



THE LINK BETWEEN COWORKING SPACE DEMAND AND VENTURE CAPITAL FINANCING

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Coworking spaces are used from freelancers, start-ups and corporates

Defining the term coworking

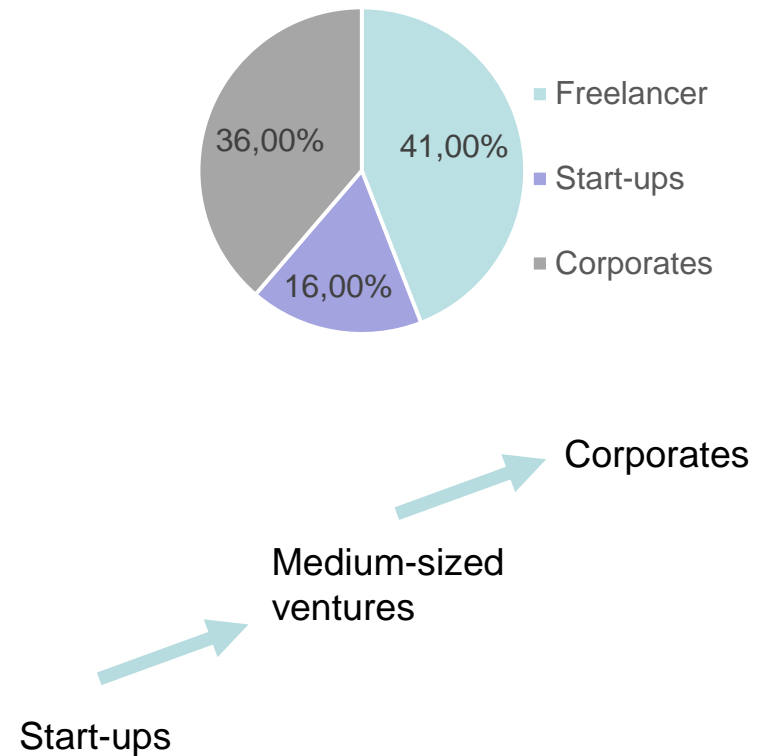
Socio-economic perspective:

Coworking is the flexible working of largely independent knowledge workers in a common, institutionalized place. The non-hierarchical social network enables the participants and ventures to cooperate and collaborate in a variety of ways.

Real-Estate perspective:

Coworking is the business model of providing flexible workspace. Operators rent long term office premises and sublease short-term (maturity transformation).

User of coworking spaces



Source: Gauger, Pfnür (2019); Bauer, Stiefel, Rief (2017)

Theoretical relevance of the research study

Author	Finding
McCoy 2005	Real-estate costs represent the second largest cost factor for ventures
Riemer et al. 2019	Flexible office space provides tangible and intangible resources in the entrepreneurial landscape
Hyytinen et al. 2014	Supporting entrepreneurial environments reduce startup failure and help ventures focus on their business needs
Feldmann, Kogler 2010	Location matters most at the earliest stage of the industry life cycle; Innovation is spatially concentrated
Assenza 2015	Influence of spatial configuration on knowledge spillover in entrepreneurial coworking spaces
Samila, Sorenson 2011	Venture capital contributes to innovation and entrepreneurship
Bathelt, Cohendet 2014	Business creation is strongly supported by communities of practice
Miloud et al. 2012	The importance of external relationships of new ventures affecting valuation by venture capitalists

