

Implementing Increased Transparency, and Reproducibility in Economics - The short version -

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The opinions expressed in this talk are solely the authors, and do not represent the views of the U.S. Census Bureau, the American Economic Association, or any of the funding agencies.



- Replication archives and Data (Code) Availability policies
 - Since 1985 in economics
 - More broadly since early 2000s





Results?



● 1986 ● 1986 ● 2006 ● 2006 ● 2015 ● 2016 ● 2017 ● 2018 ● 2018 ● 2018



In a nutshell

- **40%** use restricted-access data
- 25% use public-use data and are mostly or completely reproducible
- **25%** use public-use data and are only partially reproducible
- 10% fail to yield useful results





Second round (2012-)

•Greater <u>enforcement</u> of data (and code) availability

- 2015, AJ Political Science
- 2016, Data Editor for ASA Software Section
- 2016, Statistical review added Science
- 2017: AEA appoints Data Editor, with mandate to do similar activities (also EJ, Restud)



Action: Data citations and metadata

What is **FAIR**?

- Findable,
- •Accessible,
- Interoperable, and
- Re-usable



ABOUT - COMMUNITY - CODE OF CON FORCE11 » Groups » The FAIR Data Principles

THE FAIR DATA PRINCIPLES

JOIN IN THE DISCUSSION - LEA

FAIR Data Principles

Preamble

One of the grand challenges of data-intensiv



1. Importance

Data should be considered legitimate, citable products of research. Data should be accorded the same importance in the scholarly record as citat research objects, such as publications[1].



2. Credit and Attribution

Data citations should facilitate giving scholarly credit and normative and le attribution to all contributors to the data, recognizing that a single style or of attribution may not be applicable to all data[2].

3. Evidence

In scholarly literature, whenever and wherever a claim relies upon data, the corresponding data should be cited[3].

4. Unique Identification

A data citation should include a persistent method for identification that i actionable, globally unique, and widely used by a community[4].

5. Access

Data citations should facilitate access to the data themselves and to such

Data Citation Synthesis Group: Joint Declaration of Data Citation Principles. Martone M. (ed.) San Diego CA: FORCE11; 2014 [https://www.force11.org/group/joint-declaration-data-citationprinciples-final].



American Economic Review



The American Economic Review is a general-interest economics journal. Established in 1911, the AER is among the nation's oldest and most respected scholarly journals in economics.

American Economic Review: Insights

AER: Insights is designed to be a top-tier, general-interest economics _ journal publishing papers of the same quality and importance as those in the AER, but devoted to publishing papers with important insights that can be conveyed succinctly.

Journal of Economic Perspectives

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Journal of Economic Literature



The Journal of Economic Literature (JEL), first published in 1969, is designed to help economists keep abreast of and synthesize the vast flow of literature.

American Economic Journal: Applied Economics



American Economic Journal: Applied Economics publishes papers covering a range of topics in applied economics, with a focus on empirical microeconomic issues.

American Economic Journal: Macroeconomics



American Economic Journal: Macroeconomics focuses on studies of aggregate fluctuations and growth, and the role of policy in that context.

American Economic Journal: Microeconomics



Microeconomics publishes papers focusing on microeconomic theory; industrial organization; and the microeconomic aspects of

international trade, political economy, and finance.

The Journal of Economic Perspectives (JEP) fills the gap between the general interest press and academic economics journals.

American Economic Journal: Economic Policy



American Economic Journal: Economic

Policy publishes papers covering a range of topics, the common theme being the role of economic policy in economic outcomes.



Current efforts at the AEA

Pre-emptively improve code archives

- By conducting reproducibility checks when we can
- By working with groups that conduct reproducibility checks when we cannot

Better archives

- Greater transparency of the code and data archives
- Better provenance tracking
 - Leave code where it is when appropriate
 - Leave data where it is almost always
 - Display that information



AEA Pre-Publication Verification

- Every paper that receives a "conditional acceptance" is verified
 - Data citations
 - Quality of README
 - Quality of code
 - Reproducibility of code
 - Quality of metadata in the repository



Who is doing that?

- <u>Earlier reproducibility work</u>: Flavio Stanchi (now at AirBnb), Sylverie Herbert (on the market), Hautahi Kingi (Impaq)
- <u>Current lead graduate students</u>: David Wasser (until Dec 2019), Meredith Welch (since Jan 2020)
- <u>Current and past undergraduate students</u>: Alexia Ge, Anthony Peraza, Craig Schulman, Elijah B. Ruiz, Gabriel Bond, Jason S. Katz, Jeong Hyun Lee, Jiayin Song, John Park, Joshua Passel, Kirubeal T. Wondimu, Linchen Zhang, Louis Liu, Luis Lopez Cabrera, Luke O'Leary, Mary-Jo Ajiduah, Naomi Li, Nicholas Swan, Nishat Peuly, Ryan Ali, Samuel Frey, Siyang (Elaine) Yu, Steve Yeh, Weilun Shi, William Hernandez, Yanyun (Iris) Chen, Yuan-Hsuan (Sharon) Lin, Zebang Xu, Xing Su, Jiazhen Tan, Xueshi Su, Vendela Norman, Anderson Park, Nehedin Juarez, Rubal Mistry, Syon Verma, William Silverman, Zechariah Karsana
- Other graduate students: Aviv Caspi, Leah Kim

AEA Data and Code Guidance



Guidance for authors wishing to create data and code supplements, and for replicators.

