



RICE UNIVERSITY
Fondren Library



Government Data Exploration

Case Study: How Government Fiscal Relief Affected
Employment in United States During 2020 Recession



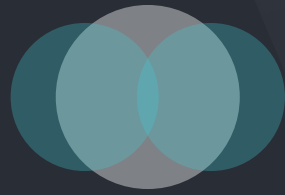
Anna Xiong: Government Information Coordinator, Fondren Library, Rice University

Nik Sun: Graduate Student, Master of Data Science, Rice University

FRED Biennial Conference: Beyond The Numbers, November 6-8, 2023

Outline

- Data Repository Project
 - Background
 - Objective
 - Overview
- Achievements
 - research opportunities for student
 - demo: study on relationship between fiscal policy and employment
 - clean data with case study stored in university database
 - reproductivity and reusability of data
- Future plans



DATA DRIVEN

Section 1

Background and

Objectives of Data

Repository Team Project

Background

[1] Fast growing interest of Data Science at Rice University

[2] Challenges:

[a] hard for beginners to get hands on government data (easily get lost)

[b] most well-suited datasets tend to be expensive, out of reach, or overused and outdated

[c] quality of open datasets varies widely

Collaboration as a Solution

1. Unmet Data Science instruction needs at Rice

2. Need new data repository for newly processed datasets

3. Need student friendly data sets

- free or low cost
- copyright free
- easy to find, easy to understand, easy to use
- data documentation

Proposed a collaborative project to address the needs through a collaboration among library, data science faculty, students



Objectives

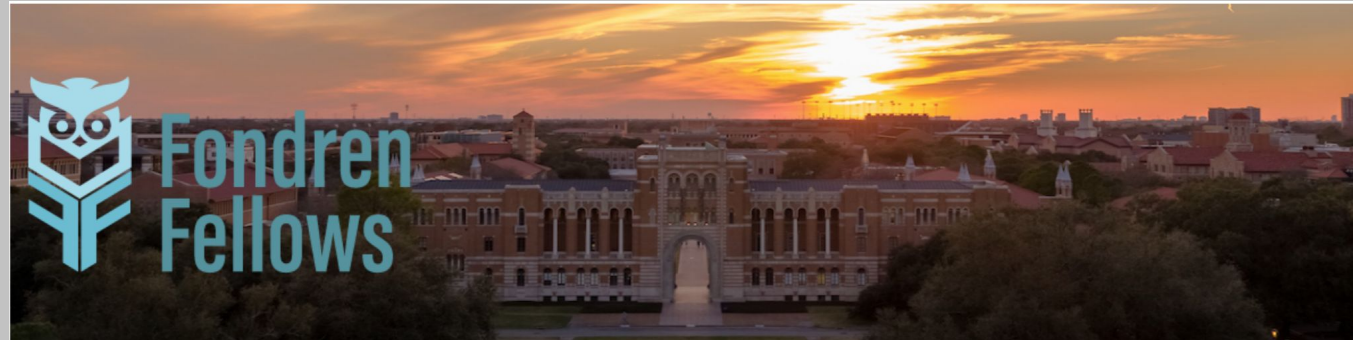
Student Research

1. Student can conduct research under professional guidance, utilizing government databases
2. Collaborate with other organizations to showcase research

Data Repository

1. Curated data with case study stored in university database
2. Reproductivity and reusability
 - a. course materials
 - b. workshop

