Internal versus external agglomeration advantages in investment location choice: the role of global cities' international connectivity

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Supplemental Material

Appendix

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The Role of International Connectivity of Global cities

Appendix

This appendix shows the results of supplementary analyses (section A) and additional descriptives (section B). The results of supplementary analyses are shown for the three full models: all investments, production-related investments (manufacturing and R&D) and service-related investments (HQ, logistics, sales and services

Table A1 shows the random parts of the coefficients estimated for the mixed logit models reported in Table 3 of the paper. In model 1 all control variable coefficients are treated as random, in the next models, only those control variables that have a significant random coefficient are treated as random. The agglomeration variables and their interaction in models 2-6 display significant heterogeneity in parameters, suggesting that it is important to allow general investor heterogeneity in preference. Table A2 shows results of conditional models, which nevertheless are comparable to the results of the mixed logit models reported in Table 3 of the paper.

Table A3 shows results when allowing for non-linearity in the effect of agglomeration by including the squared terms of the agglomeration variables and Table A4 reports results including cumulative counts instead of the 5-year window agglomeration variable produces comparable results. The focal results are unchanged in both these alternative models.

We also estimated separate models for each value chain activity (Table A5). The results show similar patterns across value chain investments with positive impacts of internal and external agglomeration and negative interaction between internal and external agglomeration. Interaction coefficients with international connectivity are significant for service-related activities but not for production-based activities, in line with Hypothesis 3. The lack of a significant effect of connectivity in interaction with agglomeration

for in particular the value chain activities with a small number of observations (e.g., Manufacturing, R&D) may be due to the lesser power of these models.

Table A6 show empirical results when using a more aggregate measure to capture external agglomeration. This broader industry measure is at the industry cluster level, as categorized by fDi markets database (e.g., ICT & Electronics, Professional Services and Life Sciences). Table A7 shows results when uses 39 NAICS industry sectors to measure external agglomeration. Both Tables A6 and A7 show results comparable with those reported in the paper. Table A8 shows results with country fixed effects includes. While the estimates for the hypotheses testing variables do not change appreciably, the coefficients on the continuous country variables are, as may be expected, strongly affected.

Tables B1-B4 show descriptive statistics. Table B1 shows the number of investments per value chain activity, Table B2 the distribution of investments over the cities. Table B3 the international connectivity indices of the 71 global cities in 2015, Table B4 the number of investments by industry and value chain group.

Table A1. Random parts of the coefficients estimated in the mixed logit models of Table 5

	Model 1	Model 2	Model 3	Model 4	Model 5	Production-related investments	Service-related investments
City-level variable							
Internal agglomeration		2.466	-2.512	2.386	2.382	3.750	-2.190
		(0.000)	(0.000)	(0.000)	(0.000)	(0.009)	(0.001)
External agglomeration		0.321	0.322	0.423	0.428	0.553	0.386
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Connectivity		-0.0115	0.0175	0.0129	-0.0446	0.212	0.0511
		(0.774)	(0.536)	(0.794)	(0.267)	(0.410)	(0.197)
Internal agglomeration * external agglomeration			-0.202		0.477	1.671	0.853
			(0.570)		(0.021)	(0.026)	(0.001)
Connectivity *internal agglomeration				-0.115	-0.0387	0.0395	0.673
				(0.701)	(0.870)	(0.875)	(0.100)
Connectivity *external agglomeration				0.155	0.175	-0.132	0.211
				(0.002)	(0.000)	(0.157)	(0.000)
Home country investment share	-0.0128						
	(0.530)						
GDP	0.397	0.102	0.0573	0.0393	0.0837	0.157	-0.128
	(0.000)	(0.189)	(0.340)	(0.609)	(0.197)	(0.093)	(0.001)
GDP growth	-2.601	0.0247	-0.307	0.596	-0.390	4.440	0.179
	(0.032)	(0.934)	(0.286)	(0.037)	(0.242)	(0.028)	(0.572)
Population density	0.462	0.0405	0.0817	0.101	0.00360	0.162	0.0428
	(0.000)	(0.482)	(0.227)	(0.076)	(0.951)	(0.484)	(0.503)
Population density squared	0.126	0.00850	-0.00938	0.0204	0.00664	0.0562	0.0112
	(0.000)	(0.624)	(0.507)	(0.208)	(0.636)	(0.358)	(0.285)
Wage level	0.0438						
	(0.423)						
Geographical distance	0.182	0.112	0.163	0.0805	0.0895	-0.128	-0.0823
	(0.001)	(0.382)	(0.003)	(0.512)	(0.397)	(0.576)	(0.318)
Patent intensity	0.652	0.522	0.413	0.421	-0.347	0.184	0.429
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.781)	(0.000)
Top universities	0.0173						
	(0.844)						
Net migration rate	0.0597						
	(0.879)						
Country-level variable							
Corporate tax rate	-0.0677						
	(0.101)						
Language distance	0.532						
	(0.136)						
Cultural distance	-0.233	0.0102	0.169	0.214	0.122	0.222	0.257
	(0.001)	(0.982)	(0.060)	(0.004)	(0.639)	(0.056)	(0.007)
Country GDP	-0.0221						
	(0.111)						
Country GDP growth	1.619						
	(0.678)						
Country population density	0.341	0.203	0.194	0.192	0.204	0.263	0.196
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observation	2590706	2590706	2590706	2590706	2590706	244009	2346697
Number of projects	38873	38873	38873	38873	38873	3699	35174
Number of firms	19208	19208	19208	19208	19208	2327	17947
Wald chi^2	11578.0	17636.8	17464.6	14663.0	15038.2	3546.5	12791.0
(*p*-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Note: *p* values in parentheses. Random parameters for control variables that are insignificant in model 1 are no longer treated as random in models 2-6.

