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## Appendix

## A. Appendix for chapter 3

Table 22: Summary statistics of application usage (by time on platform)

At week	N	Mean	SD	P5	P25	Median	P75	P95	Min	Max
<i>Installations per application at week</i>										
2	2663	20313	156030	115	423	1048	4201	60350	6	5645121
4	2648	45854	232974	298	1017	2668	12143	178808	9	6745367
8	2543	79982	331887	606	1813	4986	21600	359400	25	6422660
12	2370	114914	707842	789	2300	6462	27807	409020	75	20915474
16	1976	124103	564717	845	2557	6896	29217	511171	100	12987166
20	1450	136151	544403	880	2600	7036	31950	640439	100	6163167
<i>Daily active users per application at week</i>										
2	2667	3113	15369	19	82	201	776	11534	0	307482
4	2667	3826	16546	16	66	190	955	15977	0	260082
8	2668	3829	20200	8	52	163	700	12838	0	375255
12	2667	3636	22676	5	39	124	573	10368	0	528185
16	2467	3550	25540	4	26	99	460	8941	0	672454
20	2003	3783	30084	2	19	86	385	7988	0	739580
<i>Percent active users per application at</i>										
2	2667	22.81	12.97	4.75	13.00	21.14	30.71	46.83	0	94.00
4	2667	9.31	7.14	1.57	4.17	7.60	12.33	23.43	0	57.80
8	2668	4.68	5.05	0.17	1.50	3.00	5.83	14.75	0	42.17
12	2667	3.02	3.97	0.00	1.00	1.83	3.67	10.57	0	40.86
16	2467	2.25	3.32	0.00	0.50	1.00	2.67	8.33	0	38.25
20	2003	1.81	2.97	0.00	0.00	1.00	2.00	7.43	0	33.25

Table 23: Summary statistics of developer success (by time on platform)

<b>At week</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>P5</b>	<b>P25</b>	<b>Median</b>	<b>P75</b>	<b>P95</b>	<b>Min</b>	<b>Max</b>
<i>Installations per developer at week</i>										
2	2060	28543	228808	75	392	926	3403	56812	0	6156516
4	2142	54733	415401	153	880	2239	8700	143918	0	8851400
8	2263	74651	376078	0	1318	4029	16000	310400	0	9650524
12	2371	107777	554106	0	1323	4700	21124	474854	0	12810240
16	2228	119477	587441	0	1088	4200	23038	502925	0	14933310
20	1907	134172	596570	0	844	4277	24100	588700	0	6684922
<i>Daily active users per developer at week</i>										
2	2060	2742	17224	16	72	159	533	7930	0	307482
4	2142	3740	20504	13	60	166	690	13082	0	348932
8	2263	4405	22365	6	49	154	713	17711	0	336477
12	2371	5044	28898	5	38	124	683	15863	0	389933
16	2228	5318	31412	4	29	111	632	16495	0	598517
20	1907	5983	35669	3	25	113	652	17038	0	661303
<i>Percent active users per developer at</i>										
2	2060	21.77	15.11	2.00	10.07	19.41	31.00	48.63	0.00	100.00
4	2142	10.25	9.39	1.00	3.83	7.71	13.71	27.00	0.00	83.00
8	2263	6.15	8.03	0.00	1.60	3.50	7.21	21.00	0.00	76.00
12	2371	4.29	6.98	0.00	1.00	2.00	4.83	16.00	0.00	86.00
16	2228	3.56	6.75	0.00	0.75	1.50	3.67	14.33	0.00	100.00
20	1907	3.05	5.42	0.00	0.50	1.17	3.14	12.57	0.00	60.60

Table 24: Summary statistics portfolio vs. single-app developers.

