

# Dawning of a New Age? Replication Practices and Journal Data Policies

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# Agenda

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1. Benefits and Obstacles of Replications
2. Economics in a Replication Crisis?
3. Data Policies of Economics Journals
4. Different Ways Forward

# 1. Benefits of Replications

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Replications can help to ...

- filter statistically random results
- detect errors in data and analysis (intended or unintended)
- identify robust and generalizable results
- frame useful policy recommendations
- strengthen public trust in scientific findings
- support and accelerate the scientific knowledge process

# 1. Obstacles to Replications

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- Both in academia and in the policy sphere, there is more demand for novelty than for confirmation or refutation.
- Findings are often consumed as being either “true” or “false” and not as something with an uncertain reality status.
- Replications require effort and it might not be efficient to just replicate any finding.
- We do not have citation standards that disseminate findings of replications along with the original finding.

# 1. Types of Replications

Figure 1. Six different kinds of replications

<i>Measurement and/or analysis</i>	<i>Source of data/population</i>		
	<i>Same data set</i>	<i>Same population</i>	<i>Different population</i>
<i>Same</i>	(1) Reproduction	(3) Repetition	(5) Extension
<i>Different</i>	(2) Robustness analysis —same data set	(4) Robustness analysis —same population	(6) Robustness analysis —different population

Source: Author's own compilation.

IZA  
World of Labor

Source: Reed (2017)

## 2. Economics in a Replication Crisis?

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- Empirical turn and „credibility revolution“ in economics since the 1990s.
- More and more empirical research has been published and with better methods but rather low standards of reproducibility.
- There is a debate about reproducibility but not comparable to the one in psychology.

## 2. Economics in a Replication Crisis?

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- The claim „Most research results are false“ has caught quite some attention. In a narrow sense, this claim builds on a model of repeated sampling from an identical population.
- Outside experimental economics, we rarely draw from an identical population. When using aggregated data (BIP, inflation rate) we are closer to data for the full population, although with measurement error.

# 2. Economics in a Replication Crisis?

Table 3: Failed Replication Results, Including Causes of Failure, By Journal Type

	Paper Count	Percentage of Sample
<i>Panel A: All Journals</i>		
Replication Unsuccessful	38	100
Unsuccessful Because of:		
Missing Public Data or Code	21	55
Incorrect Public Data or Code	9	24
Missing Software	2	5
Proprietary Data	6	16
<i>Panel B: Journals With Mandatory Data and Code Policies</i>		
Replication Unsuccessful	16	100
Unsuccessful Because of:		
Missing Public Data or Code	6	38
Incorrect Public Data or Code	5	31
Missing Software	1	6
Proprietary Data	4	25
<i>Panel C: Journals Without Mandatory Data and Code Policies</i>		
Replication Unsuccessful	22	100
Unsuccessful Because of:		
Missing Public Data or Code	15	68
Incorrect Public Data or Code	4	18
Missing Software	1	5
Proprietary Data	2	9

## Non-reproducible research

Table 4: Successful Replication Results By Journal Type

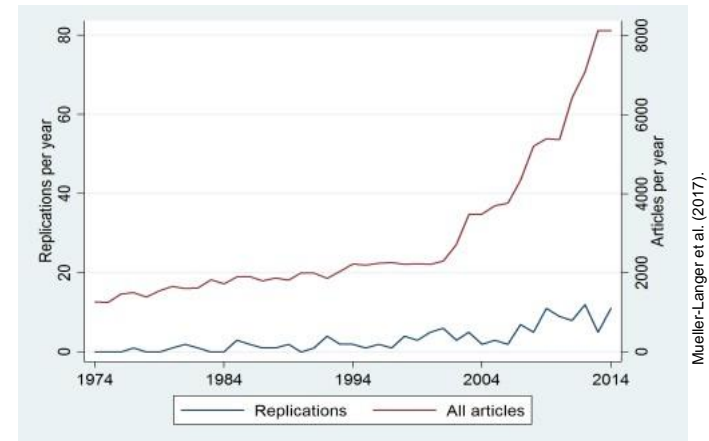
	Paper Count	Percentage of Sample
<i>Panel A: All Journals</i>		
Replication Successful	29	100
Successful:		
With Contacting Authors	7	24
Without Contacting Authors	22	76
<i>Panel B: Journals With Mandatory Data and Code Policies</i>		
Replication Successful	23	100
Successful:		
With Contacting Authors	3	13
Without Contacting Authors	20	87
<i>Panel C: Journals Without Mandatory Data and Code Policies</i>		
Replication Successful	6	100
Successful:		
With Contacting Authors	4	67
Without Contacting Authors	2	33

