

A star is born: when financial conflicts of interest give rise to publication bias

MAER-Net Colloquium

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Outline

1. Introduction
2. Preliminary Data & Methodology
3. Descriptive Statistics
4. Preliminary Results
5. What's Next?
6. Questions for Discussion

Publication Bias

- ▶ **Publication bias**: increasing probability to be published as one presents statistically significant results (Brodeur *et al.*, 2020).
- ▶ Multiple studies conducted in economics to analyze **what can impact publication bias**:
 - ▶ Mandatory data-sharing policies (Askarov *et al.*, 2023)
 - ▶ Editorial statement aiming at research integrity (Blanco-Perez and Brodeur, 2020)
 - ▶ Peer-review process (Brodeur *et al.*, 2023)

Conflict of Interest (COI)

- ▶ Medical literature extensively studied the impact of Conflict of Interests (COI) on publication bias (Anglemyer *et al.*, 2015; Gerrits *et al.*, 2020; Waddell, 2009). Gap in **the economic literature**.



Figure 1: Central Bank vs Academic Perspectives on QE Effectiveness (Fabo *et al.*, 2021)

- ▶ Financial Conflict of Interest (**FCOI**) refers to all financial incentives that could influence an individual's decisions.

Affiliations and Fundings to build FCOI

- ▶ **Medical field:** Database track payments between researchers and institutions for specific projects.
- ▶ **Economic field:** Inspiration of Anglemyer *et al.*, (2015). FCOI proxied by authors' **affiliations and fundings**.

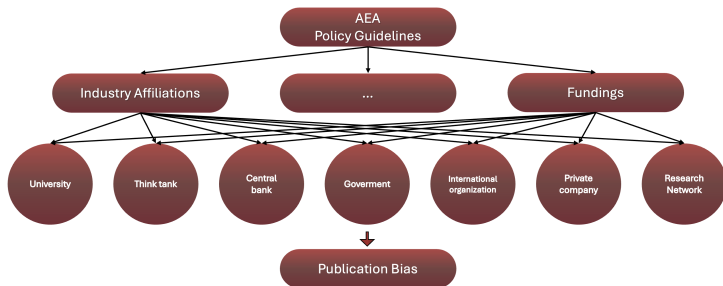


Figure 2: Fundings and affiliations to approximate FCOI

Research Question

- ▶ H_0 : Risk of FCOI induced by a type i affiliation/funding **has no impact** on publication bias
- ▶ H_1 : Risk of FCOI induced by a type i affiliation/funding **has an impact** on publication bias

How does the prevalence of publication bias vary with the nature of potential FCOI in economics?

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Measure of Publication Bias

Publication bias is measured using discontinuities in the distribution of published z-values (Brodeur *et al.*, 2020; Bruns *et al.*, 2019; Gerber and Malhotra, 2008).

Two databases are merged together to form our main dataset with estimated z-values :

▶ DORIS

- ▶ Definition: Automated tool to scrape statistical values from HTML files.
- ▶ Example: Bruns *et al.*, (2023) used DORIS to scrape the top 50 economic journals (=4,025 articles).

▶ Web of Science (WOS)

- ▶ Definition: Database providing broader information about the articles and their authors.
- ▶ Example: Number of citations each article has received, DOI, etc.

Measure of the Risk of FCOI: Data Collection

Two different methods to proxy FCOI:

1. Affiliations: Use OpenAlex, which scraped the authors' raw affiliations of 3,874 economic papers among the 4,024 in the database.



2. Fundings: Use Crawl4AI to extract each article's full-text PDF, spaCy to capture relevant sentences, and an AI API to extract funding agencies.



Classification



University



Think tank



Central bank



Government ministry/agency



International organization



Private company



Research network

Measure of the Risk of FCOI: Measurement

Two different methods to proxy FCOI:

- 1. Affiliations:** High potential number of affiliations per paper: Use the share of authors affiliated with a given type of institution to measure heterogeneity in the nature of incentives.
- 2. Fundings:** Low potential number of fundings per paper: Use dummy variables for at least receiving funding from a type of institution.