Project Operation

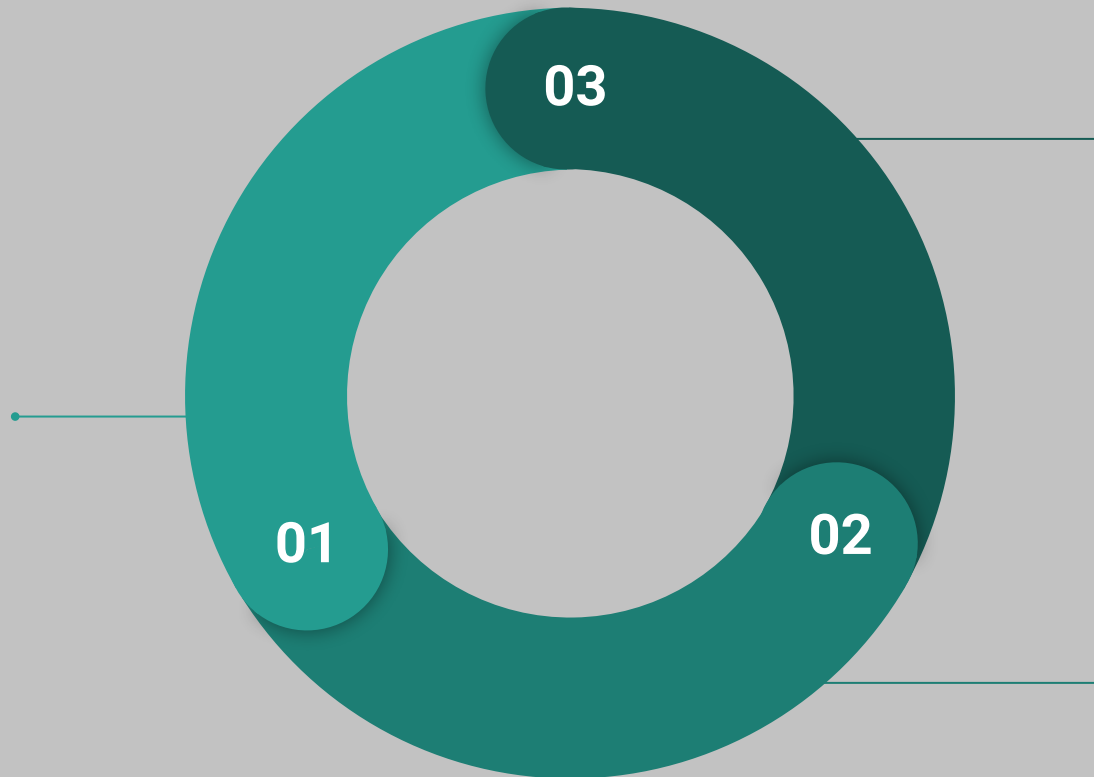


1. Sponsored by Fondren Fellows Fund for two semesters
 - a. hired three Rice students as Fellows
2. Mentor - Fellow
 - a. each Fellow was paired with a primary mentor
 - b. weekly primary mentor meeting
 - c. bi-weekly group meetings
3. Open government data only

Project Overview - 3 Stages

Fall Semester

- Discover research interest and suitable open government datasets;
- Deliverables: research questions, literature review, description of data



Early Summer

Mentors clean up and save into database

Spring Semester

- Data science pipeline, data wrangling, visualization, modeling;
- Deliverables: documentation, metadata, cleaned datasets, code files, study guide;
- Presenting at different places



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Section 2

Achievement 1 - Student Research



**Kelley Center for
Government Information,
Data, and Geospatial Services**

Key Partners:

- Rice Data Science Initiative
- Fondren Research Data Services



Fondren Library Data Repository for Data Science Education and Experiential Learning, Phase I [2022/23]



Mentors: [top row]
Catherine Barber, Data Services Specialist [left]
Anna Xiong, Government Information Coordinator [middle]
Su Chen, Data Science Assistant Teaching Professor/Director of Data Science Minor Program [right]

Fellows: [bottom row]
• Alison Qiu, Computer Science [left]
• Nik Sun: Master of Data Science [middle]
• Tina Li, Psychology (Statistics in fall) [right]

Team Achievements Summary

Data science research projects demonstrated how the datasets can be used:

1. Economics:

- Sun, N. and Xiong, A. How Government Fiscal Relief Affects Employment During 2020 Recession - Case Study of United States.

2. Education:

- Li, T. and Barber, C. Promoting Academic Success: The Influence of Demographics, Family, and County Diversity on Educational Outcomes in 12th Graders.

3. Health:

- Qiu, A. and Chen S. Data Analytics Approach to Addressing Children's Mental Health in the Post-Pandemic Era.

Case Study Demo:

