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Article

Innovation Performance in Healthcare M&A: An Empirical Analysis

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Online-Appendix

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Appendix

Table A1: Poisson GEE regression results of only control variables

	Coef.	P-value	S.E.
ISO Country AU	−1.0606 ***	0.0	0.127
ISO Country BE	−0.5414 ***	0.001	0.17
ISO Country CA	−3.1923 ***	0.0	0.17
ISO Country CH	−0.6328 ***	0.007	0.257
ISO Country DE	−0.0718	0.247	0.105
ISO Country FR	−0.5027 **	0.025	0.256
ISO Country DK	−0.5088 ***	0.001	0.169
ISO Country GB	−0.1678	0.202	0.2
ISO Country JP	−0.1026	0.338	0.245
ISO Country NL	−1.6619 ***	0.0	0.192
Biotechnology	−0.2061 *	0.066	0.136
Health Care Equipment	−0.0053	0.482	0.115
Life Sciences Tools & Services	−0.9086 ***	0.0	0.118
Year 2009	1.0042 ***	0.0	0.136
Year 2010	1.0539 ***	0.0	0.14
Year 2011	0.9123 ***	0.0	0.13
Year 2012	0.8063 ***	0.0	0.111
Year 2013	0.799 ***	0.0	0.1
Year 2014	0.6727 ***	0.0	0.1
Year 2015	0.5078 ***	0.0	0.086
R&D expenses t-1	0.00002	0.123	0.0
Log. revenue t-1	−0.0676	0.341	0.164
Foreign Acquisitions t-1	0.0245	0.267	0.039
Foreign Acquisitions t-2	0.0099	0.385	0.034
Foreign Acquisitions t-3	−0.0618 **	0.042	0.036
Foreign Acquisitions t-4	−0.0574 **	0.027	0.03
Pre-sample patents	0.0007 ***	0.0	0.0
Intercept	4.355 ***	0.0	0.726

P-values originate from two-sided t-test for control variables, from one-sided t-test for independent variables. *Note*: *p<0.1; **p<0.05; ***p<0.01

Table A2: Negative binomial GEE regression results based on Ahuja and Katila (2001)

	Coef.	P-value	S.E.
No. non-tech. acquisitions t-1	0.0186	0.176	0.049
No. non-tech. acquisitions t-2	−0.0913 **	0.023	0.054
No. non-tech. acquisitions t-3	0.0036	0.235	0.048
No. non-tech. acquisitions t-4	−0.0368	0.112	0.048
Abs. size of acquired knowledge t-1	−0.0004 *	0.058	0.0
Abs. size of acquired knowledge t-2	−0.0002	0.121	0.0
Abs. size of acquired knowledge t-3	0.0002 *	0.071	0.0
Abs. size of acquired knowledge t-4	−0.0003 *	0.061	0.0
Rel. size of acquired knowledge t-1	−0.0671	0.233	0.776
Rel. size of acquired knowledge t-2	−0.3965	0.117	0.544
Rel. size of acquired knowledge t-3	−0.7443 ***	0.005	0.323
Rel. size of acquired knowledge t-4	0.017	0.236	0.239
Relatedness of target knowledge t-1	0.1573 **	0.019	0.089
Relatedness of target knowledge t-2	0.1861 ***	0.005	0.079
Relatedness of target knowledge t-3	0.3897 ***	0.0	0.111
Relatedness of target knowledge t-4	0.2318 ***	0.005	0.1
Relatedness of target knowledge^2 t-1	−0.0234 *	0.073	0.022
Relatedness of target knowledge^2 t-2	−0.019 *	0.09	0.021
Relatedness of target knowledge^2 t-3	−0.1685 ***	0.0	0.041
Relatedness of target knowledge^2 t-4	−0.0728 **	0.024	0.044
ISO Country AU	−0.8324 ***	0.0	0.134
ISO Country BE	−0.1395	0.226	0.185
ISO Country CA	−2.4208 ***	0.0	0.398
ISO Country CH	−1.0514 ***	0.004	0.393
ISO Country DE	−0.1087	0.329	0.246
ISO Country FR	−0.9388 ***	0.002	0.329
ISO Country DK	−0.1068	0.278	0.181
ISO Country GB	−0.0198	0.462	0.206
ISO Country JP	0.0222	0.462	0.236
ISO Country NL	−1.3417 ***	0.0	0.243
Biotechnology	0.0146	0.465	0.165
Health Care Equipment	−0.0136	0.466	0.161
Life Sciences Tools & Services	−0.3932 **	0.023	0.196
Year 2009	1.0102 ***	0.0	0.111
Year 2010	1.1283 ***	0.0	0.104
Year 2011	1.0299 ***	0.0	0.097
Year 2012	0.9928 ***	0.0	0.103
Year 2013	0.9379 ***	0.0	0.098
Year 2014	0.7306 ***	0.0	0.098
Year 2015	0.5487 ***	0.0	0.098
R&D expenses t-1	0.00004 *	0.057	0.0
Log. revenue t-1	−0.043	0.389	0.153
Foreign acquisitions t-1	0.0169	0.321	0.036
Foreign acquisitions t-2	0.0041	0.456	0.037
Foreign acquisitions t-3	−0.0231	0.221	0.03
Foreign acquisitions t-4	−0.0114	0.305	0.022
Pre-sample patents	0.001 ***	0.0	0.0
Intercept	3.5528 ***	0.0	0.579