Caliper regression

$$Pr(\text{Significant}_{iajt} = 1) = \Phi(\alpha + \gamma_j + \omega_t + \beta_1 A_{ajt} + \beta_2 F_{ajt} + X'_{iajt} \delta). \quad (1)$$

- ▶ γ_j : Journal fixed effects
- ▶ ω_t : Time fixed effects
- ▶ A_{ajt} : Affiliation concentration measure
- ▶ F_{ajt} : Funding binary variable
- ▶ X'_{iajt} : Test and article covariates

Note: for a test i in article a in journal j at time t. SEs clustered at the article level

We test the following hypothesis:

- ▶ $H_0 : \beta_{1c} = 0$ (Risk of FCOI induced by a type c affiliation has no impact on publication bias)
- ▶ $H_0 : \beta_{2c} = 0$ (Risk of FCOI induced by a type c funding has no impact on publication bias)

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Descriptive Statistics on Affiliations

Table 1: Significant results by affiliation type — shares (%)

	Affiliation	All tests			Main tests		
		1%	5%	10%	1%	5%	10%
1	University	39.7	51.6	58.1	44.1	57.5	64.1
2	Non University	39.6	51.2	57.6	44.1	57.4	63.9
	2.1 Think Tank	39.9	51.2	57.4	45.4	58.2	64.6
	2.2 Central Bank	40.6	52.1	58.5	44.6	57.3	64.1
	2.3 <i>Private</i>	33.4	44.9	52.3	39.3	53.0	60.3
	<i>Priv x Univ</i>	32.4	44.0	51.4	39.2	52.8	59.9
	2.4 Ministries	42.0	53.9	59.8	42.7	56.3	62.8
	2.5 International	41.2	53.1	59.4	44.5	58.0	64.4
3	Only University	39.9	51.9	58.5	44.0	57.4	64.0
4	Only Private	38.0	48.8	56.4	51.8	67.4	72.0
5	Mix	39.7	51.3	57.6	44.0	57.3	63.8

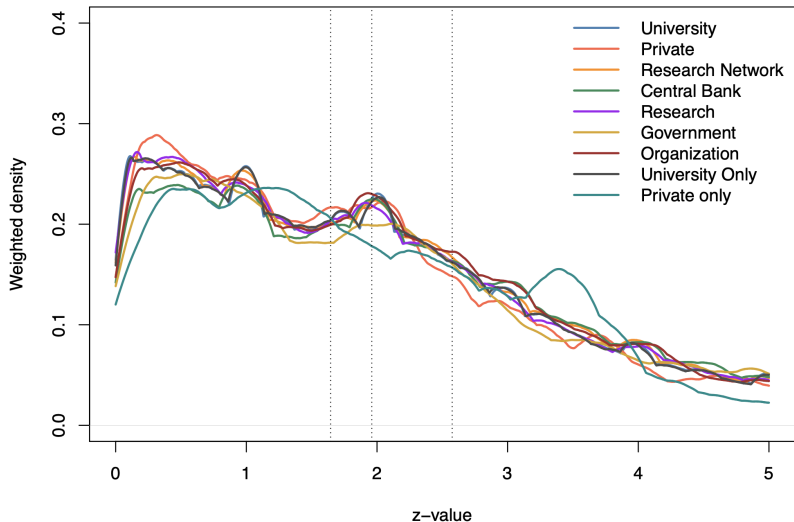
Descriptive Statistics on Affiliations

Table 2: Significant results by affiliation type (within window) — shares (%)

	Affiliation	All tests			Main tests		
		1%	5%	10%	1%	5%	10%
1	University	42.5	49.0	50.2	43.3	52.4	54.1
2	Non University	43.8	48.3	49.5	44.1	51.9	53.8
2.1	Think Tank	44.1	48.1	49.3	44.5	51.7	53.9
2.2	Central Bank	44.3	48.0	49.1	45.4	50.4	53.5
2.3	<i>Private</i>	38.7	45.0	48.2	39.3	50.1	52.1
	<i>Priv x Univ</i>	37.8	45.0	48.1	40.1	50.6	52.4
2.4	Ministries	42.6	51.5	51.1	43.4	51.8	53.4
2.5	International	44.6	48.9	50.2	44.6	52.9	53.5
3	Only University	42.2	49.2	50.5	43.0	52.5	54.1
4	Only Private	42.6	42.9	45.9	33.3	59.3	45.6
5	Mix	43.8	48.4	49.5	44.2	51.9	54.0