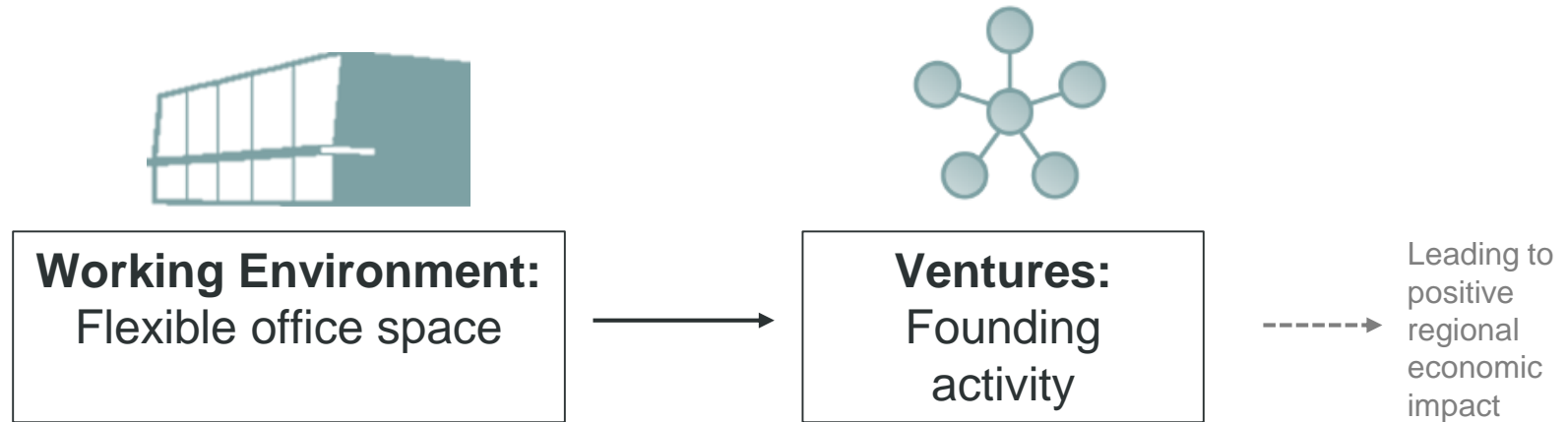
Research gap

The relation between the spatial entrepreneurial environment and founding of ventures

„Although the number of incubators, accelerators, coworking spaces and science parks is rapidly increasing around the world, little academic attention has been paid to the start-up communities that these initiatives create“

(van Weele, Van Rijnsoever, and Steinz 2014)

Research Question



Research Question:

RQ1: Is there a relation between the supply of office infrastructure (flexible office space) and founding activities of ventures in a region?

RQ2: Is there a relation between the supply of flexible office space and the type of venture? (financing of firm)

Research approach

Literature Review

Real estate literature: Flexible office space concepts & characteristics

Start-up/entrepreneurial literature: Founding activities and financing of ventures

Conceptual model

Data collection of coworking spaces

- Manually collected panel data (number, size & founding date of CWS in big 7 cities in Germany)
- Web Crawler using Google Maps data for coworking spaces
- Extraction of founding date (year), size (sqm) and status (operating) of coworking space
- Using a second webcrawler for the first google review as a proxy for the founding date

Data collection of funding capital

- Granting application for a research account using Crunchbase as database for venture capital for start-ups
- Collecting capital flows (amount, rounds and type of capital) and foundings through a Rest API from Crunchbase for all ventures listed in crunchbase

Econometric analysis

- Regression analysis with a panel dataset of 9 years from 2010 – 2018 (using Stata)
- Robustness checks:
 - Non-alike CWS firms as control variable
 - Controls for various real-estate factors

Panel of German Big 7 Cities

Growth rate (number) and size [in sqm] of Coworking Spaces per year



City	2010	2011	2012	2013	2014	2015	2016	2017	2018	Sum
Berlin	(2) 600	(4) 2.200	(6) 50.277	(18) 5.247	(30) 10.601	(12) 10.363	(38) 52.021	(41) 51.303	(50) 29.149	(195) 208.961
Hamburg	(5) 4.000	(10) 9.000	(8) 6.000	(5) 4.000	(5) 4.000	(2) 1.536	(20) 14.170	(17) 27.821	(15) 42.782	(87) 113.309
Frankfurt	(5) 11.000	(4) 5.500	(5) 6.500	(5) 7.000	(7) 7.500	(8) 8.200	(7) 7.350	(12) 22.000	(9) 22.000	(62) 97.050
Cologne	(4) 4500	(5) 5000	(4) 7200	(5) 8500	(4) 7900	(3) 3000	(3) 2300	(7) 6000	(7) 11000	(42) 55.400
Stuttgart	(2) 1.700	(3) 1.800	(3) 2.300	(2) 1.600	(2) 1.500	(4) 5.500	(4) 4.800	(5) 7.000	(7) 10.500	(32) 36.700
Düsseldorf	(4) 4.500	(3) 4.900	(3) 5.000	(4) 6.500	(4) 6.800	(5) 7.000	(5) 7.000	(8) 11.000	(11) 14.000	(47) 66.700
Munich	(7) 5.500	(6) 6.000	(6) 6.000	(6) 5.800	(5) 5.200	(7) 8.200	(9) 11.000	(16) 25.000	(24) 65.000	(86) 137.700