Variable	PD	N	Mean	SD	Diff <sup>ab</sup>	P5	P25	Median	P75	P95	Min	Max
<i>company' (0/1)</i>	0	2207	0.38		***						0	1
	1	452	0.25								0	1
<i>entry week</i>	0	2207	2007w47	10	***	2007w27	2007w41	2007w47	2008w4	2008w11	2007w27	2008w15
	1	452	2007w42	9	***	2007w27	2007w35	2007w42	2007w48	2008w6	2007w27	2008w12
<i>entry before Sep 07 (0/1)</i>	0	2207	0.11		***						0	1
	1	452	0.23								0	1
<i>installations before Sep 07 (in 000s)</i>	0	2207	34.272	673.307	***	0.000	0.000	0.000	0.000	0.823	0.000	22248.230
	1	452	122.095	627.377	***	0.000	0.000	0.000	0.000	355.833	0.000	6487.595
<i>number of apps (before Sep 07)</i>	0	2207	0.15	1.23	***	0.00	0.00	0.00	0.00	1.00	0.00	50.00
	1	452	0.60	1.91	***	0.00	0.00	0.00	0.00	4.00	0.00	23.00
<i>maximum daily active usage of all apps by developer (in 000s)</i>	0	2207	7184	39967	***	104	163	384	1408	21823	1	661303
	1	452	29279	77004	***	263	915	3676	20339	130255	125	824494
<i>total accum. daily active usage of all apps per dev (in 000)</i>	0	2207	96.202	645.069	***	0.451	1.282	3.265	11.892	249.957	0.135	11908.671
	1	452	346.544	1002.826	***	2.417	10.928	41.698	238.970	1471.086	0.502	11616.982

Note: PD denotes whether a developer is a portfolio developer or not. The test on inequality is based on <sup>a</sup>independent samples t-tests and <sup>b</sup>Chi-square tests. \*\*\* denotes significance at the 1% level.

Table 25: Correlation matrix for variables of elapsed time analysis

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) <i>first 4 weeks accum. usage (in 100k)</i>	1														
(2) <i>growth rate (in percent)</i>	0.02	1													
(3) <i>number of updates in previous 2 weeks</i>	0.03	0.19	1												
(4) <i>number of updates in previous weeks 2 to 4</i>	-0.04	-0.09	-0.43	1											
(5) <i>company developer (0/1)</i>	0	-0.02	0.1	-0.05	1										
(6) <i>experience at application launch (in weeks)</i>	0.06	-0.05	-0.12	-0.05	0.04	1									
(7) <i>entry before Sept 02, 2007 (0/1)</i>	0.1	-0.04	0.05	0.02	0.12	0.66	1								
(8) <i>num. installs in week 34, 2007 (in million)</i>	0.22	-0.03	-0.02	-0.03	-0.01	0.17	0.23	1							
(9) <i>num. applications in week 34, 2007</i>	0.07	-0.03	0.01	0.04	0.1	0.41	0.62	0.23	1						
(10) <i>application in same category as previous</i>	0.06	-0.03	0.08	0.03	0.01	0.13	0.05	0.02	0.03	1					
(11) <i>entry order</i>	0.09	-0.02	0.13	0.08	0.13	0.51	0.24	0.01	0.19	0.25	1				
(12) <i>entry order (full sample)</i>	-0.01	-0.01	0.16	-0.03	0.13	0.3	0.25	0.05	0.26	0.1	0.57	1			
(13) <i>number of applications in launch week (in '00s)</i>	-0.03	0	-0.14	-0.12	-0.05	0.35	-0.23	-0.1	-0.18	0.11	0.33	0.07	1		
(14) <i>HHI in app launch week</i>	-0.02	0.01	0.17	0.1	0.04	-0.17	0.26	0.09	0.23	-0.12	-0.25	-0.04	-0.73	1	
(15) <i>HHI in application launch week</i>	-0.04	0.01	-0.13	-0.1	-0.04	0.37	-0.2	-0.09	-0.15	0.1	0.33	0.08	0.98	-0.63	1

Note: N=906 apps. Previous application characteristics: (1)-(4); Developer characteristics: (5)-(9); Application characteristics: (10)-(12); Market characteristics: (13)-(15).