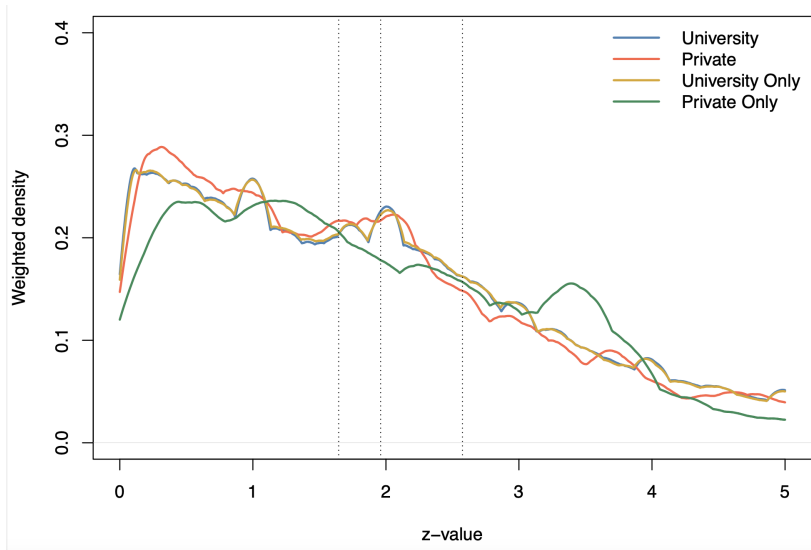
Descriptive Statistics on Affiliations

Figure 3: z-curves for all affiliation categories



Descriptive Statistics on Affiliations

Figure 5: z-curves for specific categories of affiliation



Descriptive Statistics on Affiliations

Table 3: Proportion test by affiliation: university mixed with private and CB

Panel A: Whole sample							
Cutoff	Univ only (1)	Univ × Priv (2)	Univ × CB (3)	Δ1-2	Δ1-3	Δ2-3	
1%	0.399	0.324	0.412	0.075***	-0.013***	-0.088***	
5%	0.519	0.440	0.522	0.079***	-0.003	-0.082***	
10%	0.585	0.514	0.584	0.071***	0.001	-0.070***	
Panel B: ±0.10 around cutoff							
Cutoff	Univ only (1)	Univ × Priv (2)	Univ × CB (3)	Δ1-2	Δ1-3	Δ2-3	
1%	0.469	0.433	0.465	-0.036	0.004	-0.032	
5%	0.566	0.520	0.570	-0.046**	-0.004	-0.050**	
10%	0.523	0.499	0.503	0.024	0.020	-0.003	

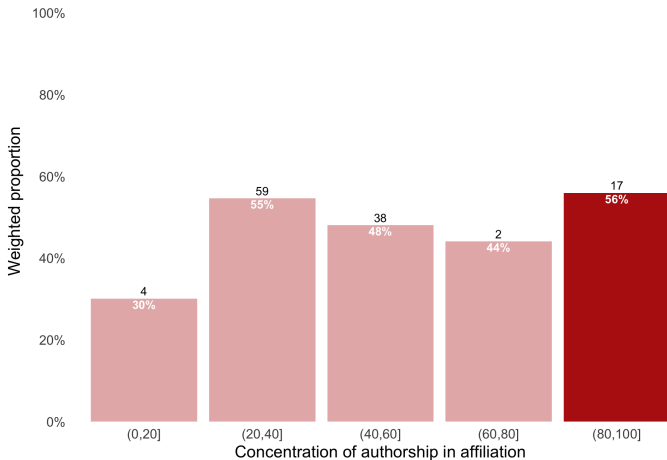
Notes: Panel A reports shares over the whole sample with $|z| \geq \text{cutoff}$. Panel B restricts to observations within ± 0.10 of each cutoff and reports shares ($z \geq \text{cutoff}$).

