		-0.265
		(-1.10)		(-0.99)
D(Chg.Ind.)[t-2,t-1]	0.842***	0.843***	0.824***	0.825***
	(10.68)	(10.69)	(9.94)	(9.96)
Firm Controls:	Firm Size, Tobin's Q, ROA, R&D, Leverage, Capx., HHI, D(Conglomerate)			
Industry*Year Fixed Effect	Yes	Yes	Yes	Yes
Num. Obs.	32,888	32,888	30,527	30,527
Pseudo R^2	0.082	0.083	0.080	0.080

Table II: CVC Investments and Corporate Restructuring: Post-1997 Sample

This table provides the robustness check of Table IV by using the post-1997 sample in the regressions. SFAS 131 regulation change in 1997 requires that managers report segments based on how managers themselves internally evaluate operating performance (management approach). Prior to this rule change, segment reporting was instead based on an industry approach. The regression design and sample construction follows Table IV.

Panel A: Creating new divisions

	(1) Logit	(2) Logit	(3) CLogit	(4) CLogit
	D(Create New Division)[t+1,t+2]			
D(CVC)	0.432***		0.430**	
	(2.88)		(2.46)	
D(CVC Unrelated)		0.620***		0.629***
		(3.48)		(3.17)
D(CVC Related)		-0.249		-0.296
		(-0.90)		(-1.01)
D(New Div.)[t-2,t-1]	0.126*	0.126*	0.0990	0.0995
	(1.72)	(1.73)	(1.20)	(1.21)
Firm Controls:	Firm Size, Tobin's Q, ROA, R&D, Leverage, Capx., HHI, D(Conglomerate)			
Year Fixed Effect	Yes	Yes	No	No
Industry Fixed Effect	Yes	Yes	No	No
Industry*Year Fixed Effect	No	No	Yes	Yes
Num. Obs.	43,903	43,903	41,658	41,658
Pseudo R^2	0.058	0.058	0.017	0.018

Panel B: Removing old divisions

	(1) Logit	(2) Logit	(3) CLogit	(4) CLogit
	D(Remove Old Division)[t+1,t+2]			
D(CVC)	0.347***		0.324**	
	(2.70)		(2.10)	
D(CVC Unrelated)		0.521***		0.494***
		(3.12)		(2.71)
D(CVC Related)		-0.159		-0.161
		(-0.66)		(-0.66)
D(Div. Rem.)[t-2,t-1]	0.203***	0.205***	0.197***	0.198***
	(3.15)	(3.19)	(2.90)	(2.93)
Firm Controls:	Firm Size, Tobin's Q, ROA, R&D, Leverage, Capx., HHI, D(Conglomerate)			
Year Fixed Effect	Yes	Yes	No	No
Industry Fixed Effect	Yes	Yes	No	No
Industry*Year Fixed Effect	No	No	Yes	Yes
Num. Obs.	43,903	43,903	42,407	42,407
Pseudo R^2	0.187	0.188	0.165	0.165

Panel C: Changing the primary business (industry)

	(1) CLogit	(2) CLogit	(3) CLogit	(4) CLogit
	D(Chg.Ind.)[t+3,t+5]		D(Chg.Ind.)[t+4,t+6]	
D(CVC)	0.547**		0.483*	
	(2.13)		(1.82)	
D(CVC Unrelated)		0.541*		0.546**
		(1.96)		(1.98)
D(CVC Related)		-0.143		-0.231
		(-0.40)		(-0.61)
D(Chg.Ind.)[t-2,t-1]	1.076***	1.077***	1.074***	1.075***
	(12.13)	(12.14)	(11.38)	(11.40)
Firm Controls:	Firm Size, Tobin's Q, ROA, R&D, Leverage, Capx., HHI, D(Conglomerate)			
Industry*Year Fixed Effect	Yes	Yes	Yes	Yes
Num. Obs.	27,303	27,303	23,818	23,818
Pseudo R^2	0.106	0.106	0.097	0.097

Table III: CVC Investments and Corporate Restructuring: Texual-based Segments

This table conducts robustness check of Table IV by using the textual-based segments to construct two restructuring dummies (divisions creation and removal). The procedure of construction closely follows Hoberg and Phillips (2020), where I use the industry description text extracted from the 1987 Standard Industry Classification Manual and calculate the overlap between each SIC-3 industry and each 10-K Item 1. Details could be found in Hoberg and Phillips (2020).