P-values originate from two-sided t-test for control variables, from one-sided t-test for independent variables. *Note*: *p<0.1; **p<0.05; ***p<0.01

Table A3: Negative binomial GEE regression results of the author's model

	Coef.	P-value	S.E.
No. non-tech. acquisitions t-1	0.0423	0.11	0.055
No. non-tech. acquisitions t-2	−0.0806 **	0.037	0.056
No. non-tech. acquisitions t-3	0.0231	0.172	0.058
No. non-tech. acquisitions t-4	−0.0194	0.162	0.042
Abs. size of acquired knowledge t-1	−0.0005 **	0.036	0.0
Abs. size of acquired knowledge t-2	−0.0002 *	0.092	0.0
Abs. size of acquired knowledge t-3	0.0001	0.169	0.0
Abs. size of acquired knowledge t-4	−0.0003 **	0.034	0.0
Rel. size of acquired knowledge t-1	−0.1633	0.211	0.821
Rel. size of acquired knowledge t-2	−0.5348	0.115	0.725
Rel. size of acquired knowledge t-3	−0.9657 **	0.023	0.573
Rel. size of acquired knowledge t-4	−0.0659	0.219	0.424
Relatedness of target knowledge t-1	0.146 **	0.024	0.087
Relatedness of target knowledge t-2	0.1728 **	0.01	0.084
Relatedness of target knowledge t-3	0.3866 ***	0.0	0.109
Relatedness of target knowledge t-4	0.2759 ***	0.002	0.106
Relatedness of target knowledge^2 t-1	−0.0237 *	0.069	0.022
Relatedness of target knowledge^2 t-2	−0.0204 *	0.086	0.022
Relatedness of target knowledge^2 t-3	−0.1732 ***	0.0	0.042
Relatedness of target knowledge^2 t-4	−0.0796 **	0.011	0.04
Relatedness of acquirer knowledge t-1	0.7479	0.12	1.054
Relatedness of acquirer knowledge t-2	0.6193	0.151	1.196
Relatedness of acquirer knowledge t-3	0.7896	0.11	1.02
Relatedness of acquirer knowledge t-4	−0.013	0.247	0.791
ISO Country AU	−0.8585 ***	0.0	0.14
ISO Country BE	−0.1525	0.204	0.184
ISO Country CA	−2.4473 ***	0.0	0.344
ISO Country CH	−0.9621 ***	0.003	0.352
ISO Country DE	−0.1152	0.331	0.263
ISO Country FR	−0.8172 ***	0.002	0.285
ISO Country DK	−0.1356	0.227	0.181
ISO Country GB	−0.0196	0.46	0.196
ISO Country JP	−0.0179	0.469	0.23
ISO Country NL	−1.4292 ***	0.0	0.244
Biotechnology	−0.002	0.495	0.164
Health Care Equipment	0.0035	0.49	0.147
Life Sciences Tools & Services	−0.4166 ***	0.006	0.167
Year 2009	0.918 ***	0.0	0.166
Year 2010	1.0416 ***	0.0	0.146
Year 2011	0.9655 ***	0.0	0.135
Year 2012	0.9329 ***	0.0	0.124
Year 2013	0.8882 ***	0.0	0.115
Year 2014	0.6955 ***	0.0	0.108
Year 2015	0.534 ***	0.0	0.101
R&D expenses t-1	0.00003 *	0.071	0.0
Log. revenue t-1	0.0183	0.442	0.125
Foreign acquisitions t-1	0.0144	0.347	0.036
Foreign acquisitions t-2	0.0049	0.448	0.038
Foreign acquisitions t-3	−0.0228	0.224	0.03
Foreign acquisitions t-4	−0.0101	0.346	0.025
Pre-sample patents	0.001 ***	0.0	0.0
Acquisition experience t-1	−0.0173	0.192	0.02
Intercept	3.4448 ***	0.0	0.535