Differences are from two-sample proportion tests.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Descriptive Statistics on Affiliations

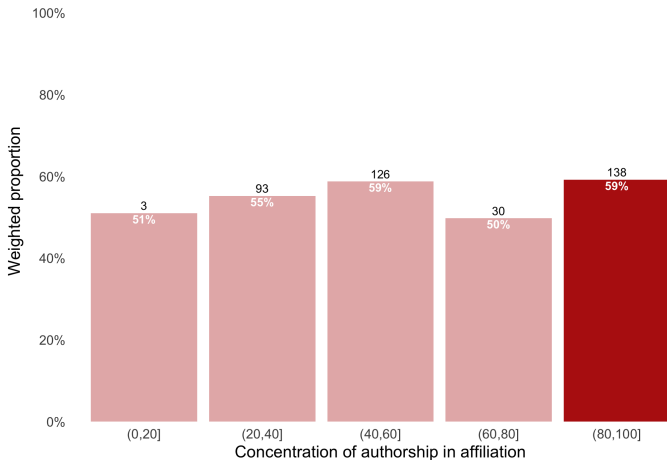
Figure 7: Significant results across private concentration in authorship



Notes: White numbers indicate the weighted share of significant tests at a 5% level. Black numbers indicate the number of articles that fall into a given category. Weights are applied at the article level: each article has a weight of one in the bins.

Descriptive Statistics on Affiliations

Figure 8: Significant results across central bank concentration in authorship



Notes: White numbers indicate the weighted share of significant tests at a 5% level. Black numbers indicate the number of articles that fall into a given category. Weights are applied at the article level: each article has a weight of one in the bins.

Descriptive Statistics on Fundings

Table 4: Descriptive statistics by funding type — shares (%)

	Funding type	All tests			Main tests		
		1%	5%	10%	1%	5%	10%
1	University	38.5	50.2	56.9	42.3	55.6	62.6
2	Non University	38.6	50.2	56.7	43.6	56.7	63.6
	2.1 Think Tank	35.9	47.3	53.8	39.8	52.9	60.2
	2.2 Central Bank	38.0	49.5	56.3	40.5	54.2	61.1
	2.3 <i>Private</i>	38.6	50.7	57.2	39.9	54.2	61.2
	<i>Priv x Univ</i>	35.9	47.7	54.6	36.9	51.6	59.5
	2.4 Ministries	37.9	49.9	56.5	45.0	58.5	65.3
	2.5 International	40.1	51.4	58.1	43.7	56.1	62.8
3	Only University	39.1	50.6	57.4	43.1	56.2	63.0
4	Only Private	39.4	51.7	57.5	49.4	63.0	67.5
5	Mix	39.9	51.8	58.3	44.1	57.5	64.1
6	Funded	39.0	50.5	57.0	43.4	56.5	63.3
7	Not Funded	40.2	52.3	58.8	44.4	57.9	64.3

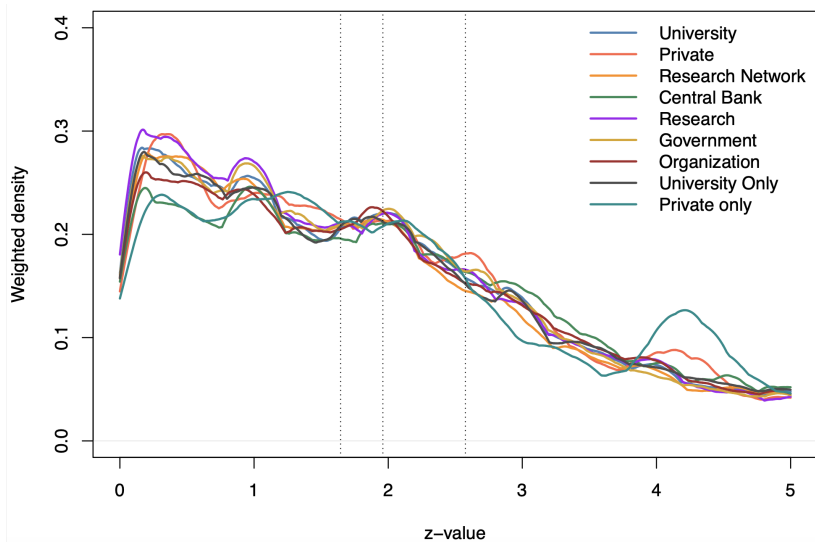
Descriptive Statistics on Fundings

Table 5: Significant results by funding type (within window) — shares (%)