Conditional Logit	(1)	(2)	(3)	(4)	(5)	(6)
	Textual-based Segment Restructuring Dummies					
	D(New Division) [t+1,t+2]			D(Division Removal) [t+1,t+2]		
D(CVC)	0.311***			0.262***		
	(3.70)			(2.74)		
D(CVC Unrelated)		0.369***	0.413**		0.270**	0.182
		(3.40)	(2.05)		(2.53)	(1.22)
D(CVC Related)		0.0180	-0.183		0.130	0.0832
		(0.13)	(-0.80)		(0.84)	(0.50)
Firm-level Controls	Firm Size, Tobin's Q, ROA, R&D, Leverage, Cash, Sales Growth, Capx., HHI, D(Conglomerate), Firm Age, 10-K (Item 1) Text Length					
Year × Industry F.E.	✓	✓		✓	✓	
Year F.E.			✓			✓
Firm F.E.			✓			✓
Num. Obs.	33,309	33,309	23,519	47,587	47,587	25,299
Pseudo R^2	0.009	0.009	0.035	0.020	0.020	0.067

Table IV: Coefficients in the Regressions of Figure 6

This table reports detailed coefficients of regressions in Figure II.

$$D[Restructuring]_{i,t} = \sum_{k=-3}^{+5} \gamma_k D(CVC\ Unr; k)_{i,t} + \sum_{k=-3}^{+5} \alpha_k D(CVC\ Rel; k)_{i,t} + \beta \mathbf{X} + \tau_i + \upsilon_t + \varepsilon_{i,t}$$

where $D[Restructuring]$ denotes three restructuring dummies regarding creating a new division, removing an old division, and changing the corporate primary industry, respectively, measured in Year t. $\left\{D(CVC\ Unr; k)\right\}_{k=-3}^{+5}$ is a bunch of dummies equal to 1 if the year is k years before or after each CVC unrelated deal. A similar setup applies to $\left\{D(CVC\ Rel; k)\right\}_{k=-3}^{+5}$ for CVC related deals. Firm and year fixed effects are included in all regressions. Standard errors are clustered at the firm level. $\mathbf{X}$ includes Firm Size, Tobin's Q, ROA, R&D, Leverage, Capx., Cash, Sales Growth, HHI, Firm Age, and D(Conglomerate)(lagged).

		-3	-2	-1	0	$+1$	$+2$	$+3$	$+4$	$+5$	pseudo R^2	Num. Obs.
						Unrelated CVC deal dummies						
New Division	coefficients	0.004	-0.112	0.035	-0.061	0.436	0.130	0.366	-0.254	0.139	0.061	27,543
	t-stat	0.025	-0.675	0.203	-0.383	2.408	0.749	2.208	-1.192	0.716		
Division Removal	coefficients	-0.157	-0.074	-0.128	-0.262	0.239	0.249	0.140	0.043	-0.144	0.102	27,514
	t-stat	-0.973	-0.406	-0.686	-1.489	1.242	1.664	0.821	0.260	-0.897		
Change Industry	coefficients	-0.184	-0.047	-0.103	-0.145	0.038	-0.127	-0.032	0.185	0.681	0.052	16,235
	t-stat	-0.610	-0.149	-0.307	-0.560	0.143	-0.443	-0.138	0.946	3.233		
						Related CVC deal dummies						
New Division	coefficients	-0.127	0.693	0.033	0.099	0.221	-0.388	-0.474	-0.070	0.311	0.061	27,543
	t-stat	-0.493	2.896	0.124	0.347	0.756	-1.462	-1.469	-0.221	1.110		
Division Removal	coefficients	0.093	-0.144	-0.226	0.765	-0.338	-0.038	-0.198	0.154	0.055	0.102	27,514
	t-stat	0.351	-0.541	-0.750	3.018	-1.380	-0.151	-0.715	0.501	0.183		
Change Industry	coefficients	0.120	-0.429	1.158	-0.142	-1.023	1.084	-0.377	0.175	-0.988	0.052	16,235
	t-stat	0.309	-1.108	2.632	-0.399	-2.334	2.474	-0.855	0.434	-1.815		

Table V: Discrete Choice Model – the Choice of Entrepreneurial Startups

This table presents the estimate of a discrete choice model regarding the choice of portfolio companies by the CVC programs. The unit of observation is at the (CVC firm)-year-(start-up) level. Each observation represents an alternative (Start-up h) which CVC Firm i in Year t could invests. The decision-makers are defined as those CVC firm-year pairs which actively source deals. The set of alternatives consists of all start-ups (entrepreneurial companies in VentureXpert) actively seeking funding in Year t. The dependent variable is equal to 1 if the start-up is chosen by the Firm i in Year t. The main control, Invested by Connected IVCs with Inflow Shocks, is a dummy equal to 1 if the start-up receives funding in Year t from an IVC in the past syndicate network of CVC Firm i, and meanwhile, the connected IVC recently receives a new positive fund inflow shock. All the coefficients are multiplied by 100 for readability. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels respectively.