## B. Appendix for chapter 4

Table 26: Adoption model: summary statistics for regressors

	<b>Mean</b>	<b>S.D.</b>	<b>Min</b>	<b>Max</b>
<i>Passive: awareness of friends' use (0/1)</i>	0.89		0.00	1.00
<i>Active: invitation received (0/1)</i>	0.70		0.00	1.00
<i>Benefit from local network effects (0/1)</i>	0.39		0.00	1.00
<i>Benefit from global network effects (0/1)</i>	0.25		0.00	1.00
<i>Passive: installations (in Millions)</i>	8.83	5.54	0.08	23.70
<i>Early adopter</i>	2.63	1.32	1.00	5.00
<i>Ease of use</i>	4.13	0.84	1.00	5.00
<i>Privacy concern</i>	2.60	1.43	1.00	5.00
<i>Cost of profile overload</i>	3.32	1.47	1.00	5.00
<i>Cost of time</i>	2.46	1.29	1.00	5.00
<i>Male (0/1)</i>	0.44		0.00	1.00
<i>Respondent age</i>	22.82	4.12	14.00	46.00
<i>Squared: respondent age</i>	537.83	213.62	196.00	2116.00
<i>USA (0/1)</i>	0.32		0.00	1.00
<i>Germany (0/1)</i>	0.34		0.00	1.00

Note: N = 356.

Table 27: Active influence model: summary statistics for regressors

	<b>Mean</b>	<b>S.D.</b>	<b>Min</b>	<b>Max</b>
<i>Benefit from local network effects (0/1)</i>	0.46	0.50	0.00	1.00
<i>Benefit from global network effects (0/1)</i>	0.27	0.45	0.00	1.00
<i>Active: invitation received (0/1)</i>	0.80	0.40	0.00	1.00
<i>Opinion leadership</i>	2.88	0.91	1.00	5.00
<i>Familiarity high (0/1)</i>	0.36	0.48	0.00	1.00
<i>Male (0/1)</i>	0.36	0.48	0.00	1.00
<i>Respondent age</i>	22.77	4.14	14.00	40.00
<i>Squared: respondent age</i>	535.69	202.77	196.00	1600.00
<i>USA (0/1)</i>	0.31	0.46	0.00	1.00
<i>Germany (0/1)</i>	0.35	0.48	0.00	1.00

Note: N = 168.

Table 28: Correlation matrix for variables of adoption model

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) <i>Passive: awareness of friends' use (0/1)</i>	1.00														
(2) <i>Active: invitation received (0/1)</i>	0.23	1.00													
(3) <i>Benefit from local network effects (0/1)</i>	-0.10	0.01	1.00												
(4) <i>Benefit from global network effects (0/1)</i>	-0.08	-0.08	0.54	1.00											
(5) <i>Passive: installations (in Millions)</i>	0.11	0.24	0.07	-0.01	1.00										
(6) <i>Early adopter</i>	-0.08	-0.07	0.01	0.12	-0.01	1.00									
(7) <i>Ease of use</i>	0.08	0.09	0.08	-0.07	-0.00	-0.01	1.00								
(8) <i>Privacy concern</i>	-0.21	-0.15	0.02	0.01	-0.06	0.09	-0.09	1.00							
(9) <i>Cost of profile overload</i>	-0.11	-0.11	0.01	-0.06	0.01	0.05	0.04	0.39	1.00						
(10) <i>Cost of time</i>	-0.14	-0.07	0.04	0.02	-0.01	0.11	-0.08	0.33	0.31	1.00					
(11) <i>Male (0/1)</i>	-0.18	-0.07	-0.02	0.00	0.08	0.32	-0.04	0.09	0.07	0.14	1.00				
(12) <i>Respondent age</i>	-0.14	-0.05	-0.04	-0.00	0.01	0.21	-0.07	0.07	-0.10	0.06	0.28	1.00			
(13) <i>Squared: respondent age</i>	-0.13	-0.05	-0.02	0.00	0.01	0.20	-0.06	0.06	-0.10	0.04	0.27	0.99	1.00		
(14) <i>USA (0/1)</i>	0.11	-0.01	0.07	-0.08	-0.02	-0.24	0.21	-0.03	0.18	-0.06	-0.29	-0.21	-0.18	1.00	
(15) <i>Germany (0/1)</i>	-0.10	-0.03	-0.06	-0.00	0.02	0.26	-0.14	0.02	-0.11	0.02	0.27	0.18	0.16	-0.49	1.00

Note: N=365.