Table A2. Results of conditional logit models

	Full Model	Production-related investments	Service-related investments
City-level variable			
Internal agglomeration	1.336	1.998	1.282
	(0.000)	(0.000)	(0.000)
External agglomeration	0.771	0.814	0.741
	(0.000)	(0.000)	(0.000)
Connectivity	0.134	0.0807	0.150
	(0.000)	(0.235)	(0.000)
Connectivity *internal agglomeration	-0.613	0.575	-0.995
	(0.003)	(0.076)	(0.000)
Connectivity *external agglomeration	-0.0964	0.000950	-0.103
	(0.000)	(0.982)	(0.000)
Internal agglomeration * external agglomeration	-0.727	-0.696	-0.743
	(0.000)	(0.000)	(0.000)
Home country investment share	0.743	0.259	0.769
	(0.000)	(0.120)	(0.000)
GDP	0.328	0.285	0.356
	(0.000)	(0.000)	(0.000)
GDP growth	1.149	1.835	0.922
	(0.000)	(0.039)	(0.003)
Population density	0.312	0.412	0.303
	(0.000)	(0.000)	(0.000)
Population density squared	-0.0867	-0.116	-0.0848
	(0.000)	(0.000)	(0.000)
Wage level	-0.0362	-0.271	-0.00932
	(0.015)	(0.000)	(0.552)
Geographical distance	-0.161	-0.120	-0.165
	(0.000)	(0.000)	(0.000)
Patent intensity	-0.0386	-0.00386	-0.0514
	(0.035)	(0.954)	(0.007)
Top universities	-0.0207	0.0973	-0.0399
	(0.159)	(0.035)	(0.010)
Net migration rate	2.642	4.607	2.525
	(0.000)	(0.000)	(0.000)
Country-level variable			
Corporate tax rate	-0.202	-0.281	-0.204
	(0.000)	(0.000)	(0.000)
Language distance	-1.036	-1.216	-1.017
	(0.000)	(0.000)	(0.000)
Cultural distance	-0.130	-0.0254	-0.141
	(0.000)	(0.395)	(0.000)
Country GDP	0.0392	0.0599	0.0310
	(0.000)	(0.005)	(0.000)
Country GDP growth	2.523	1.817	2.881
	(0.000)	(0.080)	(0.000)
Country population density	0.0411	-0.00488	0.0475
	(0.000)	(0.751)	(0.000)
Observation	2590706	244009	2346697
Number of projects	38873	3699	35174
Number of firms	19208	2327	17947
Country fixed effect	NO	NO	NO
Wald chi^2	20394.4	3524.3	18448.3
(*p*-value)	(0.000)	(0.000)	(0.000)