	(1) D(CVC)	(2) D(CVC Initial)	(3) D(CVC)	(4) D(CVC Initial)
Invested by Connected IVCs with Inflow Shocks	0.315***	0.118***	0.315***	0.118***
	(7.61)	(3.92)	(8.12)	(4.88)
Invested by Connected IVCs	0.456***	0.142***	0.456***	0.142***
	(19.23)	(8.71)	(20.98)	(11.03)
Invested by Any IVCs with Inflow Shocks	-0.0944***	-0.0501***	-0.0944***	-0.0501***
	(-14.87)	(-10.93)	(-21.56)	(-14.09)
Num. Co-investors in the Round	0.0438***	0.0275***	0.0438***	0.0275***
	(17.02)	(15.75)	(26.00)	(23.77)
Start-up's Age in the Round	-0.000520***	-0.000716***	-0.000520***	-0.000716***
	(-3.14)	(-4.93)	(-2.82)	(-5.15)
Related Deal	0.210***	0.140***	0.210***	0.140***
	(16.60)	(15.04)	(17.41)	(19.97)
Num. Non-Stop Flights between CVC and Start-up	0.00129**	0.00111***	0.00129**	0.00111***
	(2.53)	(2.82)	(2.04)	(2.88)
Start-up in the Same Area with CVC	0.191***	0.142***	0.191***	0.142***
	(10.38)	(10.04)	(10.01)	(12.19)
Distance between CVC and Start-up (Thousand Miles)	-0.0118***	-0.00796***	-0.0118***	-0.00796***
	(-6.00)	(-5.20)	(-6.02)	(-6.95)
Firm by Year F.E.	YES	YES	YES	YES
Start-up Stage F.E.	YES	YES	YES	YES
S.E. clustered at	Firm-Year	Firm-Year	Start-up	Start-up
Num. Obs.	4297514	4297514	4297514	4297514
Adj. R^2	0.009	0.005	0.009	0.005

Table VI: Robustness Check of Table X: Without Firm Fixed Effect

This table studies the post CVC investments value creation of corporate parents. The dependent variable is the difference of Tobin's Q between Year t+3 (t+4 for the even-valued columns) and Year t. Tobin's Q is adjusted by its Industry-Year median (Industry defined as SIC-2) before calculating the difference. For control variable regarding CVC investments, it is broadly divided into 2 variables: (1) D(CVC Related), a dummy equal to 1 if the firm conducts at least one CVC deal of which start-up's SIC-3 code can be matched with one of its segments reported in Year t-1; (2) D(CVC Unrelated), a dummy equal to 1 if the firm conducts at least one CVC deal of which start-up's SIC-3 cannot be matched with any of its segments reported in Year t-1. Industry fixed effects are defined in SIC-2 industries. T-statistics are shown in parentheses, and standard errors are clustered by firm. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Change of Tobin's Q of the CVC Parent					
Δ =	(t+3)-t	(t+4)-t	(t+3)-t	(t+4)-t	(t+3)-t	(t+4)-t	(t+5)-t	(t+6)-t
D(CVC Unrelated)	0.283***	0.283***						
	(3.22)	(2.98)						
D(CVC Related)	-0.179	-0.249	-0.174	-0.243	-0.180	-0.250	-0.252	-0.180
	(-1.00)	(-1.24)	(-0.97)	(-1.21)	(-1.01)	(-1.25)	(-1.11)	(-0.78)
D(CVC Unrelated)*D(New Seg.)[t+1,t+2]			0.468***	0.462***				
			(5.30)	(5.96)				
D(CVC Unrelated)*(1-D(New Seg.)[t+1,t+2])			0.239**	0.236**				
			(2.28)	(2.04)				
D(CVC Unrelated)*D(Seg. Rem.)[t+1,t+2]					0.455***	0.448***		
					(5.26)	(5.56)		
D(CVC Unrelated)*(1-D(Seg. Rem.)[t+1,t+2])					0.239**	0.240**		
					(2.31)	(2.10)		
D(CVC Unrelated)*D(Chg. Ind.)[t+3,t+5]							0.320**	0.313**
							(2.45)	(2.05)
D(CVC Unrelated)*(1-D(Chg. Ind.)[t+3,t+5])							0.251**	0.270***
							(2.11)	(2.72)
Firm Controls	Firm Size; ROA; Cash; R&D; Leverage; Capital Exp.; HHI; D(Conglomerate)							
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm F.E.	No	No	No	No	No	No	No	No
F Test								
Break Down of D(CVC Unrelated)			3.24*	2.99*	3.07*	2.49	4.32**	5.20***
Num. Obs.	74,128	65,292	74,128	65,292	74,128	65,292	57,747	51,249
Adj. R^2	0.081	0.077	0.081	0.077	0.081	0.077	0.084	0.071

REFERENCES

Hoberg, Gerard, and Gordon M. Phillips, 2020, Scope, Scale and Competition: The 21st Century Firm, *Available at SSRN* .