	Funding type	All tests			Main tests		
		1%	5%	10%	1%	5%	10%
1	University	43.0	48.1	49.7	42.9	51.2	55.0
2	Non University	43.6	48.0	49.4	43.9	51.0	53.8
	2.1 Think Tank	43.0	47.5	49.0	42.0	49.5	53.9
	2.2 Central Bank	43.9	46.3	49.1	43.1	50.8	52.2
	2.3 <i>Private</i>	44.0	48.1	48.8	44.0	51.4	52.5
	<i>Priv x Univ</i>	44.0	46.7	48.5	42.6	49.5	55.9
	2.4 Ministries	43.8	48.8	50.0	45.2	52.0	54.6
	2.5 International	43.2	47.1	49.8	44.1	49.9	52.5
3	Only University	43.4	47.5	49.3	44.2	51.9	55.0
4	Only Private	41.1	49.8	46.0	49.5	58.7	49.4
5	Mix	42.6	49.1	50.3	43.2	52.3	54.0
6	Funded	43.5	47.9	49.3	44.0	51.1	53.9
7	Not Funded	42.3	49.5	50.6	43.0	52.9	54.1

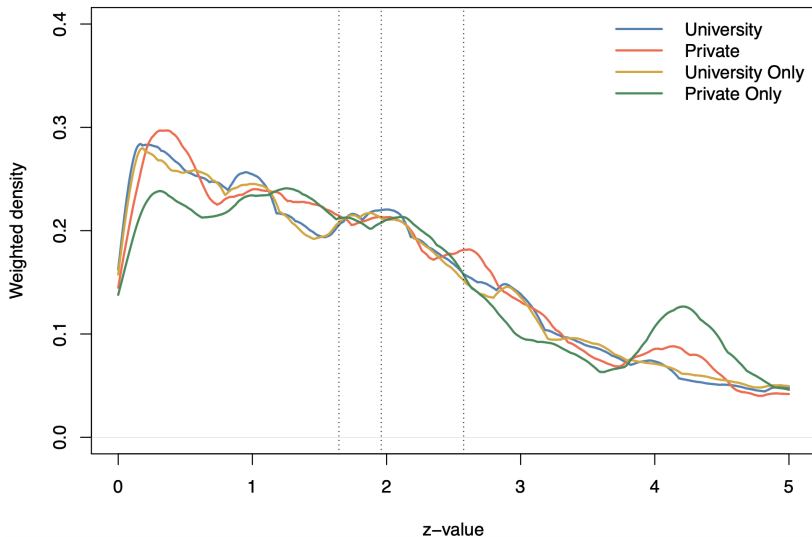
Descriptive Statistics on Fundings

Figure 9: z-curves for all funding categories



Descriptive Statistics on Fundings

Figure 10: z-curves for specific categories of funding



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Caliper regression — Full dataset

	Affiliation	1%	5%	10%
0	Intercept	.005	.257 ^{***}	.413 ^{***}
1	University	-.001 [*]	-.001	-.001
2	Think Tank	.000	-.000	-.000
3	Central Bank	-.001	-.001	-.001
4	Government	.001	.000	.000
5	International Org.	-.000	-.000	-.000
6	Private Company	-.002	-.003	-.003
7	Research Network	-.000	-.000	-.000
	<i>Observations</i>	520,595	520,595	520,595
	<i>Journal FE</i>	✓	✓	✓
	<i>Time FE</i>	✓	✓	✓
	<i>Clustered SE</i>	✓	✓	✓

Notes: Asterisks indicate significance levels (^{*} $p < .10$, ^{**} $p < .05$, ^{***} $p < .01$). Negative values imply a lower publication bias. Standard errors are clustered at the *article* level.