Assumption: conservative approach
Source: Google maps crawler and manual research

Presumptions

Following, we use

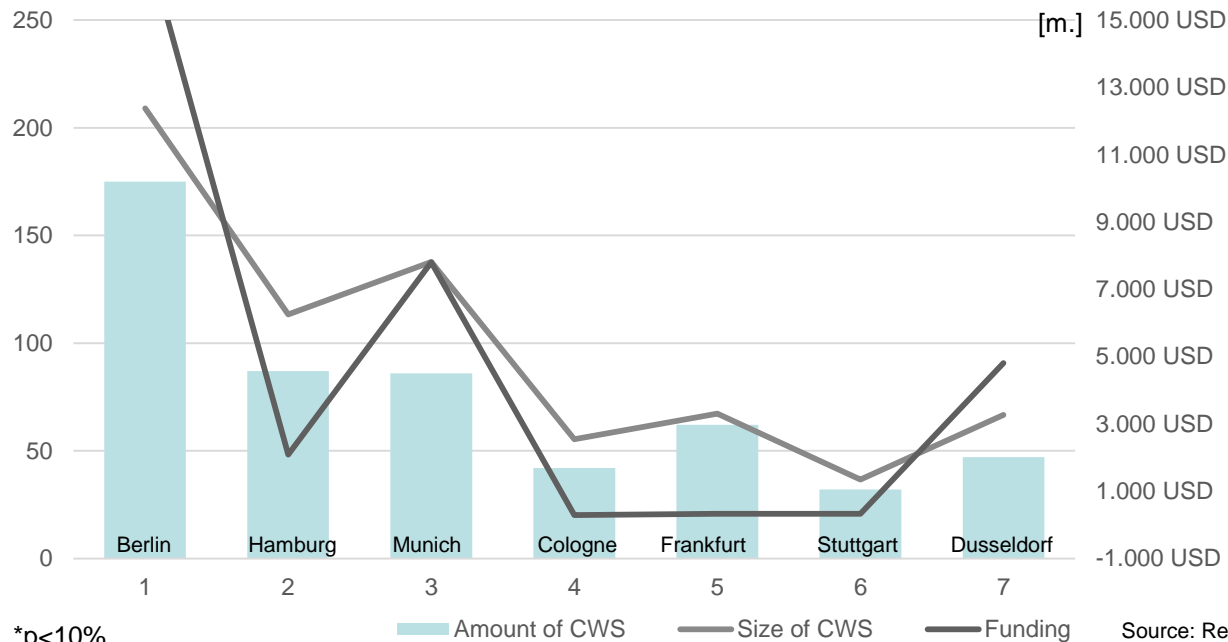
1. Number of Foundings of ventures in crunchbase database for **funding activities** in a region
2. The **supply of flexible office space**, measured as
 - number of operating coworking spaces and
 - size of coworking spaces as a proxy
3. The average space size of operating coworking spaces in a region for **the scalability of flexible office space** in a region
4. The raise of financing capital (seed, venture capital, debts and other) as a proxy for **funding** of ventures

Further assumptions:

- We use a conservative approach
- Type of funding reflexes the type of firm: **Start-ups** finance through **seed** and **VC**, more stable and **large firms** finance finance through **debts**
- Crunchbase data is also a **representative database** for financing ventures in the European market

Pearson Correlations between relevant variables

	Supply of CWS (number of CWS)	Supply of CWS (size of CWS)	Founding Activity	Funding (amount of funding)	Funding (number of funded firms)
Supply of CWS (number of CWS)	1				
Supply of CWS (size of CWS)	.742**	1			
Founding Activity	.806**	.538**	1		
Funding (amount of funding)	.666**	.610**	.608**	1	
Funding (number of funded firms)	.747**	.557**	.741**	.676**	1