Unofficial guidance on various topics by the AEA Data Editor

These web pages provide unofficial and developing guidance on the implementation of the American Economic Association (AEA)'s Data and Code Availability Policy. We also provide links to generic guidance being developed by a loose collective ("guild") of data editors and people in a similar role at various social science journals.

🏏 Follow @aeadata

Order in which AEA authors should read these resources:

- 1. Start with the official Data and Code Availability Policy
- 2. Look for general guidance at the Social Science Data Editors pages
- 3. Read the AEA's FAQ
- 4. Look for any guidance specific to the AEA at the **Unofficial AEA Data** and Code Guidance
- 5. Last but not least, have a look at the draft FAQ on this site

Comments are welcome, please file them as issues in our Github repo.

Guidance on creating replicable data and program archives

How should researchers create replicable data and program archives? How



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Full-featured repository



Depositing Data in the AEA Data and Code Repository

The American Economic Association journals require authors to deposit data and materials with a community-recognized or general repositories. The AEA Data and Code Repository at ICPSR serves that purpose. Please see the AEA's <u>Data and Code Availability Policy</u> and data citation guidance at the <u>Sample References</u> page for more details. **Authors are required to include a citation pointing to the deposit in the reference section of the final version of the article sent to the AEA.** The *openICPSR* repository automatically generates a citation when the data are "published."

Deposits should include all data, annotated program code, command files, and documentation that is needed to replicate the findings from the authors' submitted article.

- Data should be comprehensively documented (see ICPSR's Guide to Social Science Data Preparation and Archiving, 5th Edition for guidance). The author is responsible for removing identifying information from the data to protect confidentiality. Neither the AEA nor ICPSR review submissions for disclosure risk.
- Program code and command files should be annotated to facilitate replication and ensure clear correspondence between code and figures, tables, and analyses in the published article.
- Authors retain ownership and copyright to the data and code. Authors are required to affirm that they have the right to publish and redistribute the material. However,
 - ICPSR requires a license for distribution of data.
 - An **open license** is required by the AEA, in order to allow others to re-use the data and code, in particular for replication. Authors can select from several license options, including CC-BY 4.0 for data and Modified BSD for software and code. If an author would like to use multiple licenses or create a customized license, she should select the "Other" license option and upload a LICENSE file alongside the data and documentation.

By depositing in the AEA Data and Code Repository, the depositors allow the AEA staff to add keywords and other metadata which are important for proper indexing in linking. Any other changes are subject to the license chosen for the materials.

View more extensive (unofficial) guidance.

Start Your Deposit



Migrating archives

• Between Oct 11 and Oct 13, 2019, the staff at openICPSR ingested **2,552 historical AEA supplements**, increasing

the size of the openICPSR repository by a factor of 3.



Find Data / Imperial Russian Factory Database, 1894-1908 Imperial Russian Factory Database, 1894-1908 AMERICAN ECONOMIC ASSOCIATION Version: 😯 V1 File Type 🖸 Last Modified 🗠 Name 🖸 application/vnd.openxmlformats-× 4.5 officedocument.spreadsheetml.sheet MB 11:01:AM **Project Citation:** Gregg, Amanda. Imperial Russian Factory Database, 1894-1908. Nashville, TN: American Economic Association [publisher], 2020. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2020-01-29. https://doi.org/10.3886/E110681V1 text/x-stata-syntax KB AG_Corp_CleaningandDatabaseCompiler.do **Related Publications** The following publications are supplemented by the data in this project.

• Gregg, Amanda. "Factory Productivity and the Concession System of Incorporation in Late Imperial Russia, 1894-1908." American Economic Review 110, no. 2 (February 2020): 401–27. https://doi.org/10.1257/aer.20151656.