Caliper regression — Window 0.10

	Affiliation	1%	5%	10%
0	Intercept	-.038	.049	.047
1	University	-.001	.001	.000
2	Think Tank	.000	-.000	-.000
3	Central Bank	-.001*	.002**	-.001
4	Government	.001	-.000	-.001
5	International Org.	-.000	.002**	-.002***
6	Private Company	.002	-.003*	-.002
7	Research Network	.001	.001**	.000
	<i>Observations</i>	16,549	23,725	21,504
	<i>Journal FE</i>	✓	✓	✓
	<i>Time FE</i>	✓	✓	✓
	<i>Clustered SE</i>	✓	✓	✓

Notes: Asterisks indicate significance levels (* $p < .10$, ** $p < .05$, *** $p < .01$). The dependent variable equals 1 if a test is significant at the indicated threshold and 0 otherwise. Negative values imply a lower publication bias. Standard errors are clustered at the *article* level.

Caliper regression — Window 0.05

	Affiliation	1%	5%	10%
0	Intercept	.052	.443 ^{***}	.019
1	University	-.001	.001	-.001
2	Think Tank	.000	-.001	.000
3	Central Bank	-.001	.001	.000
4	Government	.000	-.001	-.003 ^{**}
5	International Org.	-.000	.001	-.002 ^{**}
6	Private Company	.002	-.005 ^{**}	-.005 [*]
7	Research Network	.001 ^{**}	.002 ^{***}	.001
	<i>Observations</i>	7,822	13,949	10,877
	<i>Journal FE</i>	✓	✓	✓
	<i>Time FE</i>	✓	✓	✓
	<i>Clustered SE</i>	✓	✓	✓

Notes: Asterisks indicate significance levels (* $p < .10$, ** $p < .05$, *** $p < .01$). The dependent variable equals 1 if a test is significant at the indicated threshold and 0 otherwise. Negative values imply a lower publication bias. Standard errors are clustered at the *article* level.

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What's Next?

▶ **Regressions:**

1. Relate significance outcomes to the funding variables.
2. Add control variables at the test and article levels.
3. Weight the caliper regression by the number of tests per article.

▶ **Robustness:**

1. Stress-test with alternative concentration measures.
2. Use placebo cutoffs.
3. Include PDS-Lasso controls.

▶ **FCOI perspective:**

1. Interact affiliation concentration measures with their corresponding funding variables.
2. Explore the effect of affiliations with the same institution.

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Questions for Discussion

▶ Regression:

1. Which control variables should we consider adding?
2. Is it risky to include both journal and time fixed effects alongside affiliations? Some affiliations may be more prevalent in specific journals (i.e., central banks)




▶ Measurement:

1. Should we frame this as differences in the *nature* of FCOI or as *degrees* of FCOI?



▶ Effects:

1. How can we explain why private affiliations show a lower degree of publication bias on average?
2. Why does government show no effect?

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Appendix I

Table 6: Descriptive statistics by affiliation types

		Full dataset	Main test	N. articles	1% All	1% Main	5% All	5% Main	10% All	10% Main
1	University	560,628	166,495	3,710	39.703	44.112	51.599	57.500	58.130	64.091
2	Non University	173,824	50,529	1,139	39.624	44.141	51.218	57.383	57.551	63.945
2.1	Think Tank	80,136	22,789	512	39.890	45.399	51.166	58.186	57.355	64.601
2.2	Central Bank	54,286	16,392	374	40.561	44.619	52.109	57.333	58.453	64.062
2.3	Private	16,592	4,371	112	33.365	39.282	44.949	52.963	52.326	60.261
2.4	Ministries	9,280	2,876	73	42.015	42.698	53.858	56.328	59.817	62.796
2.5	International	41,016	12,151	219	41.245	44.482	53.091	58.028	59.438	64.423
3	Only University	429,151	127,901	2,844	39.870	44.044	51.899	57.444	58.488	64.048
4	Only Private	938	282	8	38.060	51.773	48.827	67.376	56.397	71.986
5	Mix	176,531	51,506	1,172	39.694	44.043	51.269	57.259	57.588	63.822

