CPS in Japan

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Contents

Chapter 1

Summary

- Use the Labor force survey, which is open-access and includes similar variables as the current population survey in U.S.

Chapter 2

Simple description: Long-run

- Describe labor market after 1969.

2.1 Environment

```
library(data.table)
library(tidytable)
library(tidyverse)
library(lubridate)
```

2.2 Data

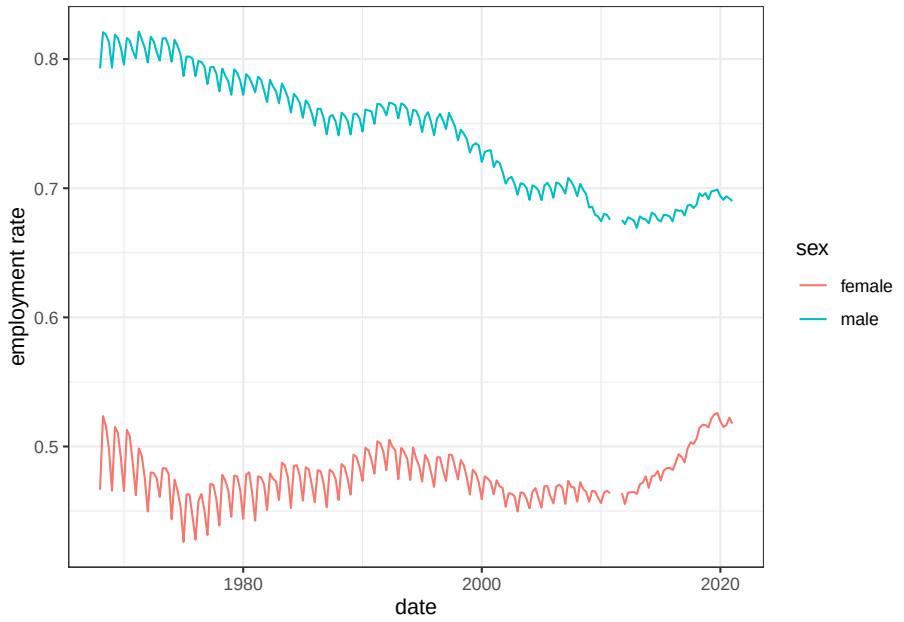
```
raw <-
  read_csv("data/aggregate_time_series.csv") %>%
  mutate(date = ymd(date),
         year = year(date),
         month = month(date),
         quaterly = if_else(month >= 1 & month <= 3, 1, 0),
         quaterly = if_else(month >= 4 & month <= 6, 2, quaterly),
         quaterly = if_else(month >= 7 & month <= 9, 3, quaterly),
         quaterly = if_else(month >= 10 & month <= 12, 4, quaterly),
         employment = as.numeric( ),
```

```
        population = as.numeric(`15   `),
        sex = if_else(  == " ", "male", "female")
        ) %>%
  select(date,year:sex) %>%
  arrange(sex,year,quaterly) %>%
  group_by(sex,year,quaterly) %>%
  mutate(employment = sum(employment),
        population = sum(population)
        ) %>%
  ungroup %>%
  mutate(employment_rate = employment/population) %>%
  filter(month == 1 |
           month == 4 |
           month == 7 |
           month == 10)
```

2.3 Employment rate

- Report $e_{g,m,y} = \frac{Employment_{g,m,y}}{Population_{g,m,y}}$, where $Employment_{g,m,y}$ and $Population_{g,m,y}$ are numbers of employment and population over 15 years old in month m, year y and gender group g, respectively.

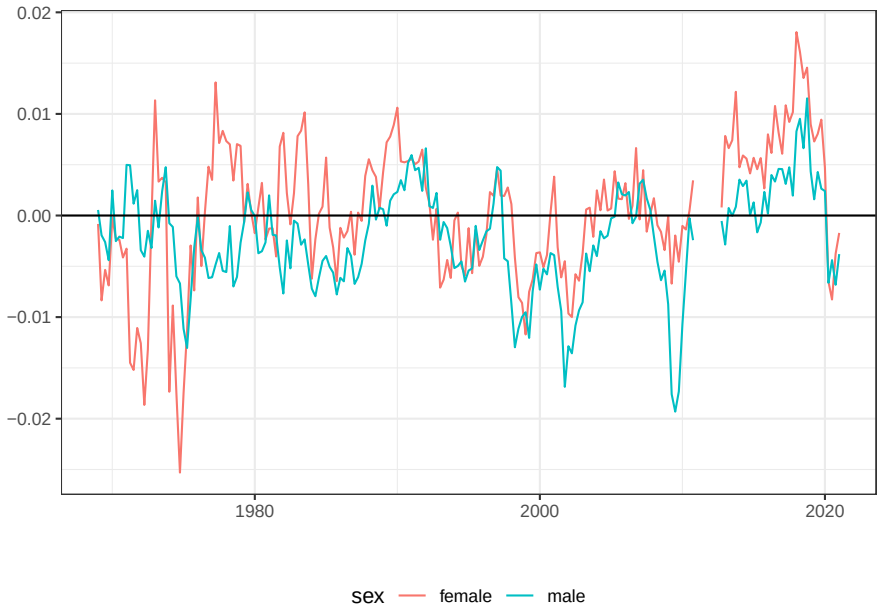
```
raw %>%
  mutate(y = employment_rate) %>%
  ggplot(aes(x = date,
             y = y,
             color = sex)
         ) +
  geom_line() +
  theme_bw() +
  ylab("employment rate")
```