Note: *p* values in parentheses

Table A3. Results of models with squared terms of agglomeration factors

	Full model	Production-related investments	Service-related investments
City-level variable			
Internal agglomeration	2.074	3.820	1.676
	(0.000)	(0.000)	(0.000)
Internal agglomeration squared term	-1.135	-3.126	-0.570
	(0.000)	(0.000)	(0.018)
External agglomeration	0.762	0.894	0.723
	(0.000)	(0.000)	(0.000)
External agglomeration squared term	0.0125	-0.0333	0.0275
	(0.000)	(0.004)	(0.000)
International connectivity	0.131	0.0858	0.147
	(0.000)	(0.210)	(0.000)
Intl. connectivity * Internal agglomeration	-0.621	0.634	-0.998
	(0.002)	(0.075)	(0.000)
Intl. connectivity * External agglomeration	-0.123	0.00102	-0.167
	(0.000)	(0.981)	(0.000)
Internal agglomeration * External agglomeration	-0.767	-0.690	-0.766
	(0.000)	(0.000)	(0.000)
Home country investment share	0.791	0.154	0.859
	(0.000)	(0.383)	(0.000)
GDP	0.326	0.259	0.355
	(0.000)	(0.000)	(0.000)
GDP growth	1.166	2.194	0.995
	(0.000)	(0.014)	(0.001)
Population density	0.312	0.402	0.304
	(0.000)	(0.000)	(0.000)
Population density squared	-0.0870	-0.113	-0.0857
	(0.000)	(0.000)	(0.000)
Wage level	-0.0341	-0.261	-0.00546
	(0.021)	(0.000)	(0.727)
Geographical distance	-0.161	-0.118	-0.167
	(0.000)	(0.000)	(0.000)
Patent intensity	-0.0400	-0.00217	-0.0559
	(0.028)	(0.974)	(0.003)
Top universities	-0.0246	0.111	-0.0474
	(0.095)	(0.017)	(0.002)
Net migration rate	2.570	4.596	2.327
	(0.000)	(0.000)	(0.000)
Country-level variable			
Corporate tax rate	-0.204	-0.265	-0.213
	(0.000)	(0.000)	(0.000)
Language distance	-1.033	-1.218	-1.014
	(0.000)	(0.000)	(0.000)
Cultural distance	-0.128	-0.0230	-0.138
	(0.000)	(0.442)	(0.000)
Country GDP	0.0391	0.0653	0.0314
	(0.000)	(0.002)	(0.000)
Country GDP growth	2.476	1.465	2.715
	(0.000)	(0.157)	(0.000)
Country population density	0.0412	-0.00426	0.0479
	(0.000)	(0.781)	(0.000)
Observation	2590706	244009	2346697
Number of projects	38873	3699	35174
Number of firms	19208	2327	17947
Wald chi^2 (*p*-value)	20993.4 (0.000)	3665.5 (0.000)	18654.9 (0.000)

Note: *p* values in parentheses

Table A4. Results of models with internal agglomeration using cumulative prior investment counts instead of five fixed year window

	Full model	Production-related investments	Service-related investments
City-level variable			
Internal agglomeration	1.000	1.531	0.981
	(0.000)	(0.000)	(0.000)
External agglomeration	0.655	0.568	0.658
	(0.000)	(0.000)	(0.000)
International connectivity	0.0814	0.0538	0.0835
	(0.001)	(0.447)	(0.001)
Intl. connectivity * Internal agglomeration	-0.249	0.570	-0.569
	(0.168)	(0.034)	(0.003)
Intl. connectivity * External agglomeration	-0.0534	0.0403	-0.0630
	(0.000)	(0.299)	(0.000)
Internal agglomeration * External agglomeration	-0.642	-0.532	-0.662
	(0.000)	(0.000)	(0.000)
Home country investment share	7.530	8.124	7.455
	(0.000)	(0.000)	(0.000)
GDP	0.312	0.332	0.318
	(0.000)	(0.000)	(0.000)
GDP growth	0.824	1.684	0.668
	(0.006)	(0.080)	(0.036)
Population density	0.238	0.344	0.226
	(0.000)	(0.000)	(0.000)
Population density squared	-0.0723	-0.103	-0.0693
	(0.000)	(0.000)	(0.000)
Wage level	-0.00692	-0.260	0.0166
	(0.652)	(0.000)	(0.301)
Geographical distance	-0.135	-0.0908	-0.137
	(0.000)	(0.000)	(0.000)
Patent intensity	-0.0637	0.0368	-0.0760
	(0.001)	(0.612)	(0.000)
Top universities	-0.110	0.00750	-0.124
	(0.000)	(0.877)	(0.000)
Net migration rate	2.488	3.100	2.491
	(0.000)	(0.027)	(0.000)
Country-level variable			
Corporate tax rate	-0.150	-0.290	-0.142
	(0.000)	(0.000)	(0.000)
Language distance	-1.007	-1.134	-1.006
	(0.000)	(0.000)	(0.000)
Cultural distance	-0.0378	-0.0598	-0.0377
	(0.000)	(0.048)	(0.000)
Country GDP	0.00626	0.00459	0.00500
	(0.392)	(0.833)	(0.518)
Country GDP growth	2.643	1.991	2.858
	(0.000)	(0.079)	(0.000)
Country population density	0.0441	-0.0373	0.0523
	(0.000)	(0.017)	(0.000)
Observation	2590706	244009	2346697
Number of projects	38873	3699	35174
Number of firms	19208	2327	17947
Wald chi^2	19152.6	3603.5	17024.7
(*p*-value)	(0.000)	(0.000)	(0.000)

Note: *p* values in parentheses

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Table A5. Results of conditional logit models by value chain activity