P-values originate from two-sided t-test for control variables, from one-sided t-test for independent variables. *Note*: $^*p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Table A4: List of all 41 firms in the sample and their respective GICS industry

No.	RIC	Name	Country	GICS Sub Industry
1	ABT	Abbott Laboratories	US	Health Care Equipment
2	AMGN	Amgen	US	Biotechnology
3	4503	Astellas Pharma	JP	Pharmaceuticals
4	AZN	Astrazeneca	GB	Pharmaceuticals
5	BIIB	Biogen	US	Biotechnology
6	BCR	CR Bard	US	Health Care Equipment
7	BAX	Baxter International	US	Health Care Equipment
8	BDX	Becton Dickinson	US	Health Care Equipment
9	VRX	Valeant	CA	Pharmaceuticals
10	BSX	Boston Scientific	US	Health Care Equipment
11	BMY	Bristol Myers Squibb	US	Pharmaceuticals
12	CSL	CSL	AU	Biotechnology
13	4568	Daiichi Sankyo	JP	Pharmaceuticals
14	4523	Eisai	JP	Pharmaceuticals
15	FME	Fresenius Medical Care	DE	Health Care Equipment
16	GILD	Gilead Sciences	US	Biotechnology
17	GSK	Glaxosmithkline	GB	Pharmaceuticals
18	JNJ	Johnson & Johnson	US	Pharmaceuticals
19	LLY	Eli Lilly	US	Pharmaceuticals
20	MDT	Medtronic	US	Health Care Equipment
21	MRK	Merck & Company	US	Pharmaceuticals
22	MYL	Mylan	NL	Pharmaceuticals
23	NOVN	Novartis	CH	Pharmaceuticals
24	NOVOB	Novo Nordisk	DK	Pharmaceuticals
25	PKI	Perkinelmer	US	Life Sciences Tools & Services
26	PFE	Pfizer	US	Pharmaceuticals
27	ROG	Roche	CH	Pharmaceuticals
28	SASY	Sanofi	FR	Pharmaceuticals
29	SHP	Shire	GB	Pharmaceuticals
30	SN.L	Smith & Nephew	GB	Health Care Equipment
31	SYK	Stryker	US	Health Care Equipment
32	4502	Takeda Pharmaceutical	JP	Pharmaceuticals
33	4543	Terumo	JP	Health Care Equipment
34	TMO	Thermo Fisher Scientific	US	Life Sciences Tools & Services
35	UCB	UCB	BE	Pharmaceuticals
36	WAT	Waters	US	Life Sciences Tools & Services
37	STJ	St Jude Medical	US	Health Care Equipment
38	AGN	Allergan	US	Pharmaceuticals
39	DHN	Danaher	US	Health Care Equipment
40	A	Agilent Technologies	US	Health Care Equipment
41	BAYGn	Bayer	DE	Pharmaceuticals