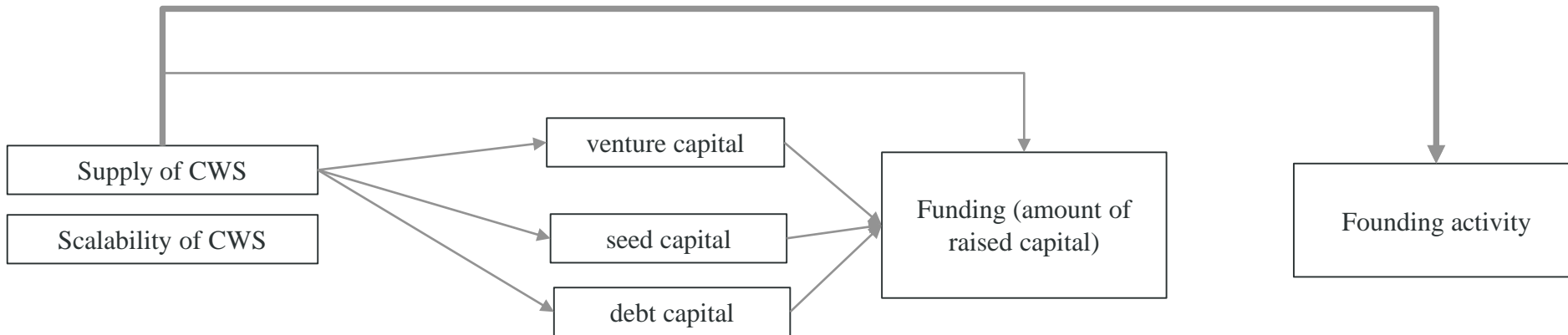


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Amount of CWS Size of CWS Funding

Source: Researcher data (crawler) & Crunchbase data

Research framework – proposed research model

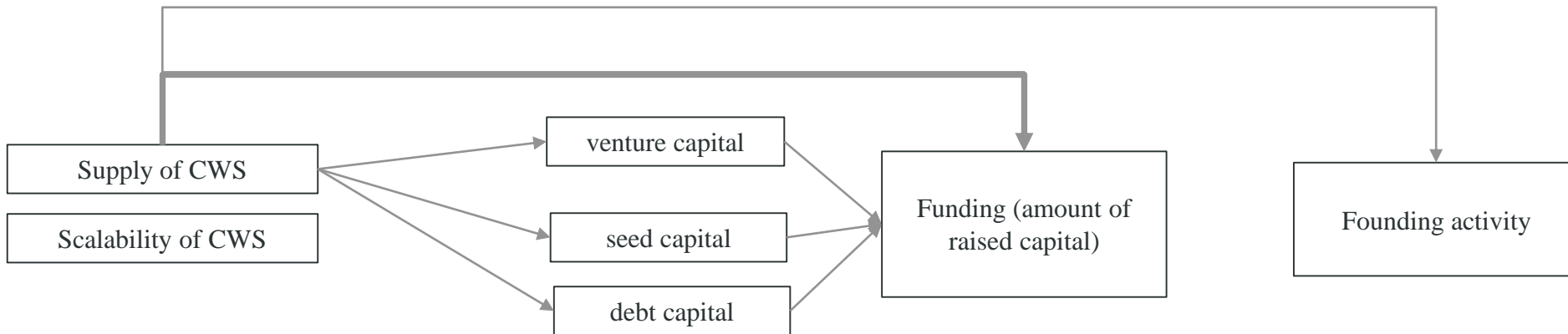


Coworking spaces support founding activity because entrepreneurs have better access to infrastructure and are able to concentrate more on their competitive advantage. (Spinuzzi 2012)

Entrepreneurs in coworking-spaces face cooperative tension. (Bouncken 2018)

Hypothesis 1: The relation between founding activity of ventures and the supply of coworking spaces is inverted U-shaped.

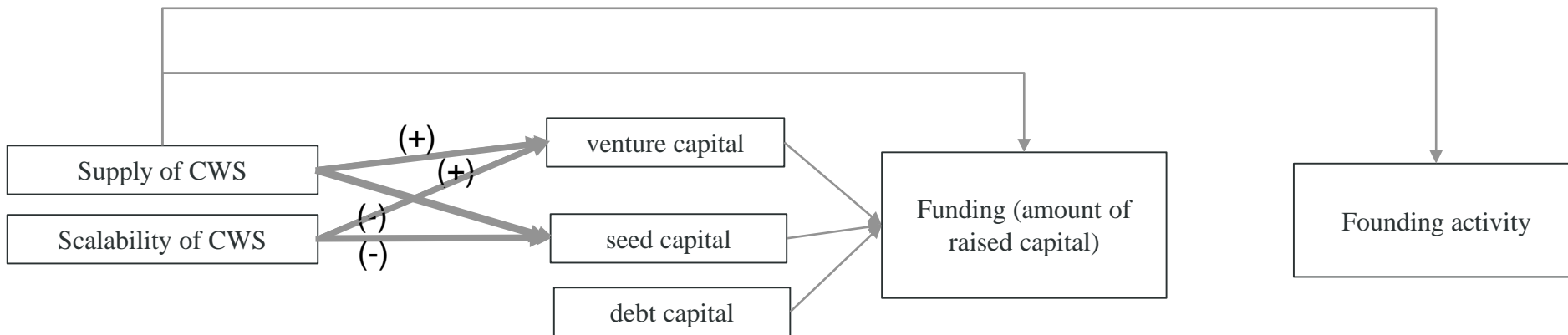
Research framework – proposed research model