Appendix II

Table 7: Descriptive statistics by funding type

		Full dataset	Main test	N. articles	1% All	1% Main	5% All	5% Main	10% All	10% Main
1	University	102,178	30,983	716	38.552	42.336	50.219	55.618	56.859	62.625
2	Non University	132,948	40,023	946	38.613	43.562	50.170	56.732	56.704	63.596
2.1	Think Tank	46,412	13,483	332	35.864	39.754	47.261	52.881	53.801	60.231
2.2	Central Bank	19,768	5,602	134	37.965	40.450	49.489	54.159	56.298	61.139
2.3	Private	12,893	4,138	79	38.618	39.850	50.655	54.157	57.171	61.165
2.4	Ministries	58,932	18,784	468	37.949	45.017	49.873	58.545	56.531	65.343
2.5	International	33,709	9,868	187	40.087	43.727	51.449	56.080	58.094	62.789
3	Only University	55,113	16,060	355	39.105	43.070	50.641	56.158	57.364	63.001
4	Only Private	2,845	861	20	39.438	49.361	51.705	62.950	57.504	67.480
5	Mix	548,662	162,768	3,649	39.889	44.125	51.818	57.501	58.313	64.075
6	Funded	199,280	59,564	1,380	38.970	43.424	50.489	56.472	57.032	63.295
7	Not Funded	407,340	120,125	2,644	40.230	44.370	52.309	57.871	58.805	64.343

Appendix III

Table 8: Number of articles and tests by affiliation type (within window)

	Affiliation	Full-1%	Main-1%	Articles-1%	Full-5%	Main-5%	Articles-5%	Full-10%	Main-10%	Articles-10%
1	University	88,002	30,312	3,566	114,542	35,412	3,594	120,107	34,468	3,573
2	Non University	26,860	9,086	1,100	34,515	10,646	1,103	36,706	10,545	1,095
2.1	Think Tank	12,165	3,996	498	15,576	4,688	498	16,559	4,588	494
2.2	Central Bank	8,381	2,911	356	10,728	3,421	360	11,492	3,401	357
2.3	Private	2,422	731	107	3,578	1,003	107	3,860	1,030	105
2.4	Ministries	1,477	553	69	1,751	599	71	1,816	584	71
2.5	International	6,598	2,244	217	8,184	2,546	216	8,641	2,565	214
3	Only University	67,944	23,231	2,732	88,542	27,262	2,754	92,393	26,456	2,741
4	Only Private	122	51	8	198	59	7	242	57	7
5	Mix	27,289	9,263	1,132	34,967	10,838	1,137	37,142	10,715	1,129

Appendix IV

Table 9: Number of articles and tests by funding type (within window)

	Affiliation	Full-1%	Main-1%	Articles-1%	Full-5%	Main-5%	Articles-5%	Full-10%	Main-10%	Articles-10%
1	University	15,703	5,482	686	20,784	6,705	695	22,285	6,618	695
2	Non University	20,486	7,151	907	26,744	8,601	921	28,815	8,605	913
2.1	Think Tank	6,864	2,280	316	9,322	2,979	319	10,222	3,061	320
2.2	Central Bank	3,028	1,053	126	3,976	1,238	128	4,345	1,223	125
2.3	Private	2,134	823	76	2,611	913	75	2,820	939	73
2.4	Ministries	9,375	3,525	451	12,161	4,119	459	13,020	4,029	455
2.5	International	5,073	1,626	181	6,755	2,030	183	7,234	2,089	182
3	Only University	8,497	2,873	341	11,285	3,430	343	12,103	3,357	344
4	Only Private	465	186	20	570	150	20	619	164	19
5	Mix	86,393	29,486	3,511	111,852	34,579	3,535	117,055	33,707	3,514
6	Funded	30,681	10,583	1,322	40,145	12,717	1,336	43,133	12,653	1,328
7	Non Funded	64,674	21,962	2,550	83,562	25,442	2,562	86,644	24,575	2,549

Appendix V

We use post-double selection (PDS) to select relevant variables. The PDS selects variables that satisfy $I_1 \cup I_2 \cup I_3$ where:

- ▶ The outcome variable is regressed on a high-dimensional set of covariates, and a subset of relevant predictors I_1 is selected using the Lasso.
- ▶ The treatment variable is similarly regressed on the same covariate set, yielding another selected subset I_2 .
- ▶ I_3 represents any fixed effects or variables included by design, regardless of their selection status.