	HQ	Logistics	Manufacturing	R&D	Sales	Services
City-level variable						
Internal agglomeration	2.360	2.534	4.207	1.598	0.915	1.603
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
External agglomeration	0.925	0.665	0.847	0.782	0.764	0.638
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
International connectivity	0.623	0.143	-0.00137	0.111	0.130	0.134
	(0.000)	(0.248)	(0.990)	(0.204)	(0.000)	(0.007)
Intl. connectivity * Internal agglomeration	-1.194	-1.037	-0.504	0.693	-1.321	-1.601
	(0.002)	(0.048)	(0.524)	(0.050)	(0.009)	(0.015)
Intl. connectivity * External agglomeration	-0.346	-0.174	0.0160	-0.0454	-0.0926	-0.0142
	(0.000)	(0.006)	(0.844)	(0.376)	(0.000)	(0.522)
Internal agglomeration * External agglomeration	-0.720	-0.966	-1.601	-0.496	-0.734	-0.615
	(0.000)	(0.001)	(0.000)	(0.002)	(0.000)	(0.000)
Home country investment share	-0.0841	0.0855	0.582	-0.0161	0.593	1.739
	(0.669)	(0.814)	(0.019)	(0.940)	(0.000)	(0.000)
GDP	0.319	0.509	0.296	0.283	0.334	0.365
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP growth	-1.090	-0.102	3.876	0.863	1.064	0.962
	(0.295)	(0.944)	(0.010)	(0.425)	(0.008)	(0.101)
Population density	0.0686	0.201	0.494	0.254	0.304	0.354
	(0.517)	(0.135)	(0.000)	(0.014)	(0.000)	(0.000)
Population density squared	-0.0458	-0.0897	-0.113	-0.100	-0.0828	-0.0943
	(0.115)	(0.010)	(0.002)	(0.001)	(0.000)	(0.000)
Wage level	0.280	-0.101	-0.307	-0.226	-0.0117	-0.0763
	(0.000)	(0.180)	(0.000)	(0.000)	(0.561)	(0.011)
Geographical distance	0.0329	-0.251	-0.173	-0.0786	-0.159	-0.211
	(0.219)	(0.000)	(0.000)	(0.011)	(0.000)	(0.000)
Patent intensity	-0.305	-0.573	-0.387	0.0778	0.0148	-0.0704
	(0.000)	(0.000)	(0.005)	(0.312)	(0.529)	(0.072)
Top universities	0.0123	-0.0919	0.0310	0.135	-0.0735	0.0316
	(0.831)	(0.188)	(0.693)	(0.018)	(0.000)	(0.297)
Net migration rate	2.668	0.513	6.599	1.829	3.372	2.187
	(0.073)	(0.785)	(0.000)	(0.322)	(0.000)	(0.004)
Country-level variable						
Corporate tax rate	-0.232	-0.360	-0.297	-0.248	-0.173	-0.213
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Language distance	-1.111	-1.071	-1.439	-1.167	-0.948	-1.071
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cultural distance	-0.135	-0.126	0.00663	-0.0259	-0.150	-0.122
	(0.000)	(0.005)	(0.899)	(0.480)	(0.000)	(0.000)
Country GDP	0.125	0.000687	0.0896	0.0521	0.0409	-0.000324
	(0.000)	(0.985)	(0.009)	(0.056)	(0.000)	(0.983)
Country GDP growth	6.037	4.449	0.0224	3.196	2.013	4.135
	(0.000)	(0.010)	(0.990)	(0.013)	(0.000)	(0.000)
Country population density	0.125	0.0880	-0.0646	0.0577	0.0428	0.0321
	(0.000)	(0.001)	(0.012)	(0.002)	(0.000)	(0.000)
Observation	183884	100329	99336	144673	1378361	684123
Number of projects	2791	1511	1480	2219	20618	10254
Number of firms	2407	829	1151	1380	11098	5584
Wald chi^2	3731.0	777.2	2204.3	1683.8	10220.4	6271.3
(*p*-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Note: *p* values in parentheses

Table A6. Results of models with a broader aggregation of industry agglomeration (18 industries)