- Coworking spaces help entrepreneurs concentrate on their competitive advantage; Coworking spaces add value by knowledge management
- Ventures attracts more financing because they concentrate on their core business. (Bouncken 2018; Oberholz 2018; Collier 2018)

Hypothesis 2: Amount of funding is positively related to the supply of coworking spaces (irrespective of type of funding)

Research framework – proposed research model



- *Start-ups (ventures with high uncertainty that mainly finance through equity-alike fundings: seed & VC) are positive related to flexible office space*
- *Stable firms and big corporates (mainly financing through debt-alike funding) tend to work in larger coworking spaces (e.g. WeWork).*

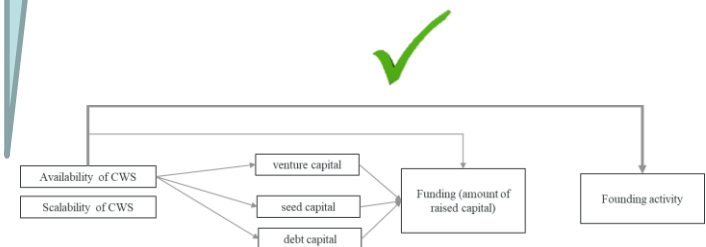
Hypothesis 3: *Seed and venture capital is positive related to the supply of coworking spaces*

Hypothesis 4: *Seed and venture capital is negative related to the scalability of coworking spaces.*

Results of Linear Fixed Effects Regressions Analysis – Hypothesis 1

Independent Variables	NumFoundingFirms	NumFoundingFirms
CWSNumberSince2010	3,437417***	
PrimeRentOfficeMarket	0,2289662	2,610626
OfficeSpaceTurnover	-0,0000612	-0,0000539
CWSNumberISince2010squared	-0,0221854***	
CWSSizeSince2010		0,0032965***
CWSSizeSince2010Squared		-1,66e-08***
NumFoundingFirms		
NonCWSAlIikeVentures		
CWSAvgSpaceSince2010		
Constant	34,97391	-27,35515
Region fixed Effects	Yes	Yes
Year fixed Effects	Yes	Yes
N	62	62
within R ²	0,7221	0,7811
between R ²	0,6069	0,0469
overall R ²	0,0141	0,0678

- Positive relation between supply of coworking spaces and founding activity.
- Regarding the squared term of the supply of CWS, we find an inverted U-shaped relationship
- Thus, there exists an optimum of coworking spaces in a market.