Chang & Li (2015).

replicate 29 of 59 papers (49%) with assistance from the authors. Because we are able to replicate less than half of the papers in our sample even with help from the authors, we assert that economics research is usually not replicable. We conclude with

Less than 50% of papers can be reproduced successfully (Chang & Li, 2015)

## Few replications



Mueller-Langer et al. (2017).

0.1% of all publications in economics are replications (Mueller-Langer et al., 2017)



## 2. Economics in a Replication Crisis?

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- There are a lot more informal replications than formal replications.
- Hamermesh (2017): Many research results have little impact anyway and failure to replicate them is unimportant.
- Tracking 10 heavily cited papers from the 1990s in top journals in labor economics, Hamermesh finds that 0.6 percent of the citing articles represented a replication of the original studies.
- On the other hand, 7 of the papers were replicated with the same data or different data at least 5 times and the other 3 papers once.

## 2. Few Replications as a Result of Disincentives

### Academic culture

„publish or perish“: number of publications is crucial for academic career

#### Original authors:

- no rewards for data sharing & documentation
- costs of documentation
- risk of damage to reputation in case of errors

#### (Formal) replicators:

- ex-ante risk of a positive replication
- no rewards
- no publication outlets

#### (Informal) replicators:

- low visibility of replication

### Journals (Economics):

- only 3% accept replications (-> citations per page, Impact Factor, ...)
- publication bias (-> preference for negative results)
- costs of publishing replications (review, communication etc.)

Result: Rational economists will not ‚waste‘ time with data sharing and replications as long as they don't have to!

### 3. Data Policies of Economics Journals

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- Dewald, Thursby & Anderson (1986): Errors in published empirical articles are “*a commonplace rather than a rare occurrence*” (Dewald, Thursby & Anderson, 1986, 587f)
  - McCullough (2009): Since 1993, in total 17 (top-)journals with mandatory data policies with archives for data/code
  - Vlaeminck (2013): 40 out of 141 journals (28.4%) with data policy
  - Vlaeminck & Herrmann (2015): 71 out of 346 journals (20.5%) with data policy
  - Höffler (2017): 343 journals in study, 185 with a data policy (53.9%)
  - Chin & Dong (2019): Of 74 journals listed in the *Tilburg Top 100 Ranking*, 58 had a data availability policy (75.7%), 34 of these had a mandatory policy (58.6%)
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# 3. Study\* on Data Policies of Economics Journals

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*Aims:* The study illustrates ...

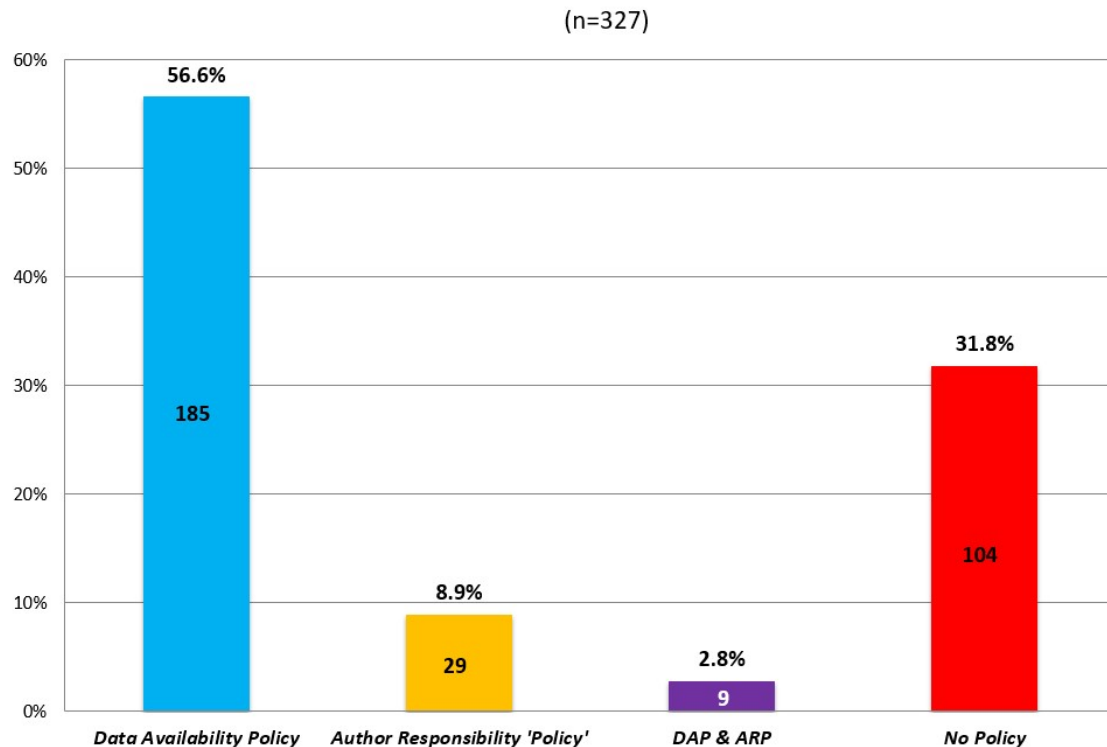
- ... the number of economics journals with data policies,
- ... the types of data policies in use,
- ... the requirements of these policies (-> files, information, degree of obligation, handling of restricted data,...)
- ... the changes in the field since 2014.