	Full model	Production-related investments	Service-related investments
City-level variable			
Internal agglomeration	1.530	2.146	1.482
	(0.000)	(0.000)	(0.000)
External agglomeration	0.777	0.822	0.747
	(0.000)	(0.000)	(0.000)
International connectivity	0.141	0.0963	0.155
	(0.000)	(0.168)	(0.000)
Intl. connectivity * Internal agglomeration	-0.644	0.554	-1.011
	(0.002)	(0.074)	(0.000)
Intl. connectivity * External agglomeration	-0.106	-0.0532	-0.114
	(0.000)	(0.182)	(0.000)
Internal agglomeration * External agglomeration	-0.796	-0.726	-0.836
	(0.000)	(0.000)	(0.000)
Home country investment share	0.969	0.470	1.009
	(0.000)	(0.008)	(0.000)
GDP	0.318	0.268	0.349
	(0.000)	(0.000)	(0.000)
GDP growth	1.247	1.856	1.024
	(0.000)	(0.037)	(0.001)
Population density	0.312	0.386	0.304
	(0.000)	(0.000)	(0.000)
Population density squared	-0.0866	-0.107	-0.0855
	(0.000)	(0.000)	(0.000)
Wage level	-0.0202	-0.224	0.00284
	(0.178)	(0.000)	(0.858)
Geographical distance	-0.156	-0.107	-0.161
	(0.000)	(0.000)	(0.000)
Patent intensity	-0.0448	-0.0275	-0.0567
	(0.015)	(0.684)	(0.003)
Top universities	-0.0198	0.0742	-0.0370
	(0.176)	(0.104)	(0.017)
Net migration rate	2.336	2.959	2.336
	(0.000)	(0.026)	(0.000)
Country-level variable			
Corporate tax rate	-0.191	-0.266	-0.196
	(0.000)	(0.000)	(0.000)
Language distance	-1.048	-1.228	-1.032
	(0.000)	(0.000)	(0.000)
Cultural distance	-0.130	-0.0179	-0.141
	(0.000)	(0.557)	(0.000)
Country GDP	0.0360	0.0525	0.0283
	(0.000)	(0.014)	(0.000)
Country GDP growth	2.171	0.951	2.611
	(0.000)	(0.354)	(0.000)
Country population density	0.0393	-0.0102	0.0466
	(0.000)	(0.502)	(0.000)
Observation	2590706	244009	2346697
Number of projects	38873	3699	35174
Number of firms	19208	2327	17947
Wald chi^2	21093.7	3394.3	19223.0
(*p*-value)	(0.000)	(0.000)	(0.000)

Note: *p* values in parentheses

Table A7. Results of conditional logit models with investments classified in 39 NAICS industries

	Full model	Production-related investments	Service-related investments
City-level variable			
Internal agglomeration	1.553	2.296	1.454
	(0.000)	(0.000)	(0.000)
External agglomeration	0.751	0.753	0.724
	(0.000)	(0.000)	(0.000)
International connectivity	0.184	0.105	0.201
	(0.000)	(0.129)	(0.000)
Intl. connectivity * Internal agglomeration	-0.684	0.459	-1.011
	(0.001)	(0.136)	(0.000)
Intl. connectivity * External agglomeration	-0.107	-0.0309	-0.118
	(0.000)	(0.494)	(0.000)
Internal agglomeration * External agglomeration	-0.793	-0.758	-0.825
	(0.000)	(0.000)	(0.000)
Home country investment share	0.498	0.0576	0.584
	(0.000)	(0.788)	(0.000)
GDP	0.330	0.247	0.363
	(0.000)	(0.000)	(0.000)
GDP growth	1.347	2.277	1.089
	(0.000)	(0.009)	(0.000)
Population density	0.318	0.436	0.306
	(0.000)	(0.000)	(0.000)
Population density squared	-0.0889	-0.120	-0.0865
	(0.000)	(0.000)	(0.000)
Wage level	-0.0319	-0.235	-0.00860
	(0.031)	(0.000)	(0.582)
Geographical distance	-0.160	-0.117	-0.165
	(0.000)	(0.000)	(0.000)
Patent intensity	-0.0501	-0.0314	-0.0616
	(0.006)	(0.641)	(0.001)
Top universities	-0.00481	0.132	-0.0270
	(0.744)	(0.004)	(0.081)
Net migration rate	2.455	3.621	2.414
	(0.000)	(0.006)	(0.000)
Country-level variable			
Corporate tax rate	-0.207	-0.268	-0.210
	(0.000)	(0.000)	(0.000)
Language distance	-1.038	-1.279	-1.016
	(0.000)	(0.000)	(0.000)
Cultural distance	-0.139	-0.0205	-0.151
	(0.000)	(0.493)	(0.000)
Country GDP	0.0434	0.0692	0.0346
	(0.000)	(0.001)	(0.000)
Country GDP growth	2.311	1.012	2.793
	(0.000)	(0.321)	(0.000)
Country population density	0.0416	-0.00781	0.0491
	(0.000)	(0.608)	(0.000)
Observation	2590706	244009	2346697
Number of projects	38873	3699	35174
Number of firms	19208	2327	17947
Wald chi^2	21183.8	3518.3	18958.1
(*p*-value)	(0.000)	(0.000)	(0.000)

