

ECONGU4325: Problem Set 4

Due: 10am EST on Monday, November 9, 2020 on gradescope

Instructions:

This problem set asks you to analyze Japanese labor force data from the Basic Survey on Wage Structure, available publicly from the Ministry of Health, Labor and Welfare. The questions are designed to let you practice working with multiple data sets and searching secondary sources for supporting information as you begin writing your empirical term paper.

- *If you work on the questions out of order, you will need to complete Parts A through C in Question 1 before working on Question 2. Otherwise you can work on the questions in any order.*
- *Submit your work spreadsheet with data from Q1 Parts A through C and Q2 Parts A and B separately from your problem set write-up.*
- *The data in the spreadsheet does not need to be formatted in any particular way, but it should be clear and easy to tell which data correspond to which question. Make sure that column headings and row titles do not get cut off.*
- *Include all graphs in your main problem set write-up. You can leave any graphs in the Excel spreadsheet, but for grading purposes please include the graphs in your problem set write-up with the rest of your answers.*
- *For all graphs, make sure that all variables, time series, and axes are clearly labeled as needed, and all of your graphs have titles. When graphing multiple time series on the same graph, use either different colors or types of lines to distinguish between the variables. For more notes, you can refer to the “Tips for Making Effective Graphs” on Canvas.*
- *Your problem set write-up should be in a proper word document (as if you were submitting a proper report on the analyzed data). Please do not submit a write-up that was done in Excel or a similar spreadsheet program.*
- *If you handwrite your answers, please write legibly.*
- *Points will be deducted for poor presentation of visuals and illegible answers.*

Question 1 – Recent trends in tenure

For this question, we are interested in analyzing trends in the average number of years that a worker has been at their current place of employment (aka “**tenure**”). More specifically, we will be analyzing how a worker’s level of education and gender affect tenure in Japan. We will also compare tenure trends in Japan to those in the United States.

- A. For your analysis, start by downloading the Basic Survey on Wage Structure data.
 - i. Go to the Statistics and Other Data page on the Ministry of Health, Labor and Welfare (MHLW) website:
<http://www.mhlw.go.jp/english/database/report.html>
 - ii. Click on “Labour Statistics”.
 - iii. Under “Wages”, click “Basic Survey of Wage Structure”.
 - iv. Under “Statistical Table”, click on “Ordinary Workers Data”. This will bring you to a webpage with downloadable Excel files for 1999 through 2018. For this question, you will only be working with data from 2000 to 2018.

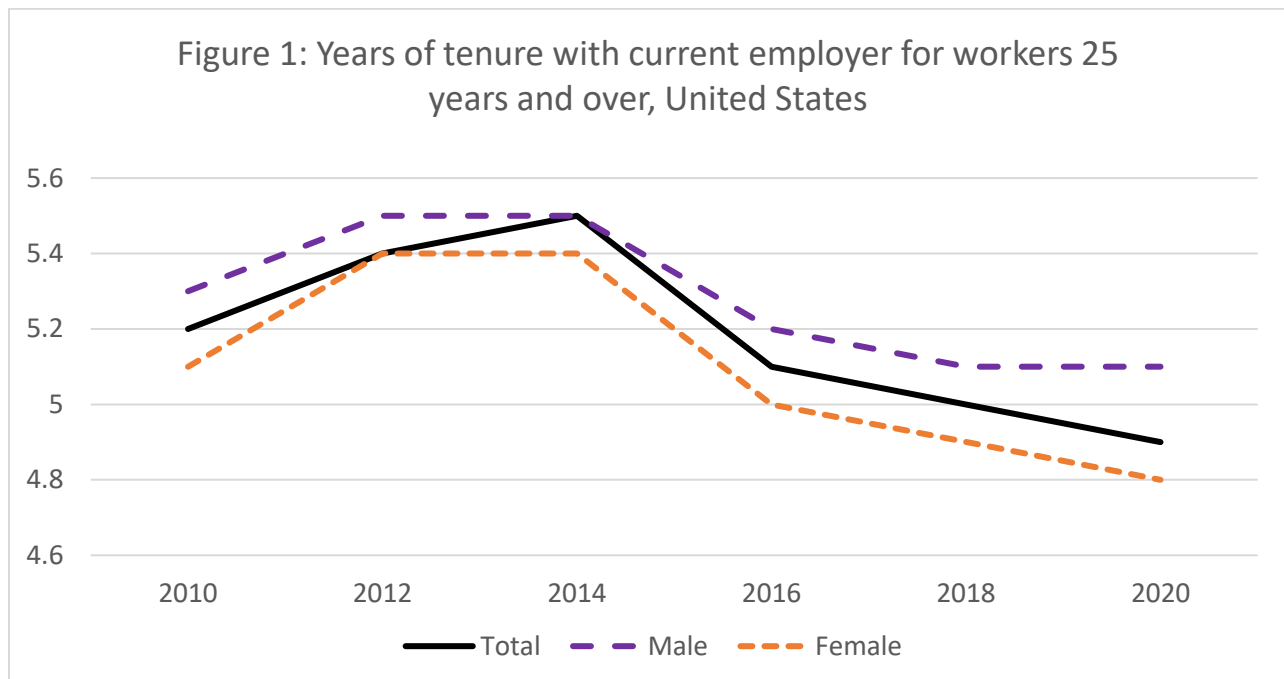
- B. Create a new work Excel file (**you will be submitting this spreadsheet with your problem set write-up**) where you will save select data from the raw data files for Q1 and Q2. (25 points total for all data)