# 3. Methodology of the Study

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- Content analysis: a structured, systematic coding scheme (-> codebook) is applied to selected text passages
- Selected paragraphs: ‚Information for Authors‘/ ‚Duties of Authors‘ - sections of the journals & dedicated data policies (but: online resources only)
- Sample: 353 journals listed in the Clarivate Journal Citation Reports Edition 2017 for Economics (-> Impact Factor® journals)

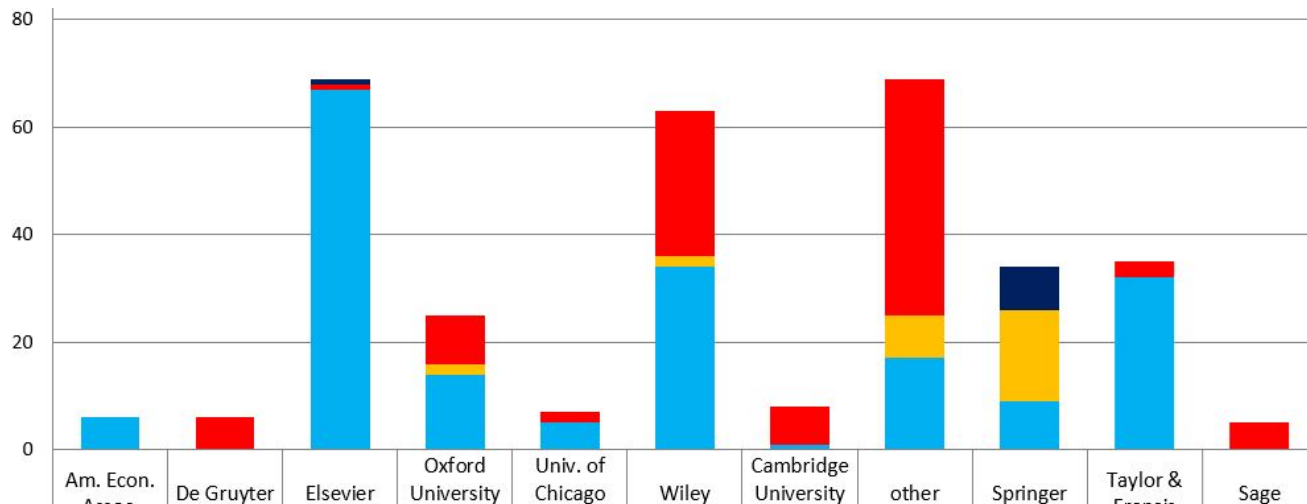
### 3. Number and Type of Journals' Data Policies (2019)



- More than 68% of all journals that publish empirical/'data-based' articles how have a data policy
- The majority uses DAPs
- ARPs and a combination of both policy types are less relevant
- Almost one-third of the journals do not yet have a policy.