Notes : *p* values in parentheses

Table A8. Results of conditional logit models with country fixed effect

	Country GDP, GDP growth, Population density			GDP growth only		
	Full model (original share)	Production-related investments	Service-related investments	Full model (original share)	Production-related investments	Service-related investments
City-level variable						
Internal agglomeration	1.302	1.746	1.249	1.321	1.757	1.273
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
External agglomeration	0.707	0.652	0.666	0.713	0.656	0.674
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Connectivity	0.244	0.212	0.284	0.276	0.272	0.315
	(0.000)	(0.072)	(0.000)	(0.000)	(0.017)	(0.000)
Connectivity *internal agglomeration	-0.720	0.469	-1.085	-0.736	0.454	-1.103
	(0.001)	(0.154)	(0.000)	(0.001)	(0.168)	(0.000)
Connectivity *external agglomeration	-0.0844	-0.0573	-0.0924	-0.0891	-0.0620	-0.0983
	(0.000)	(0.208)	(0.000)	(0.000)	(0.176)	(0.000)
Int. agglomeration * ext. agglomeration	-0.686	-0.595	-0.708	-0.688	-0.593	-0.711
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Home country investment share	0.771	0.334	0.809	0.762	0.332	0.797
	(0.000)	(0.042)	(0.000)	(0.000)	(0.043)	(0.000)
GDP	0.210	-0.0300	0.266	0.189	-0.0639	0.243
	(0.000)	(0.681)	(0.000)	(0.000)	(0.365)	(0.000)
GDP growth	1.103	1.517	0.869	1.133	1.567	0.905
	(0.001)	(0.099)	(0.010)	(0.000)	(0.089)	(0.007)
Population density	0.468	0.966	0.372	0.531	0.972	0.449
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population density squared	-0.171	-0.407	-0.125	-0.189	-0.408	-0.149
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Wage level	-0.0363	0.137	-0.0568	-0.157	0.0419	-0.194
	(0.533)	(0.431)	(0.357)	(0.006)	(0.795)	(0.001)
Geographical distance	-0.258	-0.201	-0.264	-0.258	-0.201	-0.264
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Patent intensity	0.115	0.0335	0.130	0.102	0.0281	0.116
	(0.000)	(0.781)	(0.000)	(0.001)	(0.815)	(0.000)
Top universities	0.0537	0.132	0.0243	0.0414	0.105	0.0125
	(0.028)	(0.051)	(0.355)	(0.084)	(0.109)	(0.627)
Net migration rate	0.588	2.845	0.218	2.316	2.302	2.290
	(0.349)	(0.151)	(0.740)	(0.000)	(0.123)	(0.000)
Country-level variable						
Corporate tax rate	-0.353	-0.429	-0.376	-0.383	-0.330	-0.417
	(0.000)	(0.157)	(0.000)	(0.000)	(0.266)	(0.000)
Language distance	-0.788	-1.125	-0.755	-0.787	-1.124	-0.753
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cultural distance	-0.109	0.0136	-0.119	-0.109	0.0134	-0.119
	(0.000)	(0.711)	(0.000)	(0.000)	(0.716)	(0.000)
Country GDP	-0.553	-0.419	-0.626			
	(0.000)	(0.128)	(0.000)			
Country GDP growth	1.760	0.973	2.095	1.728	1.122	2.044
	(0.000)	(0.390)	(0.000)	(0.000)	(0.317)	(0.000)
Country population density	-0.709	0.644	-0.869			
	(0.005)	(0.408)	(0.001)			
Observation	2590706	244009	2346697	2590706	244009	2346697
Number of projects	38873	3699	35174	38873	3699	35174
Number of firms	19208	2327	17947	19208	2327	17947
Country fixed effect	YES	YES	YES	YES	YES	YES
Wald chi^2	21600.6	3635.3	19907.3	21528.9	3633.7	19807.1
(*p*-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Notes : *p* values in parentheses

Table B1. The distribution of investments across value chain activities

Value chain activity	Number of investments	Percentage
Production-related:	*3,699*	*9.51*
Manufacturing	1,480	3.80
R&D	2,219	5.71
Service-related:	*35,174*	*90.49*
Sales	20,618	53.04
Business Services	10,254	26.38
HQ	2,791	7.18
Logistics	1,511	3.89
Total	*38,873*	*100*

Table B2. The distribution of foreign investments over cities

Global city	Investment Freq.	Percent	Global city	Investment Freq.	Percent
LONDON	3028	7.79	WARSAW	371	0.95
SINGAPORE	2866	7.37	JAKARTA	333	0.86
DUBAI	2002	5.15	BOGOTA	317	0.82
SHANGHAI	1909	4.91	SHENZHEN	304	0.78
HONG KONG	1764	4.54	CHICAGO	303	0.78
NEW YORK	1336	3.44	STOCKHOLM	299	0.77
PARIS	1324	3.41	ZURICH	295	0.76
BEIJING	1077	2.77	VIENNA	291	0.75
SYDNEY	988	2.54	MIAMI	287	0.74
SAO PAULO	801	2.06	BRUSSELS	285	0.73
TOKYO	776	2.00	PRAGUE	275	0.71
BANGALORE	685	1.76	SANTIAGO	275	0.71
BERLIN	650	1.67	TAIPEI	268	0.69
MOSCOW	649	1.67	STPETERSBURG	264	0.68
MUNICH	625	1.61	RIO DE JANEIRO	263	0.68
MUMBAI	622	1.60	COPENHAGEN	260	0.67
MADRID	619	1.59	BOSTON	245	0.63
DUBLIN	603	1.55	BUDAPEST	239	0.61
FRANKFURT	579	1.49	BUENOS AIRES	238	0.61
BARCELONA	561	1.44	MONTREAL	230	0.59
MELBOURNE	557	1.43	ATLANTA	229	0.59
SAN FRANCISCO	539	1.39	RIYADH	227	0.58
DUSSELDORF	535	1.38	GENEVA	202	0.52
TORONTO	529	1.36	MANILA	185	0.48
AMSTERDAM	521	1.34	EDINBURGH	183	0.47
MEXICO CITY	489	1.26	CAIRO	177	0.46
BANGKOK	487	1.25	VANCOUVER	177	0.46
KUALA LUMPUR	479	1.23	ROME	153	0.39
SEOUL	478	1.23	DALLAS	144	0.37
ISTANBUL	472	1.21	LISBON	141	0.36
NEW DELHI	432	1.11	WASHINGTON	138	0.36
HOUSTON	391	1.01	TEL AVIV	113	0.29
MILAN	386	0.99	ATHENS	102	0.26
JOHANNESBURG	385	0.99	BEIRUT	87	0.22
HAMBURG	384	0.99	PHILADELPHIA	73	0.19
LOS ANGELES	372	0.96	Total	38,873	100