## C. Appendix for chapter 5

Table 29: Application categories for sample for information spillover analysis

<b>Category</b>	<b>Frequency</b>	<b>Percent</b>	<b>Cum.</b>
<i>Just for Fun</i>	308	28.33	28.33
<i>Missing</i>	211	19.41	47.75
<i>Gaming</i>	125	11.50	59.25
<i>Dating</i>	73	6.72	65.96
<i>Messaging</i>	59	5.43	71.39
<i>Utility</i>	42	3.86	75.25
<i>Education</i>	34	3.13	78.38
<i>Sports</i>	32	2.94	81.32
<i>Alerts</i>	27	2.48	83.81
<i>Photo</i>	25	2.30	86.11
<i>Fashion</i>	25	2.30	88.41
<i>Chat</i>	24	2.21	90.62
<i>Food and Drink</i>	20	1.84	92.46
<i>Travel</i>	15	1.38	93.84
<i>Music</i>	14	1.29	95.12
<i>Events</i>	12	1.10	96.23
<i>Video</i>	10	0.92	97.15
<i>Politics</i>	9	0.83	97.98
<i>Business</i>	9	0.83	98.80
<i>Money</i>	6	0.55	99.36
<i>File Sharing</i>	5	0.46	99.82
<i>Mobile</i>	2	0.18	100.00
<b>Total</b>	<b>1,087</b>	<b>100.00</b>	

Table 30: Results of a reduced Cox Model (coefficients)

VARIABLES	(1)	(2)	(3)	(4)
	<i>elapsed time</i> between 1 and 2	<i>elapsed time</i> between 2 and 3	<i>elapsed time</i> between 3 and 4	<i>elapsed time</i> overall
<i>first 4 weeks accum. usage of prev. app (in 100k)</i>	0.0269 (0.0439)	-0.386 (0.244)	0.0658 (0.124)	-0.0478* (0.0254)
<i>growth rate prev. app (in percent)</i>	0.000131*** (2.47e-05)	0.000597*** (8.31e-05)	0.00159*** (0.000268)	0.000154*** (2.01e-05)
<i>weeks since platform launch</i>	-0.0657*** (0.00747)	-0.0712*** (0.0111)	-0.0519*** (0.0143)	-0.0612*** (0.00484)
Observations	452	183	99	906
Chi2	458.4	221.3	164.3	528.4
Log likelihood	-2313	-775.1	-367.2	-5295

Note: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; category dummies included but not displayed. (4) includes but does not display entry order dummies.

Table 31: Results of a reduced Cox Model (marginal effects)

VARIABLES	(1)	(2)	(3)	(4)
	<i>elapsed time</i> between 1 and 2	<i>elapsed time</i> between 2 and 3	<i>elapsed time</i> between 3 and 4	<i>elapsed time</i> overall
<i>first 4 weeks accum. usage of prev. app (in 100k)</i>	1.027 (0.0451)	0.680 (0.166)	1.068 (0.133)	0.953* (0.0242)
<i>growth rate prev. app (in percent)</i>	1.000*** (2.47e-05)	1.001*** (8.32e-05)	1.002*** (0.000268)	1.000*** (2.01e-05)
<i>weeks since platform launch</i>	0.936*** (0.00699)	0.931*** (0.0103)	0.949*** (0.0135)	0.941*** (0.00455)
Observations	452	183	99	906
Chi2	458.4	221.3	164.3	528.4
Log likelihood	-2313	-775.1	-367.2	-5295

Note: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; category dummies included but not displayed. (4) includes but does not display entry order dummies.