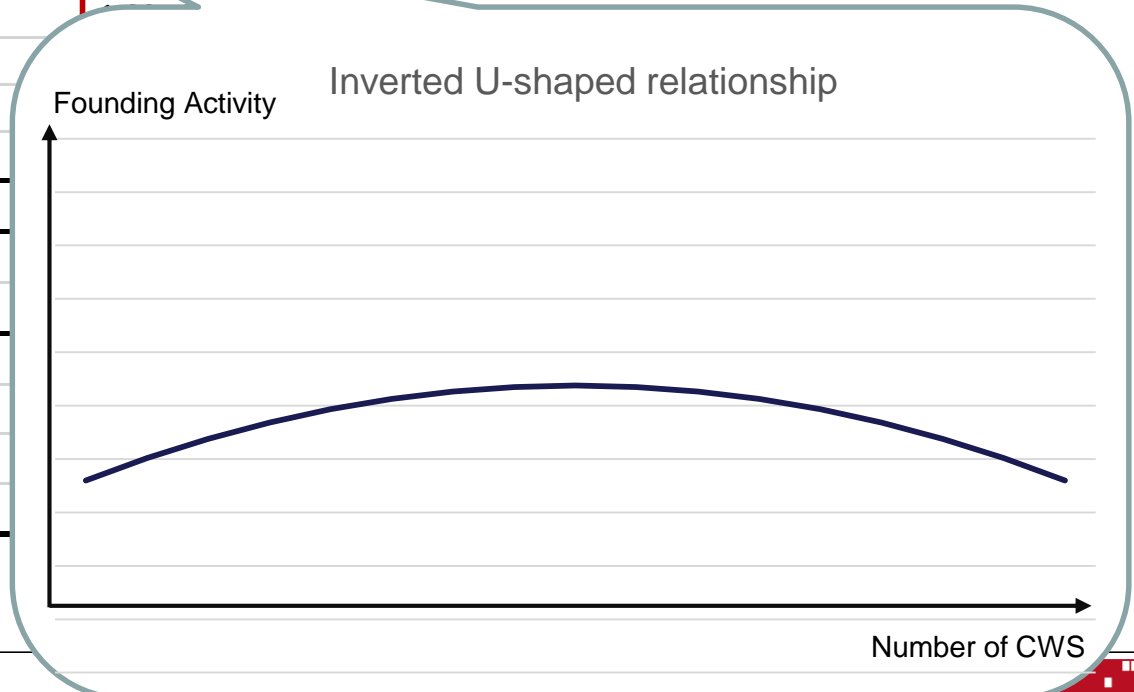


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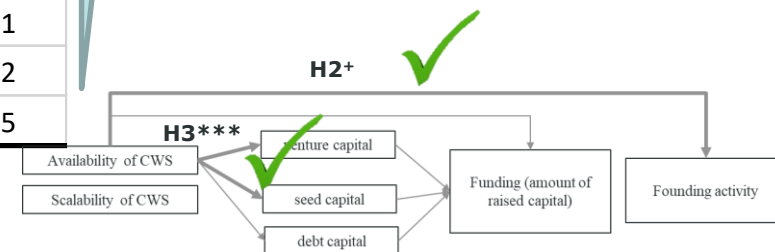


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Results of Linear Fixed Effects Regressions Analysis – Hypothesis 2 & 3

Independent Variables	Amount AllFunding	Amount VCPE	Amount Seed	Amount Debt
CWSNumberSince2010				
PrimeRentOfficeMarket	-2,24E+07	6,00e+07*	3111787**	3395349
OfficeSpaceTurnover	2577,38*	-183,5245	-15,42717	16,83996
CWSNumberISince2010squared				
CWSSizeSince2010	17391,58*	11265,96***	597,1193***	270,6628
CWSSizeSince2010Squared				
NumFoundingFirms	1023789	2242639**	-3672,839	28669,76
NonCWSAlikeVentures	8,11e+10***	5,67e+10***	1,73e+09***	-4,31E+09
CWSAvgSpaceSince2010				
Constant	-5,52E+08	-1,44E+09	-7,10E+07	-9,19E+07
Region fixed Effects	Yes	Yes	Yes	Yes
Year fixed Effects	Yes	Yes	Yes	Yes
N	61	62	62	61
within R ²	0,6517	0,8147	0,7834	0,2631
between R ²	0,8255	0,4078	0,146	0,0062
overall R ²	0,6804	0,5012	0,3156	0,0875

- Positive relation between the supply of coworking spaces and fundings.
- Venture capital and seed capital funding is significant positive.
- Especially start-ups (equity-alike financing) relate significantly with the supply of CWS.

