



scidecode science consulting

De Castro, Herb, Rothfritz GbR



Plan S

Making full & immediate
Open Access a reality

A study to assess the impact of Plan S on the global scholarly communication ecosystem

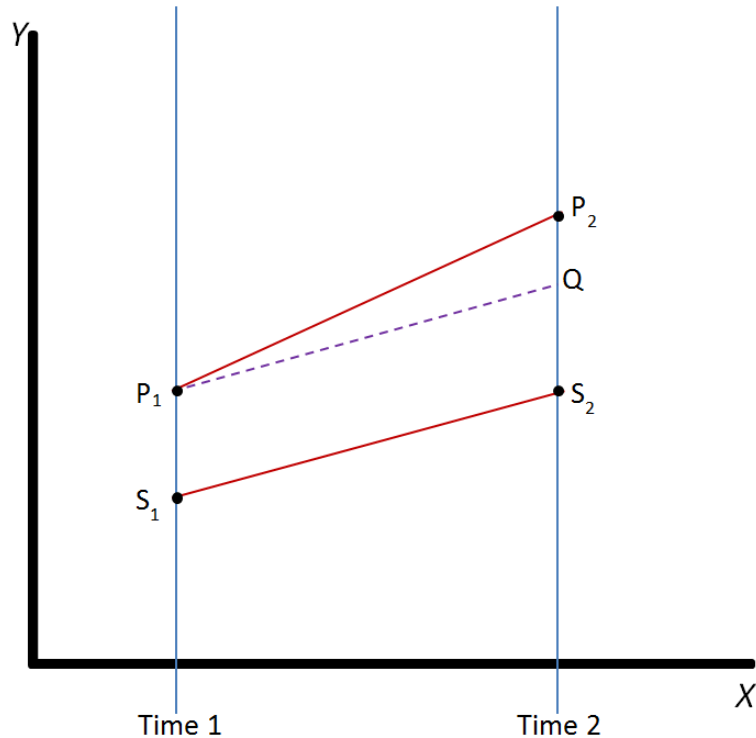
Counterfactual Impact Evaluation

W. Benedikt Schmal

Tue Apr 9th, 2024



The difference-in-differences method



- We want to examine the causal effect of a policy ideally
- Simple pre-post comparisons are not sufficient: What if general trends overshadow policy effect
- Solution: Compare to the control group and its difference over time: $S_2 - S_1$
- Difference in differences (simplified): $(P_2 - P_1) - (S_2 - S_1)$
- Parallels to RCTs in medical studies in the „real world“
- Challenges: The real world seldom provides randomization
- Many confounders – also in the case of Plan S



Ingredients of the CIE

- Strategy: Look at publications supported by specific funding agencies
- Investigate the likelihood of a supported paper to be published with a certain access type (closed, green, gold, hybrid OA)

Treatment group	Control group	Comparison group (2nd control)
<ul style="list-style-type: none">• FWF (Austria)• NCN (Poland)• HHMI (US)• NWO (NL)• UKRI (UK)	<ul style="list-style-type: none">• ANID/CONICYT (Chile)• MBIE (New Zealand)• NSFC (China)	<ul style="list-style-type: none">• FWO (Belgium)• DFG (Germany)• NCI (US)

- Timing: Pre/post cutoff date: January 1, 2021 – time frames: 2015 – 2020 (pre) and 2021 – 2023 (post)
- Data source: openAlex /OA.works (see also the blogpost by Pablo de Castro on the choice of the data provider: <https://scidecode.com/2024/01/22/choosing-a-data-sample-provider-for-our-study-on-the-impact-of-plan-s/>)

All data and code files will be made publicly available under a creative commons license

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Challenge: Parallel trends assumption

- For a difference-in-differences analysis, we assume “parallel trends” in the hypothetical absence of the treatment (here: introduction of Plan S)
- Plan S treatment group funders already had high OA shares among supported publications before Plan S → more difficult to substantially expand than
- Furthermore: Short “post” period (2021-2023) – treatment potentially yet to unfold



Difficult to obtain clear causal evidence, therefore scidecode uses a mixed methods approach including extensive qualitative analysis