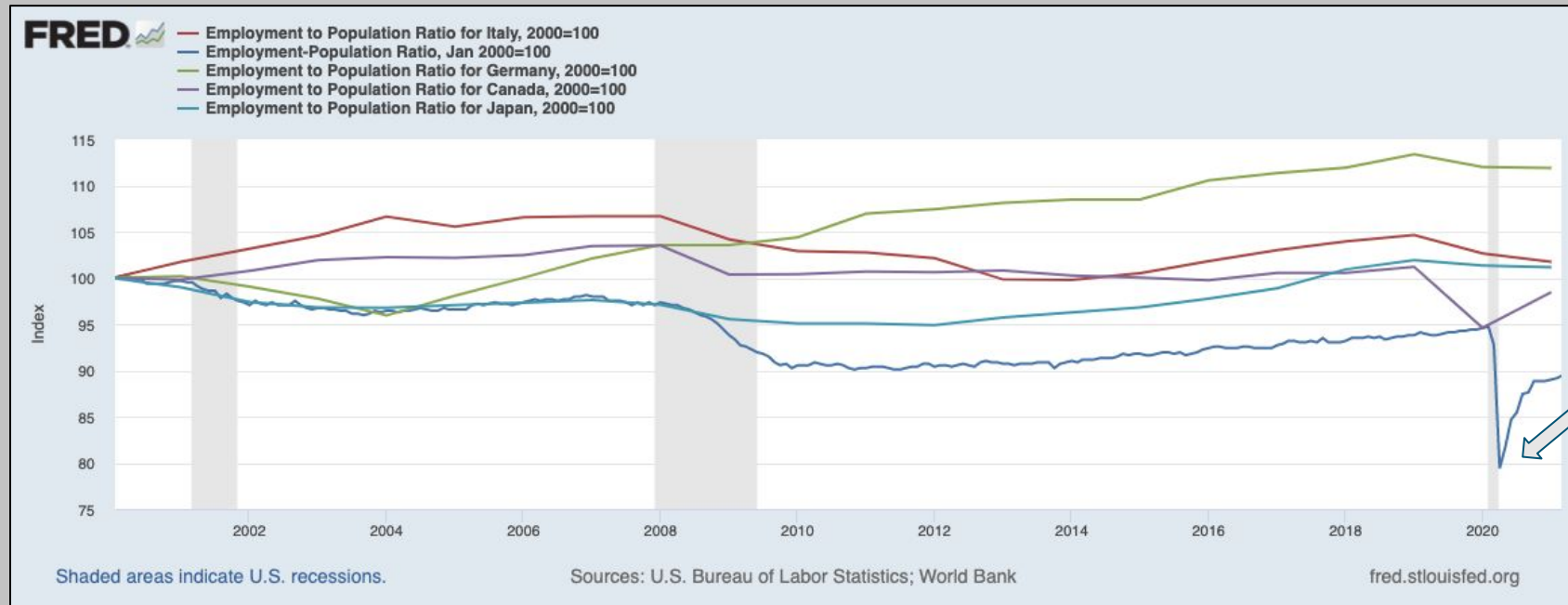
How Fiscal Relief Influences Employment

Pipeline



Background

Overall Employment-Population ratio of US and a few other developed countries, US monthly



(Organization for Economic Co-operation and Development: <https://fred.stlouisfed.org/series/LREM64TTUSM156S>)

Background

Does State Fiscal Relief during Recessions Increase Employment?
Evidence from the American Recovery and Reinvestment Act (ARRA)

(Chodorow-Reich, et al., 2012)

Data



Monthly Current Population
Survey, 2020-2021

age, gender, education,
and marital status, etc

Medicaid data



COVID-19 Fiscal Relief Disaster
Emergency Fund

Federal and
State Minimum
Wage Rates,
Annual

Annual GDP by
State

Data Wrangling

Monthly Current Population Survey (CPS)

- ❑ select variables of interest
- ❑ aggregate from individual to state level
 - ❑ from: whether an individual is employed
 - ❑ to: the employment rate (or many other estimations) of a state
 - ❑ customized estimations based on specific needs, such as unemployment rate for female, labor in union, etc, can be easily calculated via coding instructions

Merge with

- ❑ state level GDP, minimum wage, etc

Model, Result, and Conclusion

Model:

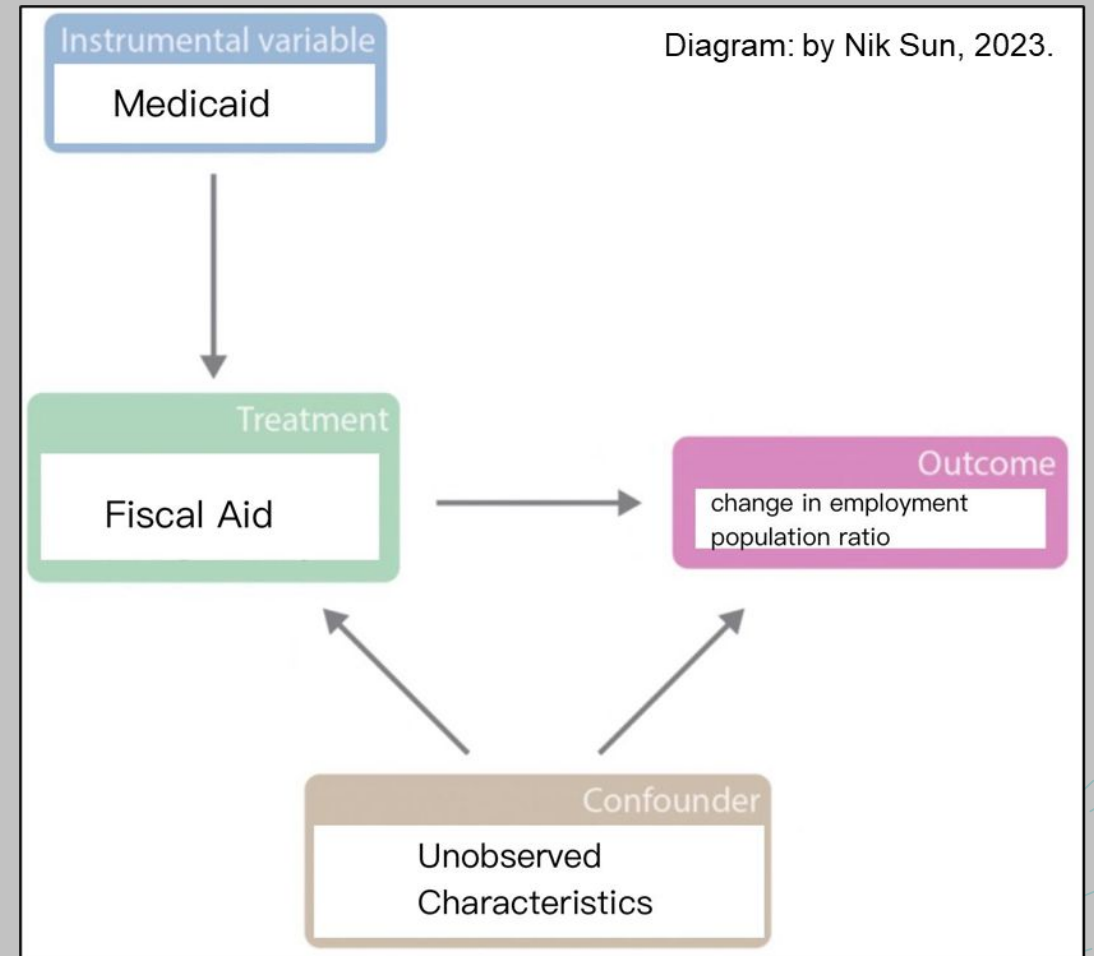
- 2-stage least square regression
- instrument: medicaid spending