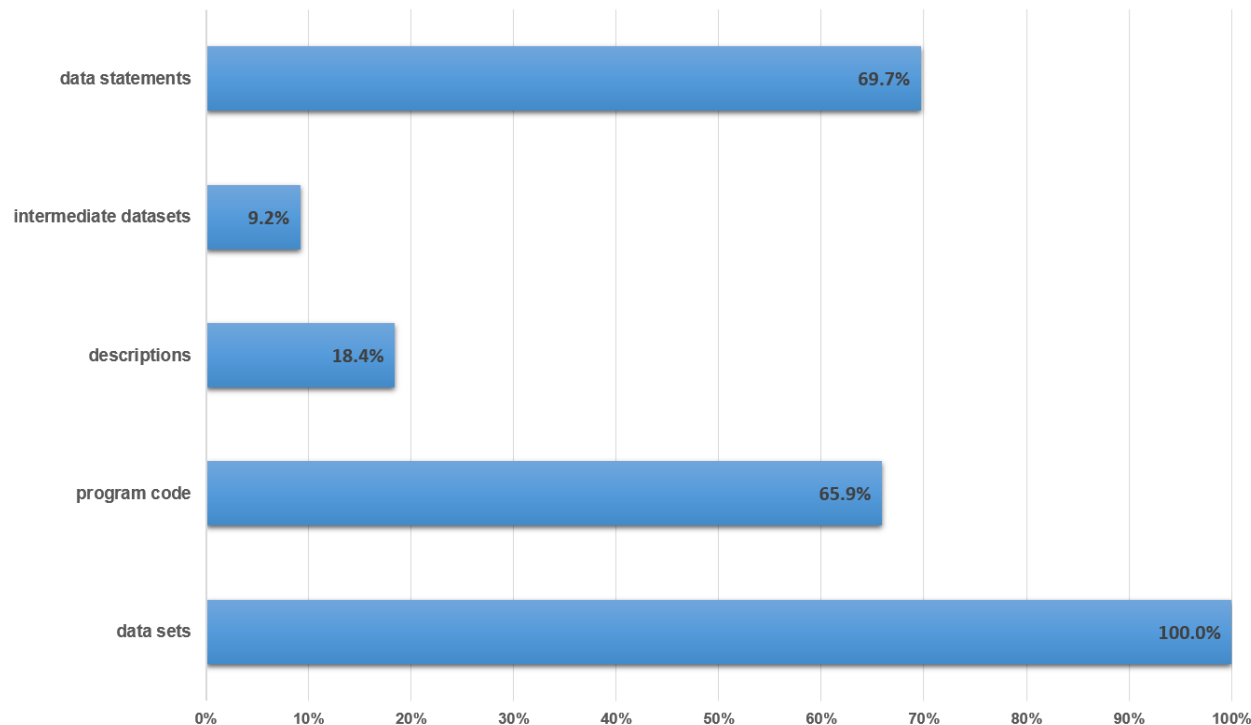
### 3. Types of Data Policies by Publishers (2019)



- Elsevier, T&F and the AEA with high rates of journals w. DAP
- Policies often identical for journals of one publisher.

### 3. Files and Information Requested

Requirements of Data Policies of Economics Journals  
(n=185 Data Availability Policies)