- C. For this question, we are interested in the **length of service** (this is the variable for tenure) for workers at all sizes of enterprises in all industries (“industries covered”).
 - i. To find data from 2000 to 2006, use data in the Excel file under “Industries covered”.
 - ii. For years from 2007 onward, use the data under the “**industries covered**” **tab [T]** in the single Excel file provided for the year.

For each year, retrieve length of service data for workers in all age groups combined in the following education and gender groups (you should end up with 6 time series, 19 data points in each):

- i. All workers in all school careers and graduates of universities.
 - ii. Male workers in all school careers and graduates of universities.
 - iii. Female workers in all school careers and graduates of universities.
- D. Create 2 graphs using the time series that you have collected. Put years on the x-axis and length of service on the y-axis. Plot the time series for all workers (both education groups) on one graph, and time series for male and female workers (both education groups) on the second graph. Make sure to adjust the axes as needed. (20 points)

- E. Describe and compare the trends that you observe for all workers in the two education groups (all school careers and graduates of universities). You should comment on the general trend and any notable changes in tenure over this period, but you do not need to describe every single dip and rise in length of service. Are there any differences in trends between workers in the two education groups over this time period? How does the average tenure that you observe compare to the empirical evidence on Japanese worker tenure you saw presented in the Week 8 lecture slides on Japanese labor markets? (10 points)
- F. Describe and compare the trends that you observe for male and female workers in the two education groups (all school careers and graduates of universities). Once again, you should comment on the general trend and any notable changes in tenure over this time period, but you do not need to describe every single dip and rise in length of service. What differences do you observe between male and female workers, within each education group and between groups? What are some potential reasons we observe these trends in the data? (10 points)
- G. The following is a time series graph of length of service for all, male, and female workers 25 years and older, in all education groups combined (equivalent to “all school careers” in the Japanese data), in the United States from 2010 to 2020. Compare worker tenure in the United States and in Japan over this time period. Then, citing evidence from the Week 8 lectures, provide some possible explanations for any similarities and/or differences that you observe between the two countries. (10 points)



Source: Bureau of Labor Statistics, “Employee Tenure in 2020”.

Notes: Data is collected every two years and is reported in January of each data year.

Question 2 – Gender differences in lifetime annual earning profiles

For this question, we are interested in seeing how annual salaries differ over a worker's lifetime for men and women in Japan, both in the economy overall and in a specific industry. You will focus on data from the 2018 Basic Survey on Wage Structure only.

- A. Copy to your work spreadsheet the data series on **contractual cash earnings** (this is the variable for annual salary) for all male and female workers in the different age groups (19 and younger, 20-24, etc.) who are graduates of universities employed at all sizes of enterprises in all industries (from the Industries Covered [T] tab).
- B. Select **one** of the four following industries, each with its own tab:
[E] Manufacturing
[F] Electricity, gas, heat supply, and water
[M] Accommodations, eating, and drinking services
[P] Medical, health care and welfare

Copy to your work spreadsheet data on **contractual cash earnings** for male and female workers in the different age groups (19 and younger, 20-24, etc.) who are graduates of universities in that industry at enterprises of all sizes.

- C. Create a single graph using the contractual earnings data from Part A. Plot age groups on the x-axis and earnings on the y-axis. (10 points)
- D. In the graph from Part C, what trends do you observe for men vs. women? Why might we observe these trends in the data? Provide empirical evidence from your readings and/or lecture materials. For the purposes of this question, you may assume that age is a proxy for tenure at a firm, if necessary. (10 points)
- E. Create a single graph using the contractual earnings data from Part B. Plot age groups on the x-axis and earnings on the y-axis. (10 points)
- F. What trends do you observe for men vs. women in the graph from Part E? How do these trends compare to what you observe in the data for graduates in All Industries in Part C? What are some potential explanations for any differences that you observe (*note: you do not need to cite any readings for this part*)? (10 points)

Don't forget to submit your work spreadsheet after you complete Questions 1 and 2!

References:

1. Bureau of Labor Statistics. "Employee Tenure in 2020". September 22, 2020. Accessed October 26, 2020. <https://www.bls.gov/news.release/pdf/tenure.Pdf>