Result:

- different from 2008
- statistically insignificant
- no evidence to show fiscal aid can help employment

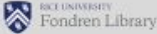
Conclusion:

- more rigid fiscal support
- pandemic policies makes the influence of fiscal relief measures on employment less predictable



Public Sharing


- Rice Data to Knowledge (D2K) Showcase Event (see pictures below).
- Rice Undergraduate Research Symposium Presentation





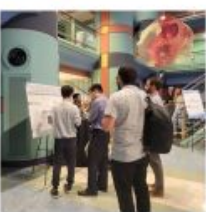
How Government Fiscal Relief Affects Employment During 2020 Recession - Case Study of United States



Fondren Library Data Repository for Data Science Education and Experiential Learning, Phase I

Nik Sun, Master of Data Science Anna Xiong, Government Information Coordinator / Fondren Library





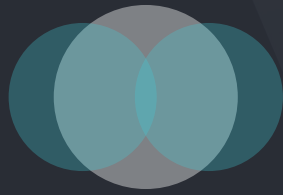



Credit for the poster

Sun, N. and Xiong, A. April 2023. How Government Fiscal Relief Affects Employment During 2020 Recession - Case Study of United States. Poster presentation. Rice D2K Showcase Event.

Photos and screen shot by Anna Xiong, except the photo (top right) of Nik Sun (Rice University Data Science student) and Anna Xiong was taken by an unknown event guest.



DATA DRIVEN

Section 3

Achievement 2 - Data Repository

Team Achievements Summary

Achievement 2: Data Repository - 9 Clean Data Sets

1. Census Bureau: Monthly Current Population Survey 2020 (PUMS) (April 23, 2020 - July 21, 2020)(January 4 - January 16, 2023)
2. Census Bureau: Monthly Current Population Survey 2020 (PUMS) (Jan 2020 - Dec 2020)
3. Census Bureau: Monthly Current Population Survey 2021 (PUMS)(Jan 2021 - Dec 2021)
4. USA Spending: COVID-19 Fiscal Relief Disaster Emergency Fund (On-going cumulative starting 2020)(Retrieved Jan 2023)
5. FRED: release table: Federal and State Minimum Wage Rates, Annual (2020-2022)
6. Bureau of Economic Analysis (BEA): Annual GDP by State (1997-2022 used for this project)
7. 2019 National Household Education Survey: Parent and Family Involvement in Education (January 16, 2019 - September, 2019)
8. 2018-2019 National Center for Education Statistics Common Core of Data (2018-2019)
9. Texas Education Agency: 2019 Four Year Graduation and Dropout Data (August 2015 - May 2019)

(Xiong, Chen, Barber, et al., 2023)


















Achievement 2: Data Repository - Landing Page

- Housed at [Rice Research Repository](#) (previous: Rice Digital Scholarship Archive) for
 - open access
 - learning
 - teaching
 - research
 - promotion
 - assessment
 - future collaboration