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... and findability relies on metadata

Google Imperial Russian Factory \times Q ▼ Usage Rights Updated Date Download Format Free 2 datasets found Middlebury Middlebury Imperial Russian Factory Database, 1894-1908 Imperial Russian Factory Database, 1894-1908 www.openicpsr.org www.da-ra.de Explore at openICPSR Self-Deposit Archive Explore at www.da-ra.de Updated Jan 29, 2020 Unique identifier https://doi.org/10.3886/E110681V1 Data from: Антиосманские 0 выступления болгар и русско-Dataset updated Jan 29, 2020 турецкие войны второй... explore.openaire.eu Dataset provided by Updated 24 нояб. 2015 г. Middlebury College Authors Amanda Gregg Not seeing a result you expected? Learn how you can add new License datasets to our index. Attribution 4.0 (CC BY 4.0) License information was derived automatically

Area covered

European Russia (Russian Empire)



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Every manuscript is checked

- What datasets are used
- Are they cited?
- Is there additional infor access?
 - \rightarrow URL leads to exact d
 - \rightarrow URL leads to applica
 - \rightarrow other access proced





Every manuscript is checked

- What datasets are used
- Are they cited?
- Is there additional information on access?
- Is there license/ data use information?
 - \rightarrow **Should** the author provide the data?
 - \rightarrow Is the author <u>allowed</u> to provide data?



Social science "guild"





Data and Code Guidance by Data Editors

Guidance for authors wishing to create data and code supplements, and for replicators.

Authors: Lars Vilhuber

This project is maintained by socialscience-data-editors

Disclaimer

Unofficial guidance on various topics by Social Science Data Editors

Guidance on creating replicable data and program archives

This guidance is for the author wanting to create a replication archive.

See Requested information for the information the Data Editor may request from you, prior to the acceptance of your paper for publication.

Guidance on testing replicability of code

This guidance has two audiences:

- the author wanting to verify whether her code passes muster as a replicable archive
- the replicator wanting to verify the replicability of such an archive

See Verification guidance

FAQ

See our growing FAQ. If you have questions or answers to add, please notify us by creating a new issue. <u>https://</u> <u>social-science</u> <u>-data-editors.</u> <u>github.io/</u> guidance/

Thank you!

DOI: to come

Extra slides



Evolving Journal and Data Infrastructure

Data Publishers struggle with this!

Exam	nple 1: O	ECD					
DED A.D.	\leftarrow \rightarrow C \textcircled{a}	D https://stats.oecd.org	/Index.aspx				
	ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT	D.Stat					
	Defluy theme Popular queries	1. Gross domestic	product (GDP) ⁰				
	Country Statistical Profiles	🕎 Customise 🝸 🔛 Exp	ort 🔻 🚺 Draw chart 🔻 🚨 M	Ay Queries 🔻			
	Gross domestic product (annual)	Please refer to the da	<mark>ataset</mark> Gross domestic pr	oduct (GDP), 2019 archive to	access longer time series based		
	ss domestic product (quarterly)	Please note that OEC	D reference year from 20	010 to 2015 changed on Tueso	day 3rd of December, 2019.		
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change!	de in Value Added (December						
	aith Status						
	our Market Statistics						
	Statistics (MEI)	→ Transaction					
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	use (ISIC4)	B1_GA: Gross domestic					
	Statistics from A to Z >> Data by theme	product (output approach)	B1G_P119: Gross value added at	B1G: Gross value added at basic price	es, total activity		
			basic prices, excluding FISIM	B1G: Gross value added at basic prices,	B1GVA: Agriculture, forestry and fishing (ISIC r		
				total activity	B1GVB_E: Industry, including energy (ISIC r		
					B1GVB_E: Industry, including B1GVC: of white energy (ISIC rev4) rev4)		
					B1GVF: Construction (ISIC rev4)		
					B1GVG_I: Distributive trade, repairs; transport;		
					(ISIC rev4) B1GVJ: Information and communication (ISIC r		
					B1GVK: Financial and insurance activities (ISIC		
					B1GVL: Real estate activities (ISIC rev4)		
					B1GVM_N: Prof., scientific, techn.; admin., sup rev4)		

Exam	ple 1: OEC	D						
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changel	our ~		→ Subject Employment rate, Aged 15-64, All persons ✓					~
	Earnings			→ Measure	Level, rate or qu	antity series, s.a.		
(but sometimes it does)	 Employment Protection Labour Force Statistics Annual Labour Force Statistics LFS by sex and age Short-Term Statistics 		✓ Quarterly					
			Unit					
				Q4-2016	Q1-2017	Q2-2017	C	
			→ Time		AV	AV	A 7	
	 Registered Unemployed and Job Vacancies 		→ı Country					
	Short-Term Labour Market		Australia 🕕	0	72.3	72.4	72.8	
	Statistics		Austria 🕕	0	71.7	71.8	72.2	
	Statistics - Employment Rates		Belgium 🕕	0	63.3	62.4	62.9	
	Active Population		Canada 🕦	0	72.9	73.3	73.4	
	Activity Rates		Chile 🕕	0	62.4	62.4	62.6	
	Employed Population		Czech Republic 🕕	0	72.7	73.1	73.3	
	Employment - by economic		Donmark A	•	rev4) 70 0	70.0	70.0	