Note: see the text for details on the construction of the international connectivity index.

Table B3. International connectivity indices per city in 2015

Global city	Producer services connectivity		Knowledge connectivity		Airport connectivity		Overall	
	2015 Index	Rank	2015 Index	Rank	2015 Index	Rank	2015 Index	Rank
LONDON	100	1	42.55	15	100	1	80.85	1
NEW YORK	95.17	2	23.24	38	33.62	17	50.68	8
HONG KONG	75.87	3	28.09	30	72.31	4	58.75	3
SINGAPORE	72.69	4	44.23	13	58.86	6	58.59	4
PARIS	70.97	5	14.39	56	79.66	3	55.01	5
TOKYO	67.22	6	2.12	71	45.78	12	38.37	19
BEIJING	66.79	7	7.41	66	23.84	26	32.68	33
DUBAI	66.11	8	93.40	2	81.77	2	80.42	2
SHANGHAI	66.01	9	26.45	34	32.09	19	41.52	15
SYDNEY	61.91	10	27.42	31	14.48	38	34.60	28
MILAN	59.49	11	22.07	41	4.88	66	28.81	45
SAO PAULO	58.91	12	19.64	44	14.38	39	30.98	35
CHICAGO	58.52	13	13.08	61	12.44	44	28.02	49
MUMBAI	57.83	14	14.29	57	12.29	46	28.14	47
MOSCOW	56.74	15	18.98	46	40.17	13	38.63	17
FRANKFURT	56.48	16	22.02	42	57.25	7	45.25	12
MEXICO CITY	56.40	17	22.18	39	13.47	40	30.68	37
TORONTO	54.36	18	47.67	12	14.81	36	38.94	16
MADRID	53.90	19	25.00	36	35.23	16	38.05	22
SEOUL	52.26	20	3.70	70	55.69	9	37.22	23
JOHANNESBURG	51.96	21	30.90	27	9.24	58	30.70	36
KUALA LUMPUR	51.88	22	44.18	14	37.01	14	44.35	13
AMSTERDAM	51.65	23	30.21	28	61.54	5	47.80	9
LOS ANGELES	51.38	24	17.08	49	22.36	28	30.27	38
WARSAW	51.36	25	7.36	67	3.43	69	20.71	64
ISTANBUL	50.98	26	9.63	64	54.46	10	38.36	20
BRUSSELS	50.45	27	61.68	6	24.98	25	45.70	11
JAKARTA	50.05	28	91.07	3	13.15	42	51.42	7
MELBOURNE	47.63	29	24.10	37	9.35	56	27.03	53
WASHINGTON	47.60	30	15.38	54	9.29	57	24.09	57
ZURICH	47.08	31	40.06	19	27.13	22	38.09	21
DUBLIN	46.85	32	51.92	8	26.26	24	41.68	14
VIENNA	46.64	33	29.86	29	23.65	27	33.38	30
BUENOS AIRES	46.61	34	49.92	10	11.02	50	35.85	26
NEW DELHI	46.35	35	25.22	35	14.66	37	28.75	46
BANGKOK	45.35	36	62.25	5	56.37	8	54.66	6
SAN FRANCISCO	45.23	37	13.97	58	12.29	47	23.83	58
TAIPEI	44.96	38	16.49	51	46.81	11	36.09	25
STOCKHOLM	44.31	39	20.12	43	19.40	30	27.94	51
MIAMI	44.28	40	11.12	62	28.32	21	27.91	52
BARCELONA	42.73	41	32.27	26	30.40	20	35.13	27
SANTIAGO	42.15	42	8.08	65	8.63	59	19.62	68
BOSTON	41.61	43	15.37	55	5.84	65	20.94	63
MANILA	41.57	44	18.52	48	18.13	33	26.07	54
LISBON	41.09	45	39.05	20	18.50	32	32.88	32
PRAGUE	40.97	46	41.19	18	12.65	43	31.60	34