The screenshot shows the landing page of the Rice Scholarship Home. The browser address bar displays 'scholarship.rice.edu'. The page features the Rice University logo and the text 'RICE Digital Scholarship Archive'. Navigation links for 'FAQ', 'Deposit your work', and 'Login' are visible. The main heading reads 'Welcome to Rice University's digital scholarship archive'. Below this, a paragraph describes the repository as a site for sharing, managing, searching, and preserving intellectual output. A link to the FAQ is provided. The page is organized into a grid of six categories, each with a white icon on a blue background: 'Faculty & Staff Research' (microscope), 'Rice Theses & Dissertations' (books), 'University Archives & Rice History' (building), 'Publications & Performances' (musical notes), 'Graduate & Undergraduate Student Research' (graduation cap), and 'Cultural Heritage Collections' (globe). On the right side, there is a 'Searching scope' section with a search bar and a 'BROWSE' section with a list of categories: 'Entire Archive', 'Communities & Collections', 'By Issue Date', 'Authors', 'Titles', 'Subjects', and 'Type'. Below this is a 'MY ACCOUNT' section with a 'Login' button and a 'STATISTICS' section with a 'View Usage Statistics' button.

Achievement 2: Data Repository Continued

- <https://repository.rice.edu/bitstreams/40cc036a-b30b-4bd4-9d8c-01e19ee2dfdb/download>
- Student friendly data documentation and instruction for learning and teaching
- Clean government economics datasets ready for students and other researchers to reuse

3_economics_employment_project.zip 17 items		
Name	Last modified	File size
 3_001_cps_data_dictionary.csv	May 30, 2023	34 KB
 3_002_cps_2020_data.csv	May 26, 2023	201 MB
 3_003_cps_2021_data.csv	May 26, 2023	200 MB
 3_004_cps_cleaning.ipynb	May 26, 2023	218 KB
 3_005_cps_aggregate_data_dictionary.csv	May 30, 2023	889 bytes
 3_006_cps_2020_aggregate_data.csv	May 26, 2023	94 KB
 3_007_cps_2021_aggregate_data.csv	May 26, 2023	95 KB
 3_008_cps_aggregation.ipynb	May 26, 2023	43 KB
 3_009_financial_data_dictionary.csv	May 30, 2023	1 KB
 3_010_covid_aid_data.csv	May 26, 2023	2 KB
 3_011_medicaid_data.csv	May 26, 2023	4 KB
 3_012_gdp_data.csv	May 26, 2023	447 MB
 3_013_minwage_data.csv	May 26, 2023	7 KB
 3_014_financial_cleaning.ipynb	May 26, 2023	56 KB
 3_015_case_study_data.csv	May 26, 2023	308 KB
 3_016_case_study_learning_guide.ipynb	May 26, 2023	3 MB
 3_readme_economics_employment_project.txt	May 26, 2023	5 KB

Achievement 2: Data Repository: Continued

<https://doi.org/10.25611/7YE1-A689>

Name
3_economics_employment_project.zip
1_mental_health_project.zip
2_education_demographics_project.zip
readme_open_data_repository_project.txt

Two additional projects:

This readme file was generated on 2023-05-31 by Catherine Barber

GENERAL INFORMATION

Title of Dataset: Fondren Library Data Repository for Data Science Education and Experiential Learning