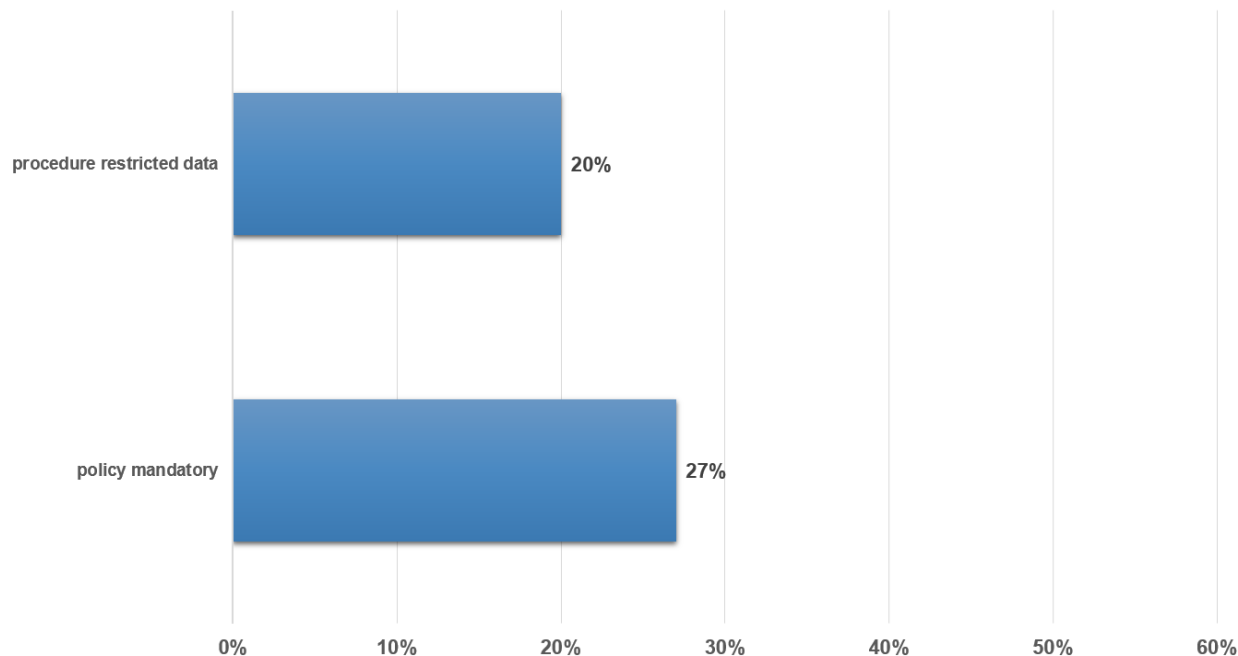
The study's findings suggest that not all data policies can be considered to ensure reproducibility.





### 3. The Case of Restricted Data

**The Share of mandatory Data Policies and  
Journals with a Procedure for Articles based on Restricted Data**  
(n=185 Data Availability Policies)



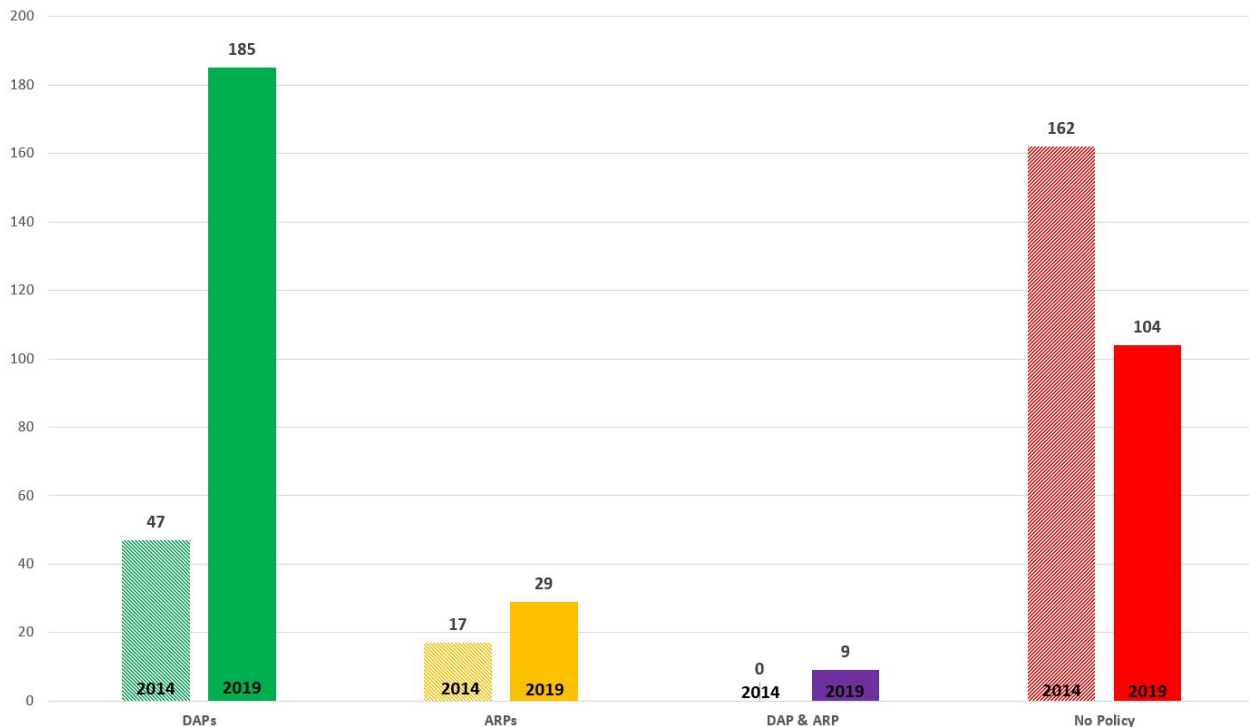
- Only 27% of all journals have a data policy that is mandatory for authors.
- A fifth of the journals have a procedure for research based on restricted data.