Figure A1: Scatter plot of variables

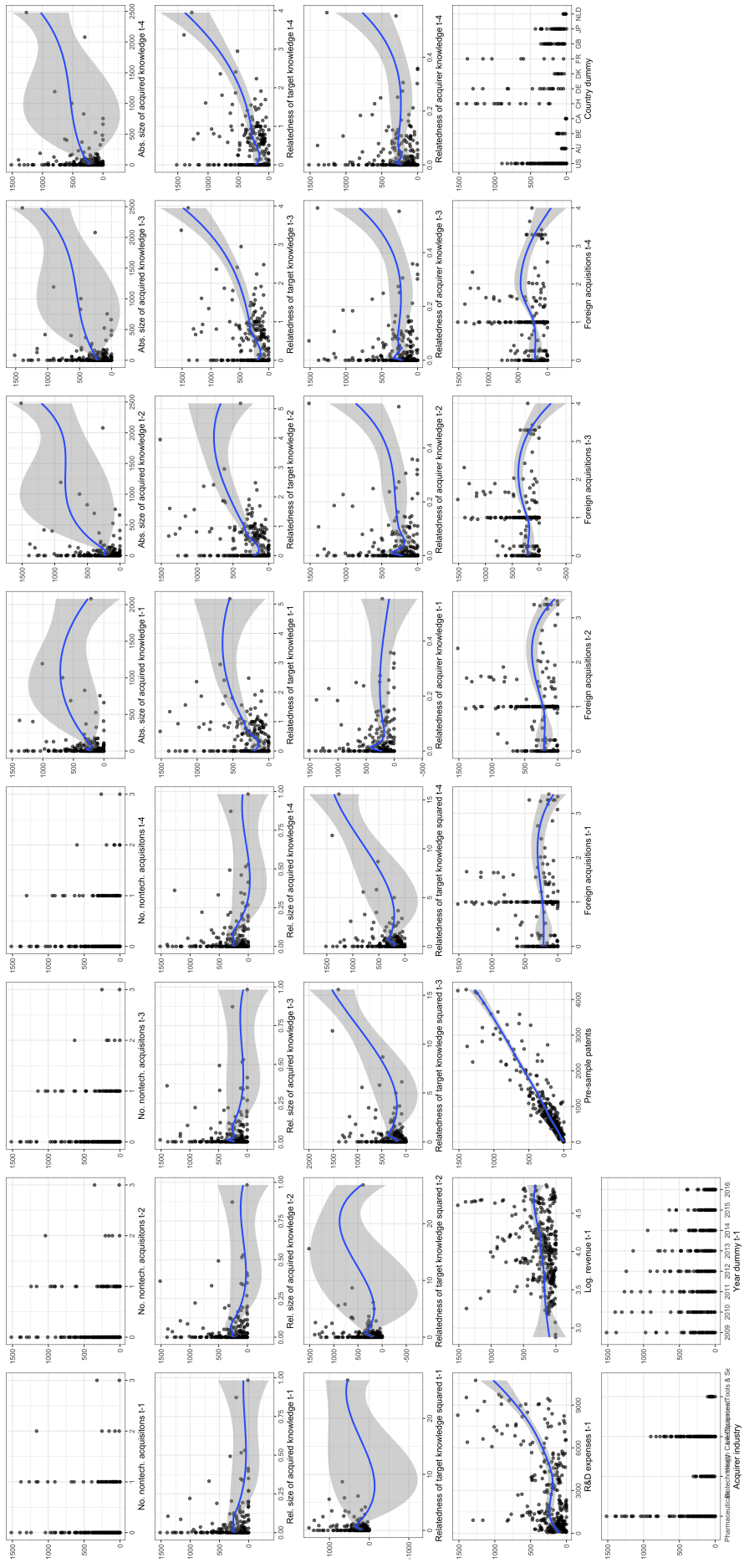

Figure A2: Scatter plot of summed variables