Author Information

Name: Anna Xiong
Institution: Rice University
Email: jax2@rice.edu

Author Information

Name: Su Chen
Institution: Rice University
Email: scl31@rice.edu

Author Information

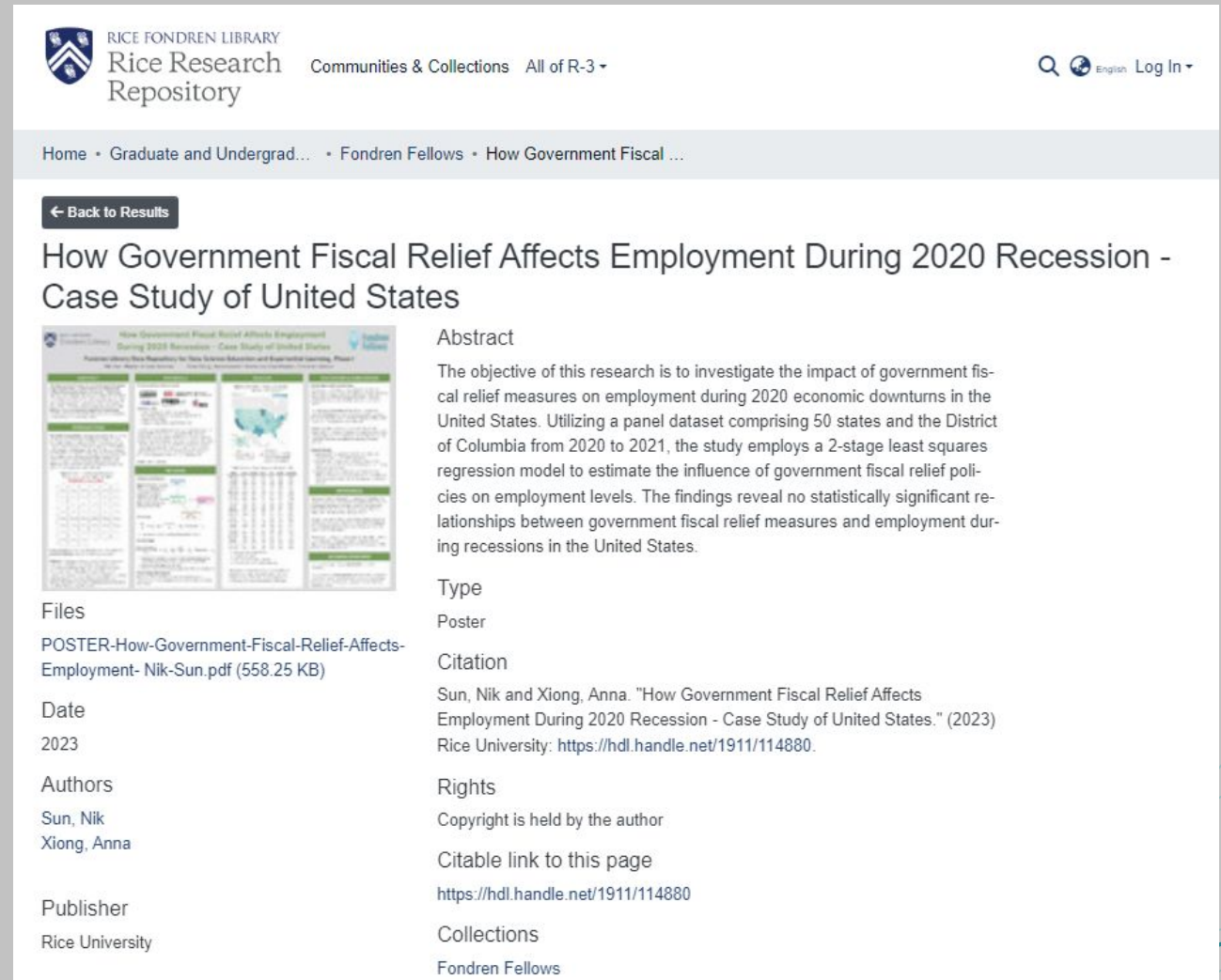
Name: Catherine R. Barber
ORCID: 0000000289039125
Institution: Rice University
Email: cb88@rice.edu

Name	Last modified	File size
3_001_cps_data_dictionary.csv	May 30, 2023	34 KB
3_002_cps_2020_data.csv	May 26, 2023	201 MB
3_003_cps_2021_data.csv	May 26, 2023	200 MB
3_004_cps_cleaning.ipynb	May 26, 2023	218 KB
3_005_cps_aggregate_data_dictionary.csv	May 30, 2023	889 bytes
3_006_cps_2020_aggregate_data.csv	May 26, 2023	94 KB
3_007_cps_2021_aggregate_data.csv	May 26, 2023	95 KB
3_008_cps_aggregation.ipynb	May 26, 2023	43 KB
3_009_financial_data_dictionary.csv	May 30, 2023	1 KB
3_010_covid_aid_data.csv	May 26, 2023	2 KB
3_011_medicaid_data.csv	May 26, 2023	4 KB
3_012_gdp_data.csv	May 26, 2023	447 MB
3_013_minwage_data.csv	May 26, 2023	7 KB
3_014_financial_cleaning.ipynb	May 26, 2023	56 KB
3_015_case_study_data.csv	May 26, 2023	308 KB
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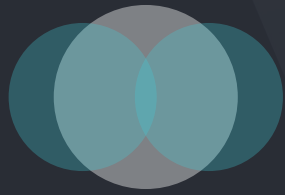
Achievement 2: Data Repository: Continued

Poster was archived too:

Sun, Nik and Xiong, Anna. "How Government Fiscal Relief Affects Employment During 2020 Recession - Case Study of United States." (2023) Rice University:
<https://hdl.handle.net/1911/114880>