### 3. A Comparison between 2019 and 2014

Types of Data Policies used by Economic Journals in 2014 and 2019 in comparison

(absolute numbers | n=327 [2019] | n=262 [2014])



- In recent years, there has been a massive increase in journals' data policies.
- Publishers seem to be the drivers of this shift.
- BUT: The average quality of these policies has not improved. Many are voluntary, not very precise and are not subject specific.



## 4. Different Options for More Replications

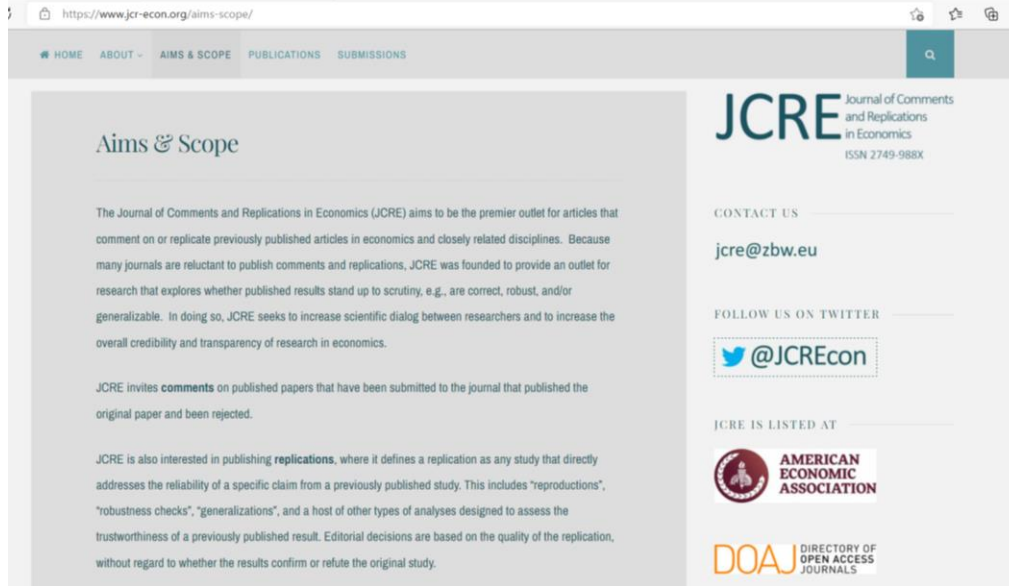
- Data archives along with strict data and code availability policies.
- Reproducibility check already at working paper series.
- Replication section in major journals that would publish replications that stay otherwise informal.
- Journal or website dedicated to comments and replications:
  - At ZBW, we have just relaunched The Journal of Comments and Replications in Economics (formerly IREE)
  - Institute for Replication (collaborative project that aims at generating replications). <https://i4replication.org/>

## 4. Different Options for More Replications

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- The Journal of Applied Econometrics has a replication section inviting also replications from articles in selected other journals.
- How to change incentives? Hard to tell.
- I think it has to come from publishers, influential institutions (AEA started), visible departments and established scholars changing their practices (e.g. publishing in JRCE).
- Doctoral thesis could include one replication paper on a mandatory basis.

# 4. The Journal of Comments and Replications in Economics



Submissions  
welcome !



Source: <https://www.jcr-econ.org/>

# Conclusion

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- Little replication in economics, but still more than one may think at first glance.
- The optimal amount of replication can be lower with high standards of reproducibility.
- Journal data policies are changing. Publishers have extended data policies, but in a very generic way.

# Conclusion

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- Established scholars are not just robots reacting to „incentives“. A number of them are using academic freedom to join new efforts for more replication.
- But more incentives will help and part of them have to come from the most visible departments, journals and professional institutions.