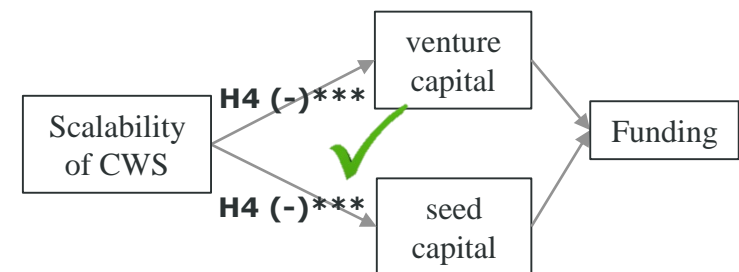


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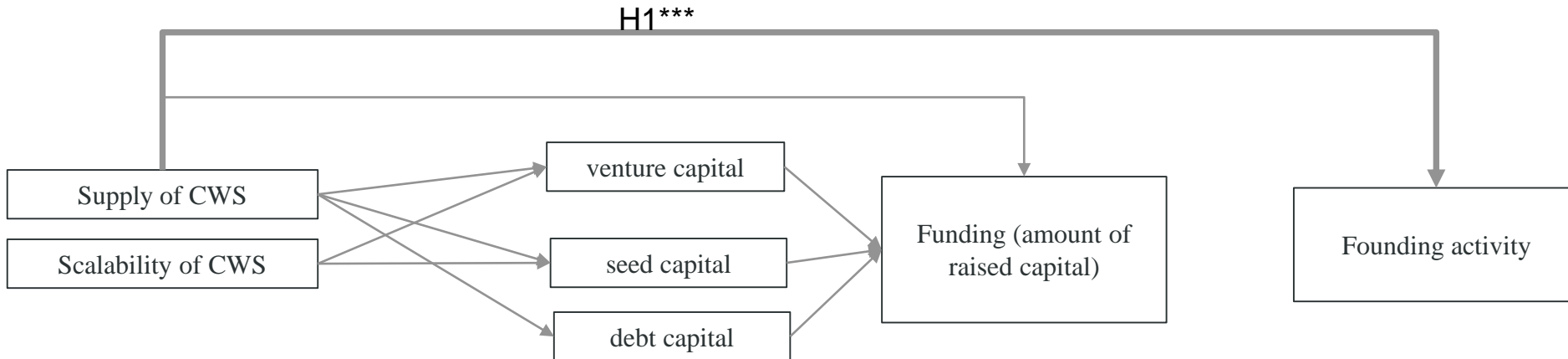
Results of Linear Fixed Effects Regressions Analysis – Hypothesis 4

Independent Variables	Amount ConvDebt	Amount VCP	Amount Seed
CWSNumberSince2010			
PrimeRentOfficeMarket	672690,7	3,49e+07*	
OfficeSpaceTurnover	4,30349	100,3553	
CWSNumberISince2010squared			
CWSSizeSince2010	-46,7609	2938,335	75,39134
CWSSizeSince2010Squared			
NumFoundingFirms	-4756,82	-1038323	-222504,1***
NonCWSAlizeVentures	-2,57E+07	3,97E+10***	6,25e+08*
CWSAvgSpaceSince2010	35,61513	-112412,7***	-8070,255***
Constant	-1,77E+07	5,44E+08	-261594,4
Region fixed Effects	Yes	Yes	Yes
Year fixed Effects	Yes	Yes	Yes
N	60	60	60
within R ²	0,2163	0,792	0,8889
between R ²	0,1724	0,0168	0,9082
overall R ²	0,0755	0,0323	0,111

- Negative relation between the scalability of coworking spaces and funding of VC and seed
- Large CWS (e.g. WeWork) are not as attractive for startups as smaller CWS.
→ **Crowding out effect**
- Large coworking spaces tend to concentrate on corporates and more stable firms (debt-alike financing).



Results Overview and conclusion

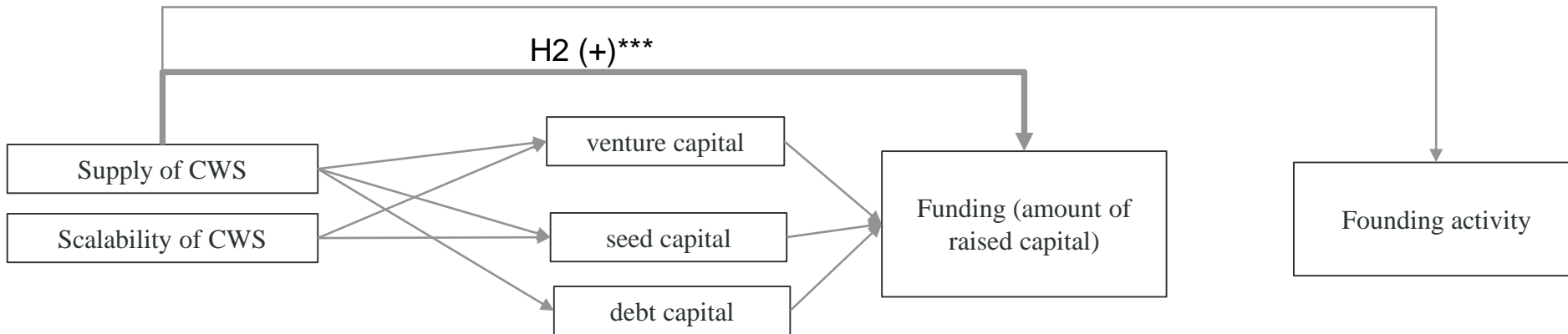


H1: CWS are inverted U-shaped related to founding activities of ventures

Conclusion

- Ventures and foundings are positive affected until a certain optimum. After this optimum (mature CWS-market) where big operators join the flexible office market (e.g. WeWork etc.) ventures do not make use of as much as in earlier CWS markets.