The screenshot shows the Rice Research Repository interface. At the top, it features the Rice Fondren Library logo and navigation links for 'Communities & Collections' and 'All of R-3'. A search bar and 'Log In' option are also present. Below the navigation, a breadcrumb trail reads 'Home • Graduate and Undergrad... • Fondren Fellows • How Government Fiscal ...'. A 'Back to Results' button is visible. The main title of the record is 'How Government Fiscal Relief Affects Employment During 2020 Recession - Case Study of United States'. To the left of the abstract is a thumbnail image of the poster, which includes a map of the United States and various data visualizations. The abstract text states: 'The objective of this research is to investigate the impact of government fiscal relief measures on employment during 2020 economic downturns in the United States. Utilizing a panel dataset comprising 50 states and the District of Columbia from 2020 to 2021, the study employs a 2-stage least squares regression model to estimate the influence of government fiscal relief policies on employment levels. The findings reveal no statistically significant relationships between government fiscal relief measures and employment during recessions in the United States.' Below the abstract, the 'Type' is listed as 'Poster'. The 'Citation' section provides the full citation: 'Sun, Nik and Xiong, Anna. "How Government Fiscal Relief Affects Employment During 2020 Recession - Case Study of United States." (2023) Rice University: <https://hdl.handle.net/1911/114880>.' The 'Rights' section indicates 'Copyright is held by the author'. A 'Citable link to this page' is provided as <https://hdl.handle.net/1911/114880>. The 'Collections' section lists 'Fondren Fellows'. On the left side of the page, there are sections for 'Files' (listing 'POSTER-How-Government-Fiscal-Relief-Affects-Employment- Nik-Sun.pdf (558.25 KB)'), 'Date' (2023), 'Authors' (Sun, Nik; Xiong, Anna), and 'Publisher' (Rice University).



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Section 4

Achievement 3 -

Reusability

Achievement 3: Usage

For students and beginning researchers:

01	Data	<ul style="list-style-type: none">● clean, ready-to-use, up-to-date, beginner-friendly● on fields of economics, health, education
02	Code	<ul style="list-style-type: none">● easy-to-follow study guide provided● learn about steps, codes, factors to consider for wrangling datasets
03	Case Study	<ul style="list-style-type: none">● practice of statistics and machine learning● motivate applications to new project

Achievement 3: Usage - Continued

For faculty, instructors, librarians, etc:

01	Research	<ul style="list-style-type: none">● share the processed datasets, study guides, repositories as reference resources for students● use it by themselves
02	Teaching	<ul style="list-style-type: none">● replace extensively used datasets in class● integrate into courses of various subjects
03	Workshop	<ul style="list-style-type: none">● about software or open government data sources● for college students or programs of high school STEM camps

Achievement 3: Currently Used

- Software workshop
 - Rice Data Carpentry Bootcamp
 - Fondren Library Data@Rice training workshops
- Data Science 101 at Rice University
- History class at Rice University



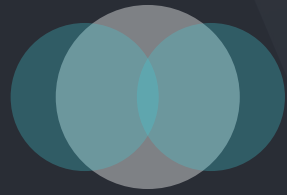
DSCI 101 001 (CRN: 23620)

INTRO TO DATA SCIENCE

Long Title: INTRODUCTION TO DATA SCIENCE

Department: Data Science

Instructor: Chen, Su



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Section 5

Future Plans

Future Plans

A. This Repository

- Keep using it
- Outresearch and Promotion
 - Chinese American Library Associations
 - ACRL Open Science Cookbook
 - FRED - Beyond the Numbers
- Assessment
- Additional datasets

Future Plans

B. Scan other current government data services at my library

- Conduct individual research involving government data
- Initiate or participate in collaborative research involving government data, like this team project

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Library / LibGuides / Data Resources / Home

Data Resources: Home

This guide provides links to data resources on a wide variety of topics and administrative levels (international, national, state, county, and local).

Home Specialty Topics Fondren Databases/Data/Statistics Texas Research Data Center Government Data Tools Other Rice Data Sources Tutorials

Sample Datasets

Government Information Coordinator

Welcome

Welcome to this research guide on Data Sources!

This research guide is created and maintained by Kelley Center for Government Information, Data, and Geospatial Services.

Any comments, questions, need assistance, request a training, suggesting a training topic, please use the contact information on this page or email govhelp@rice.edu.

Guide Scope

This guide provides links to data resources on a wide variety of topics and administrative levels (international, national, state, county, and local). The content ranges from government, commercial/library subscribed databases, and reputable data organizations.

Use the tabs on top to navigate through the content of this research guide.

Types of Data Sources

- free
 - government - federal, state, city, county, international, foreign countries ...
 - some intergovernmental organizations such as World Bank, WHO, WTO, EuroStats

Fondren LibGuide: Data Sources
And
Library reference assistance to support

Home Special Topics Fondren Databases/Data/Statistics Texas Research Data Center Government Data Tools

Sample Datasets

Tutorials and Support

Click here to browse and use the tutorials we have collected for you.