Table B3. International connectivity indices per city in 2015 (continued)

Global city	Producer services connectivity 2015 Index	Rank	Knowledge connectivity 2015 Index	Rank	Airport connectivity 2015 Index	Rank	Overall 2015 Index	Rank
TEL AVIV	40.28	47	27.15	33	16.55	34	27.99	50
MUNICH	40.21	48	16.61	50	33.25	18	30.03	39
ATLANTA	39.80	49	9.65	63	11.86	48	20.43	65
DUSSELDORF	39.72	50	18.96	47	19.09	31	25.92	55
BOGOTA	39.64	51	37.98	22	9.68	55	29.10	44
COPENHAGEN	39.47	52	22.08	40	26.40	23	29.32	43
ATHENS	38.64	53	38.93	21	12.30	45	29.96	41
ROME	38.45	54	34.95	24	35.32	15	36.24	24
HAMBURG	38.40	55	13.45	60	11.01	51	20.95	61
BANGALORE	38.32	56	47.72	11	3.45	68	29.83	42
RIYADH	38.28	57	53.02	7	10.95	52	34.08	29
BUDAPEST	37.28	58	41.96	16	10.80	53	30.01	40
DALLAS	37.01	59	15.47	53	8.13	60	20.20	67
CAIRO	36.69	60	65.32	4	13.34	41	38.45	18
HOUSTON	35.61	61	15.88	52	11.36	49	20.95	62
MONTREAL	34.95	62	34.19	25	6.26	62	25.13	56
PHILADELPHIA	34.28	63	19.42	45	0.43	71	18.04	69
BERLIN	33.79	64	13.52	59	22.24	29	23.18	59
BEIRUT	32.18	65	100	1	7.61	61	46.60	10
GENEVA	31.94	66	51.81	9	15.97	35	33.24	31
VANCOUVER	31.91	67	41.90	17	10.53	54	28.11	48
SHENZHEN	29.52	68	6.48	69	0.96	70	12.32	70
RIO DE JANEIRO	28.94	69	27.40	32	4.33	67	20.22	66
EDINBURGH	24.53	70	35.25	23	6.25	63	22.01	60
ST PETERSBURG	22.39	71	7.04	68	5.94	64	11.79	71
Overall	47.92		29.87		24.25		34.02	

Table B4. Number of investments by industry and value chain group

Industry	Total	Production	%Production	Service	%Service
Software & IT services	8624	753	8.73	7871	91.27
Chemicals	808	368	45.54	440	54.46
Industrial Machinery, Equipment & Tools	1667	318	19.08	1349	80.92
Communications	2120	296	13.96	1824	86.04
Pharmaceuticals	566	203	35.87	363	64.13
Food & Tobacco	885	188	21.24	697	78.76
Electronic Components	965	181	18.76	784	81.24
Automotive Components	333	163	48.95	170	51.05
Plastics	302	134	44.37	168	55.63
Metals	461	130	28.20	331	71.80
Business Services	6541	112	1.71	6429	98.29
Semiconductors	273	101	37.00	172	63.00
Automotive OEM	322	83	25.78	239	74.22
Consumer Products	1861	83	4.46	1778	95.54
Medical Devices	321	79	24.61	242	75.39
Biotechnology	198	78	39.39	120	60.61
Paper, Printing & Packaging	136	53	38.97	83	61.03
Business Machines & Equipment	378	48	12.70	330	87.30
Aerospace	302	38	12.58	264	87.42
Consumer Electronics	355	33	9.30	322	90.70
Coal, Oil and Natural Gas	393	32	8.14	361	91.86
Textiles	3300	29	0.88	3271	99.12
Rubber	100	24	24.00	76	76.00
Building & Construction Materials	70	22	31.43	48	68.57
Financial Services	3860	21	0.54	3839	99.46
Non-Automotive Transport OEM	158	21	13.29	137	86.71
Ceramics & Glass	84	20	23.81	64	76.19
Beverages	66	19	28.79	47	71.21
Engines & Turbines	90	15	16.67	75	83.33
Space & Defence	54	12	22.22	42	77.78
Alternative/Renewable energy	86	9	10.47	77	89.53
Minerals	63	8	12.70	55	87.30
Healthcare	94	7	7.45	87	92.55
Transportation	1566	5	0.32	1561	99.68
Renewable energy	95	4	4.21	91	95.79
Wood Products	36	4	11.11	32	88.89
Real Estate	706	3	0.42	703	99.58
Hotels & Tourism	432	1	0.23	431	99.77
Warehousing & Storage	82	1	1.22	81	98.78
Leisure & Entertainment	120	0	0.00	120	100.00
Total	38873	3699	9.52	35174	90.48