Results Overview and conclusion



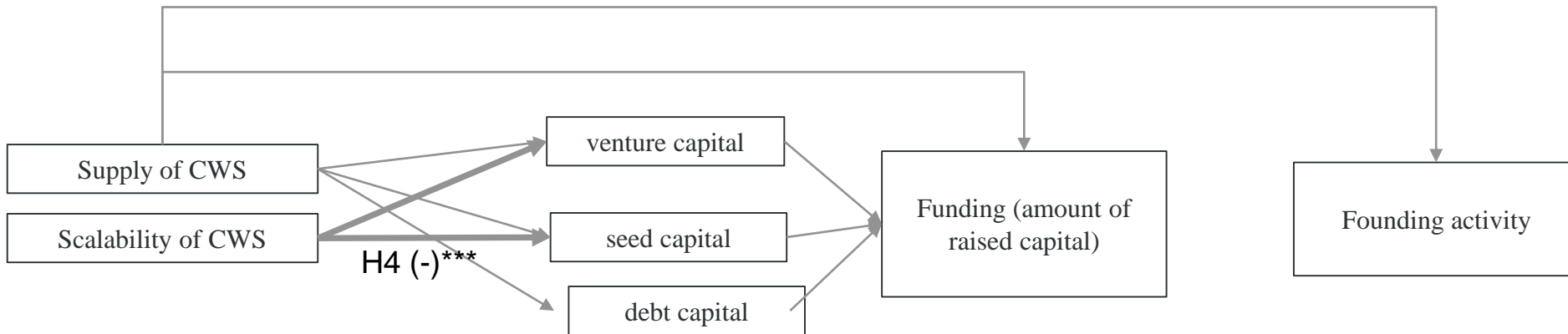
H2: CWS are positive related with fundings (financing of ventures)

H2: Equity-alike financing (start-up ventures) are positive related to CWS

Conclusion

- positive relation between the supply of coworking spaces and (equity-alike) fundings
- supports thesis that CWS offer an entrepreneurial environment and a productive business environment, where ventures can focus on their core business, which leads to higher success and therefore higher fundings.

Results Overview and conclusion



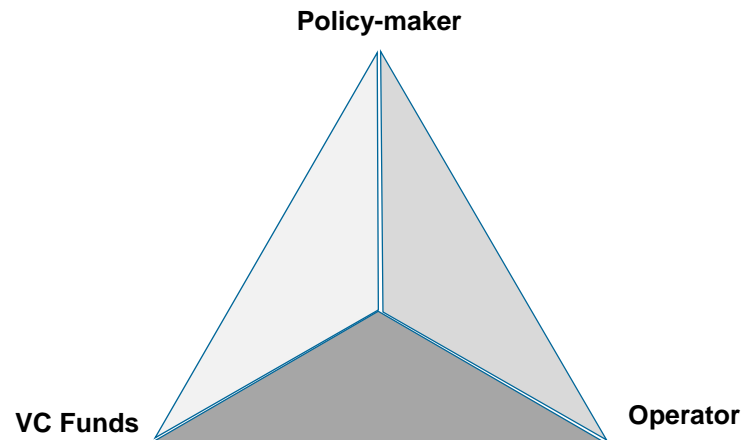
H3: Seed and vc financing are negative related to large CWS (scalability of CWS)

Conclusion

- Large coworking spaces (e.g. WeWork) tend to concentrate on big corporates, growing ventures are less to be found there.
- → crowding out effect

Practical implications

- The supply of coworking spaces are an important enabler of venture growth.
- Public policy-maker can support venture growth and founding activities of start-ups by supplying (small, affordable) coworking spaces.



Venture capitalists should focus on early-stage coworking markets, which seem to be an important environment for growing firms with a higher uncertainty business model.

As the market of coworking spaces grows and gets mature, larger coworking spaces enter the market (WeWork) and tend to crowd out start-up ventures and focus on large corporates and stable firms.

Thank you for your attention

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<http://real-estate-research.org/>

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