Government Data Tools (by Federal Agencies)

- [Data Analysis Tools/Agency for Health Research and Quality](#)
- [Bureau of Economics Analysis - Tools](#)
- [Access Data Tools / Bureau of Health Workforce](#)
- [Data Analysis Tools / BJS](#)
- [Data Tools / BLS](#)
- [Data and Tools / EPA](#)
- [Water Data and Tools / EPA](#)
- [Crime Data Explorer / FBI](#)
- [Online Tools / Data and Statistics / CDC](#)
- [Data Tools for Economics Research / FRED](#)

Library Web Page
Government Data Tools

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Library / LibGuides / Fondren Data Visualization Short Course Showcase / Find and Prepare Data

Fondren Data Visualization Short Course Showcase

Home Find and Prepare Data Data Analysis Tools

Course Slides - Introduction Part

- [Course Slides-Finding Data Section](#)

Sample Class Data Sets

Source Credit

All original data sets used for this short course come from U.S. Census Bureau. They are selected and provided by Kelley Center for Government Information, Data, and Geospatial Services.

Questions or need assistance with finding, accessing and using this or additional data sources:

Anna Xiong, Government Information Coordinator and Sociology Library Liaison
axiong@rice.edu or govhelp@rice.edu, 713.548.6212, Basement B38A, Fondren Library

- [original shapefile](#)
When you open the web page, choose Texas as state to download the shapefiles for mapping in ArcGIS or Tableau. You need to download the file for the whole state. The size is large. Use the FIPS code 48021 to filter for Harris County. (Use County code 201 to filter for Harris County in Tableau).
Used for ArcGIS and Tableau
- [data.census.gov](#)
- [data set 1 \(Excel file\)](#)
Excel file for ACS 2016-2020 5-Year Estimates Data for Harris County at the tract level. It includes median earnings, total and % population by gender.
Used for Excel section.
- [data set 2 \(Excel\)](#)
Excel file for ACS 2016-2020 5-Year Estimates Data for Harris County at the tract level. It includes total and % population by race.

Fondren Course Guide
Fondren Data Visualization Short
Course Showcase

All Short Courses

Displaying 1 - 7 of 7

Event Type

Course Topic

- Any -

Apply

- [Analyzing and Visualizing Census Data with R](#) Wed, Oct 18 2023, 2:30 - 4pm *Published*
- [Exploring and Mapping Census Data Using R / Choroplethr - Basics](#) Wed, Oct 25 2023, 3 - 4:30pm *Published*
- [Introduction to Government Data and Statistics Resources](#) Thu, Oct 5 2023, 11am - 12pm *Published*
- [Legal Research: Introduction to Congress.gov and GovTrack.us](#) *Published*
- [Legal Research: Introduction to Westlaw and HeinOnline](#) *Published*
- [Navigating World Bank Data Resources and Beyond](#) Wed, Sep 27 2023, 11am - 12pm *Published*
- [Navigating World Bank Data Resources and Beyond](#) Thu, Sep 28 2023, 2 - 3pm *Published*

Library Instruction
Government Data Training Series

Future Plans: Continue

Improve the quality and increase the quantity

- continuous education
- user experience test
- new connection, inspiration, collaboration

Reference

- Chodorow-Reich, Gabriel, Feiveson, Laura, Liscow, Zachary and Woolston, William Gui . "[Does State Fiscal Relief during Recessions Increase Employment? Evidence from the American Recovery and Reinvestment Act \(ARRA\)](#)." (2012) American Economic Journal: Economic Policy, 4 (3): 118-45.
- Fondren Library. Rice Research Repository. (2023) <https://repository.rice.edu/home>
- Organization for Economic Co-operation and Development, Employment Rate: Aged 15-64: All Persons for United States [LREM64TTUSM156S], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/LREM64TTUSM156S>, October 31, 2023
- Sun, Nik. "3_economics_employment_project.zip" in "Fondren Library Data Repository for Data Science Education and Experiential Learning." Rice Research Repository. (2023) <https://repository.rice.edu/bitstreams/40cc036a-b30b-4bd4-9d8c-01e19ee2dfdb/download>
- Sun, Nik and Xiong, Anna. "How Government Fiscal Relief Affects Employment During 2020 Recession - Case Study of United States." (2023) Rice University: <https://hdl.handle.net/1911/114880>.

Reference: Continued

- Xiong, Anna. (2023) [Government Data Tools - Data Resources - LibGuides at Rice University](#)
- Xiong, Anna, Barber, Catherine R, Zhao, Jane, and Ricker, Kim. (2023) [Home - Fondren Data Visualization Short Course Showcase - LibGuides at Rice University](#)
- Xiong, Anna. (2023) [Home - Data Resources - LibGuides at Rice University](#)
- Xiong, Anna, Chen, Su, Barber, Catherine R., et al.. "Fondren Library Data Repository for Data Science Education and Experiential Learning." (2023) Rice University:
<https://doi.org/10.25611/7YE1-A689>.

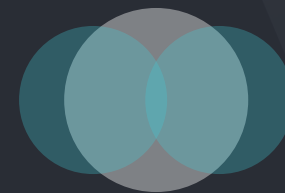


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THE END! THANK YOU!

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Science, Rice University, xs23@rice.edu



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