Exam	ple 1: OE	\mathbf{C}	D							
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	Find in Themes >>> Reset		Customis	e 🔻 🐻 Export 👻 📳 Draw chart 💌	My Q	ueries 🔻				
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change!				→ı Me	asure	Level, rate or quar	itity series, s.a.			
(and then it doesn't)	 Employment Protection Labour Force Statistics Annual Labour Force Statistics LFS by sex and age Short-Term Statistics 				→ı Freqi	uency	Quarterly			
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	Short-Term Labour Market		Austria 🕕		0	249	245	242		
	Rates		Belgium 🕕		0	363	355	319		
	Active Population		Canada 🕕		0	1 275	1 215	1 185		
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			Denmark 🕕		0	174	177	160		
	Group		Estonia 🕕		0	48	38	38		
			Cipland A		-	rev4)	00.1	000		



Example 2: Academic data publisher



Home Methodology Media

Research & Applications About Us





Example 2: Academic data publisher







Example 2: Academic data publisher-new!



EPU Indic	es	Economic Policy Uncertainty Index
All Country	<u>/-Level Data</u>	We develop indices of economic policy uncertainty for countries around the world.
Global	<u>USA</u>	Monthly US Economic Policy Uncertainty Index
_		
Germany	DIS WORK IS LICE	ensed under a Creative Commons Attribution 4.0 International License
Hong Kong	India	150
<u>Ireland</u> Japan	<u>Italy</u> South Korea	

Response

Thanks, but I'll stick with what I've been doing for at least 20 years. At some point I might figure out the right license, but it's been working so far. And your inference is correct, the authors can use the data but not redistribute it. In this specific case, there is no reason for them to do so because the data are freely available to everyone.



Example 3: FRED (St. Louis Fed)

ECONOMIC DATA ST. LOUIS FED	ECONOMIC RESEARCH FEDERAL RESERVE BANK OF ST. LOUIS	MY ACCOUNT					
FRED _® Economic Dat	a Information Services Publications Working Papers Economists About	St. Louis Fed Home					
Categories > Prices > Consumer Price Indexes (CPI and PCE)							

Suggested Citation:

U.S. Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items in U.S. City Average [CPIAUCSL], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CPIAUCSL, February 3, 2020.





Example 4: German Restricted-access



RESEARCH DATA CENTRE (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB)

Home Newsletter John Contact Data Privacy Imprint

BHP 7518 v1 (current)

Data V	Version	DOI (Lir	nk to Description of Data Version	Availability ^{I)} dd)	(yyyy-mm-		
BHP	7518 v1 (current)	10.5164	/IAB.BHP7518.de.en.v1	2020-01-13			
BHP	7517 v1	10.5164	/IAB.BHP7517.de.en.v1	2018-12-12			
BHP	7516 v1	10.5164	/IAB.BHP7516.de.en.v1	2018-04-11			
		employees, both in total a	and broken down by gender, age, occupational status, gualit	ication and			
	Data Archive	nationality. Means and me	edians of wages for full-time employees are given, too. Add	onal datasets			
	Data Access	providing information abo	ut (gross) worker flows and about foundations and closures	of establishments	f establishments		
	Campus Files	are available on request.					
	Publications						
	Events	Data Versions		cases for new			
	Projects of FDZ users	Old versions are only ava	ilable for replication studies and only in justified exceptional				
	FDZ Projects	Projects.					
	Complaint point of the RatSWD	Data Version	Ava DOI (Link to Description of Data Version)	lability (yyyy-mm-			
	Figures of the FDZ		(, dd)				

0000 04 40



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		employees, both in total a	and broken down by gender, age, occupational status, gualit	ication and			
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	FDZ Projects	Projects.					
	Complaint point of the RatSWD	Data Version	Sion DOL (Link to Description of Data Version)				
	Figures of the FDZ		(, dd)				

0000 04 40



Example 4: German Restricted-access

Establishment History Panel (BHP) – Version 7518 v1

DOI: 10.5164/IAB.BHP7518.de.en.v1

Summary

Data source:

Data Access

The IAB Establishment Panel is available via the following ways of access:

On-site use at the FDZ. Further information on Applying for on-site use.

Remote data Access. Further information on Applying for remote data access.

nationality. Means and medians of wages for full-time employees are given, too. Additional datasets providing information about (gross) worker flows and about foundations and closures of establishments are available on request.

Dataset Descriptions and Frequencies

German

- DOI: 10.5164/IAB.FDZD.2001.de.v1
- FDZ-Datenreport 01/2020
- Fallzahlen und Labels

English

DOI: 10.5164/IAB.FDZD.2001.en.v1