Table 32: Fixed-effects panel regression results for backward spillovers

<b>Fixed-effects panel regression of backwards spillovers</b>			
	(1)	(2)	(3)
VARIABLES	<i>spillover from 1 application 2 on (log of daily users)</i>	<i>spillover from application 3 on 1 (log of daily users)</i>	<i>spillover from application 3 on 2 (log of daily users)</i>
<i>indicatorM3</i>	0.309** (0.131)	0.220 (0.167)	0.176 (0.247)
<i>indicatorM2</i>	0.337** (0.157)	0.228 (0.208)	-0.0552 (0.339)
<i>indicatorM1</i>	0.351* (0.195)	0.384 (0.234)	0.0152 (0.397)
<i>indicator0</i>	0.397* (0.225)	0.597** (0.262)	0.0760 (0.462)
<i>indicator1</i>	0.712*** (0.256)	0.750** (0.296)	0.328 (0.533)
<i>indicator2</i>	0.751** (0.292)	0.769** (0.325)	0.347 (0.603)
<i>indicator3</i>	0.795** (0.322)	0.777** (0.355)	0.386 (0.679)
<i>indicator4</i>	0.775** (0.357)	0.772** (0.387)	0.342 (0.754)
<i>indicator5</i>	0.811** (0.390)	0.732* (0.416)	0.327 (0.831)
<i>indicator6</i>	0.818* (0.423)	0.685 (0.444)	0.292 (0.906)
<i>indicator7</i>	0.825* (0.458)	0.631 (0.477)	0.280 (0.986)
<i>indicator8</i>	0.836* (0.489)	0.664 (0.512)	0.258 (1.072)
<i>Constant</i>	5.963*** (0.546)	5.864*** (0.675)	7.437*** (0.856)
Observations	5,718	2,689	2,144
Number of dev-app-pairs	452	182	183
R-squared	0.074	0.095	0.151

Note: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; time dummies included but not displayed.

Figure 19: Time patterns of backward spillovers (OLS estimation)

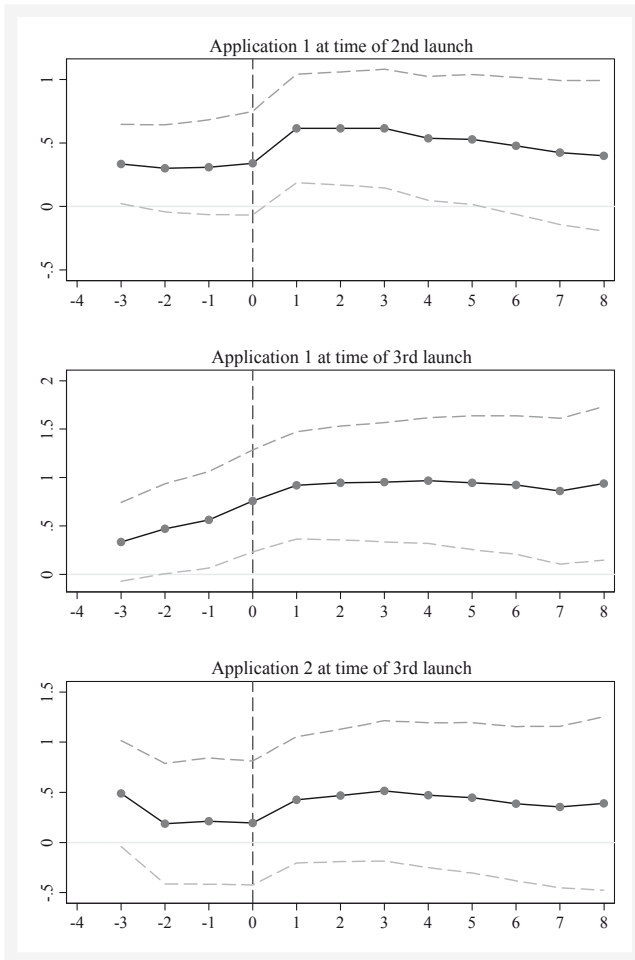


Figure 20: Time patterns of backward spillovers (OLS with additional covariates)