Descriptive Statistics: OA flavors by funder

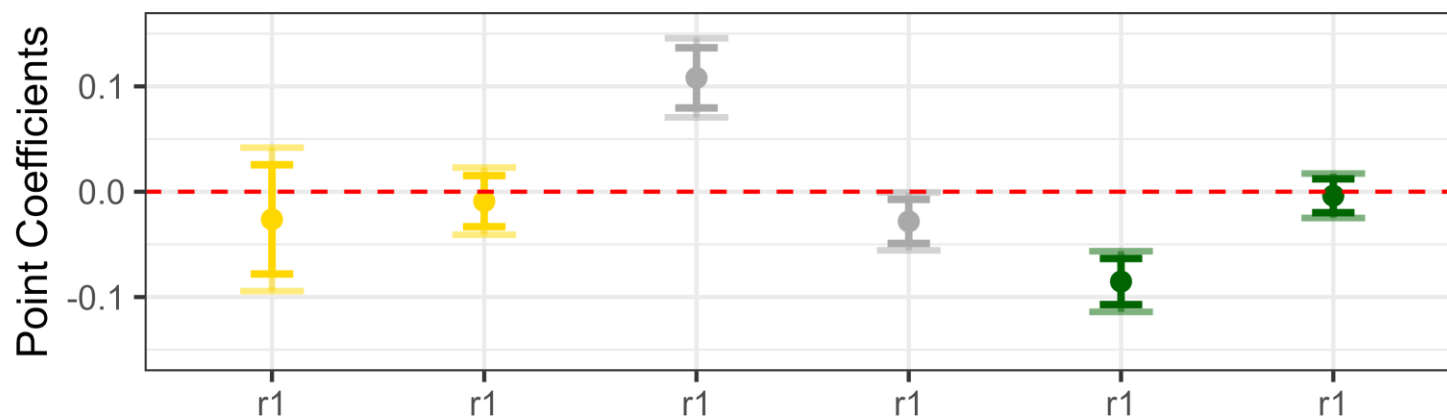
OA Flavor	PRE Plan S		POST Plan S		Total	PRE Plan S		POST Plan S		Total
	Number	Share	Number	Share		Number	Share	Number	Share	
	FWF					HHMI				
bronze	931	6,0%	167	1,8%	1.098	1.540	20,8%	46	2,8%	1.586
gold	3.420	22,0%	2.923	32,2%	6.343	2.374	32,0%	637	38,7%	3.011
green	3.020	19,4%	1.424	15,7%	4.444	1.161	15,7%	162	9,8%	1.323
hybrid	6.132	39,4%	3.786	41,8%	9.918	1.754	23,7%	559	34,0%	2.313
closed	2.066	13,3%	768	8,5%	2.834	580	7,8%	241	14,7%	821
Total	15.569		9.068		24.637	7.409		1.645		9.054
	NCN					NWO				
bronze	944	3,7%	256	1,4%	1.200	1.070	6,0%	210	1,7%	1.280
gold	5.365	21,0%	6.623	36,5%	11.988	3.628	20,4%	3.186	26,3%	6.814
green	3.479	13,6%	2.027	11,2%	5.506	4.524	25,4%	2.156	17,8%	6.680
hybrid	4.976	19,5%	4.724	26,0%	9.700	6.823	38,3%	5.691	46,9%	12.514
closed	10.808	42,3%	4.536	25,0%	15.344	1.776	10,0%	885	7,3%	2.661
Total	25.572		18.166		43.738	17.821		12.128		29.949
	UKRI					ALL Plan S Funders together				
bronze	7.091	5,1%	451	1,3%	7.542	11.576	5,6%	1.130	1,5%	12.706
gold	31.146	22,3%	10.267	29,8%	41.413	45.933	22,3%	23.636	31,3%	69.569
green	40.619	29,1%	5.033	14,6%	45.652	52.803	25,6%	10.802	14,3%	63.605
hybrid	51.127	36,6%	15.178	44,1%	66.305	70.812	34,4%	29.938	39,7%	100.750
closed	9.726	7,0%	3.467	10,1%	13.193	24.956	12,1%	9.897	13,1%	34.853
Total	139.709		34.396		174.105	206.080		75.403		281.483



Early findings: Changes within open access flavors

Pooled Comparison Among Open Access Flavors

Change among Plan S funders relative to others (w/o closed acc)



Relative to: ● Gold ● Hybrid ● Green

Negative coefficients imply a relatively weaker increase compared to the control/comparison group. Positive coefficients imply a relatively stronger increase compared to the control/comparison group. This holds for an overall increase. It is reversed in case of a decrease.

What do we see?

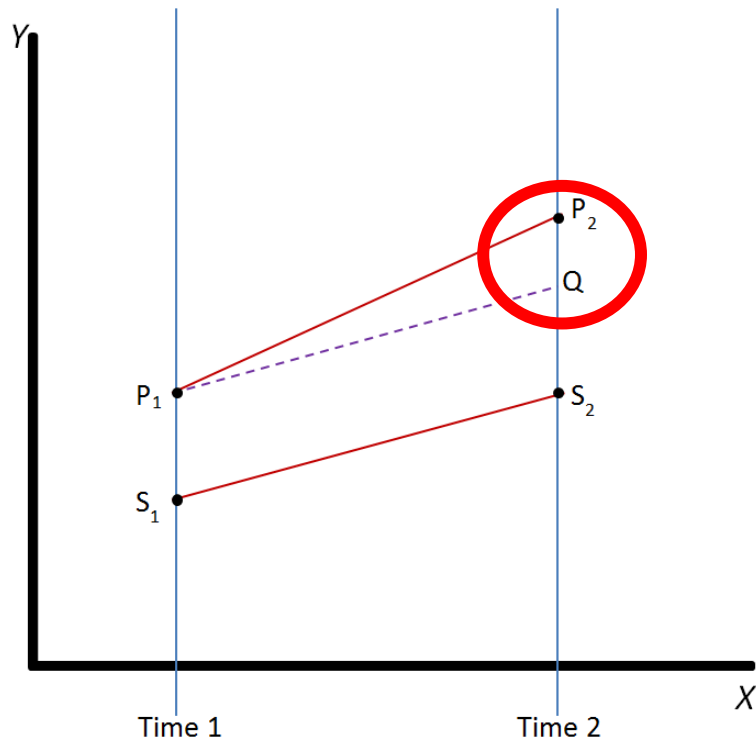
- Changes in the treatment „plan S“ group **relative** to the control/comparison group
- No statement regarding **absolute** changes
- Estimates with confidence bands crossing 0 are insignificant

Keep in mind the statistical challenges!

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