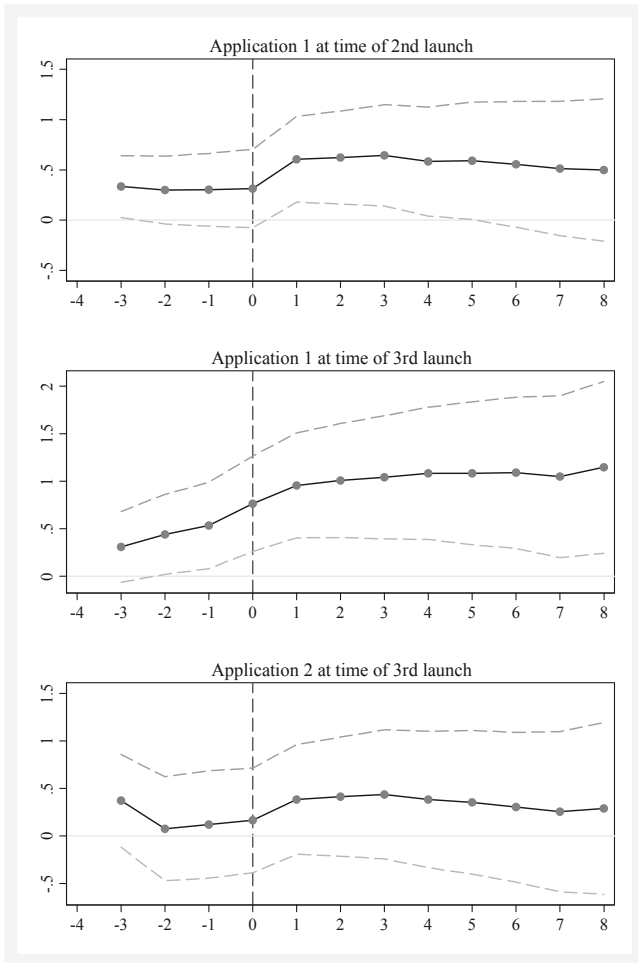
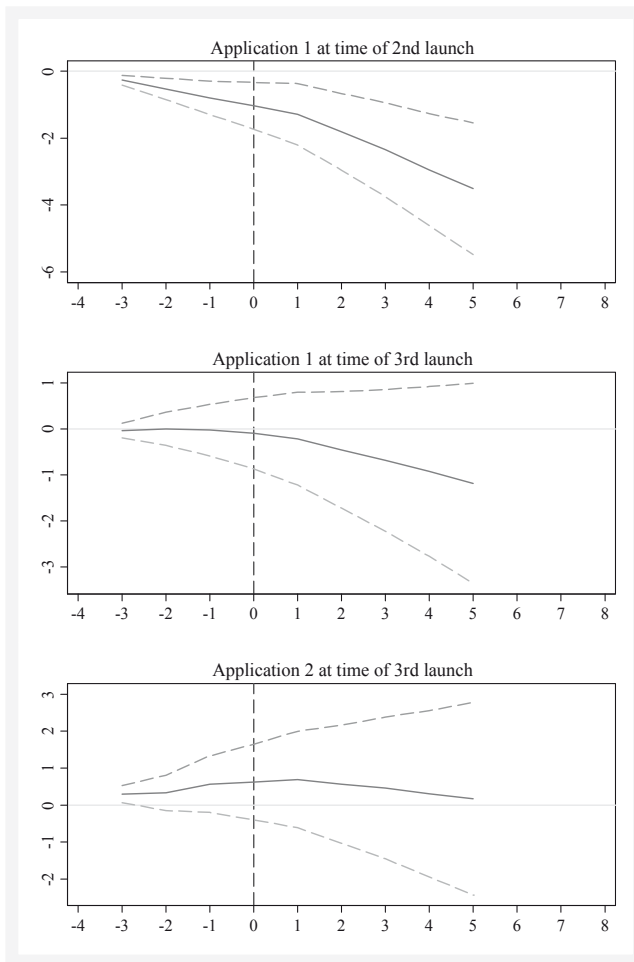


Figure 21: Time patterns of backward spillovers (first-difference panel model)<sup>159</sup>

<sup>159</sup> Note: Missing values at the end of the treatment window are a result of the setup of the first-difference model and the Stata-script that displays the regression results in graphical form.