2.4 Year-to-year difference of employment rate

- Report change of employment rate $\tilde{e}_{g,m,y} = e_{g,m,y} - e_{g,m,y-1}$

```
raw %>%
  arrange(sex,
          quaterly,
          year) %>%
  group_by(sex,
           quaterly) %>%
  mutate(y = employment_rate - lag(employment_rate)) %>%
  ungroup %>%
  filter(year >= 1969) %>%
  ggplot(aes(x = date,
             y = y,
             color = sex)
         ) +
  geom_line() +
  geom_hline(yintercept = 0) +
  ylab("") +
  xlab("") +
  theme_bw() +
  theme(legend.position = "bottom")
```

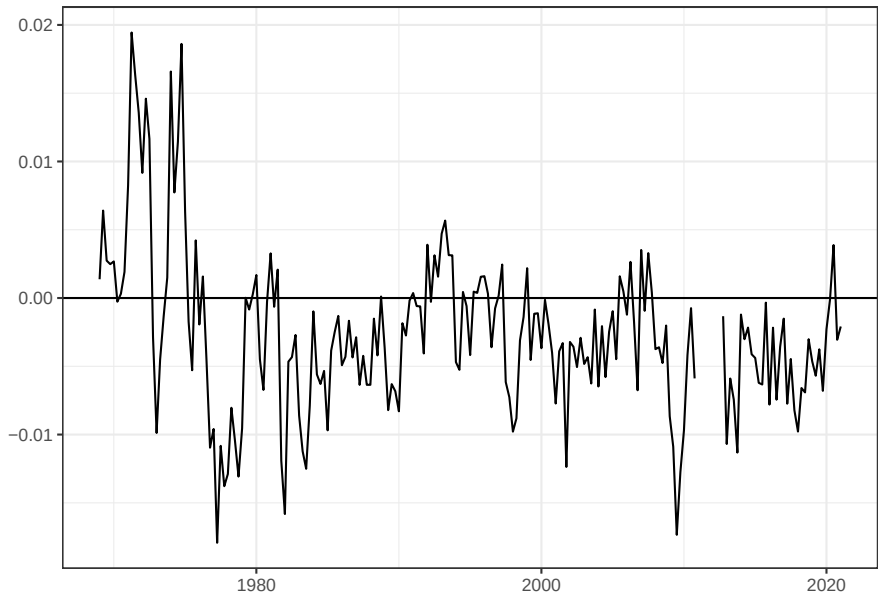


2.5 Gender gap

- Report change of employment rate $\tilde{e}_{male,m,y} - \tilde{e}_{female,m,y}$

```
raw %>%
  arrange(sex,
          quaterly,
          year) %>%
  group_by(sex,
           quaterly) %>%
  mutate(y = employment_rate - lag(employment_rate)) %>%
  ungroup %>%
  filter(year >= 1969) %>%
  arrange(date,
          sex) %>%
  group_by(date) %>%
  mutate(y = y - lag(y)) %>%
  ungroup %>%
  filter(sex == "male") %>%
  ggplot(aes(x = date,
             y = y)
         ) +
  geom_line() +
```

```
  geom_hline(yintercept = 0) +
  ylab("") +
  xlab("") +
  theme_bw()
```



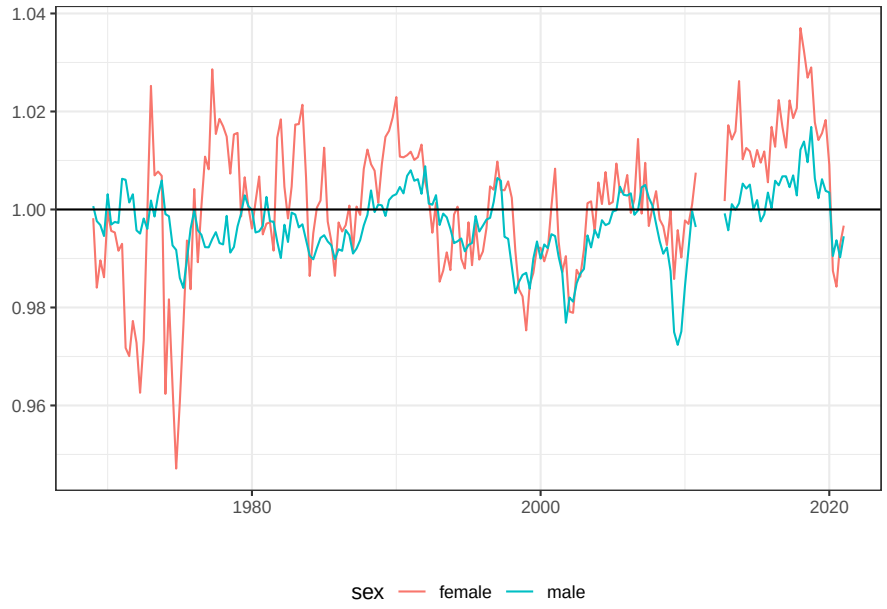
Chapter 3

Alternative mesuare

3.1 Year-to-year difference of employment rate

- Report change of employment rate $\tilde{e}_{g,m,y} = \frac{e_{g,m,y}}{e_{g,m,y-1}}$

```
raw %>%
  arrange(sex,
          quaterly,
          year) %>%
  group_by(sex,
           quaterly) %>%
  mutate(y = employment_rate/lag(employment_rate)) %>%
  ungroup %>%
  filter(year >= 1969) %>%
  ggplot(aes(x = date,
             y = y,
             color = sex)
         ) +
  geom_line() +
  geom_hline(yintercept = 1) +
  ylab("") +
  xlab("") +
  theme_bw() +
  theme(legend.position = "bottom")
```


1.04
1.02
1.00
0.98
0.96
1980
2000
2020
sex
female
male

Chapter 4

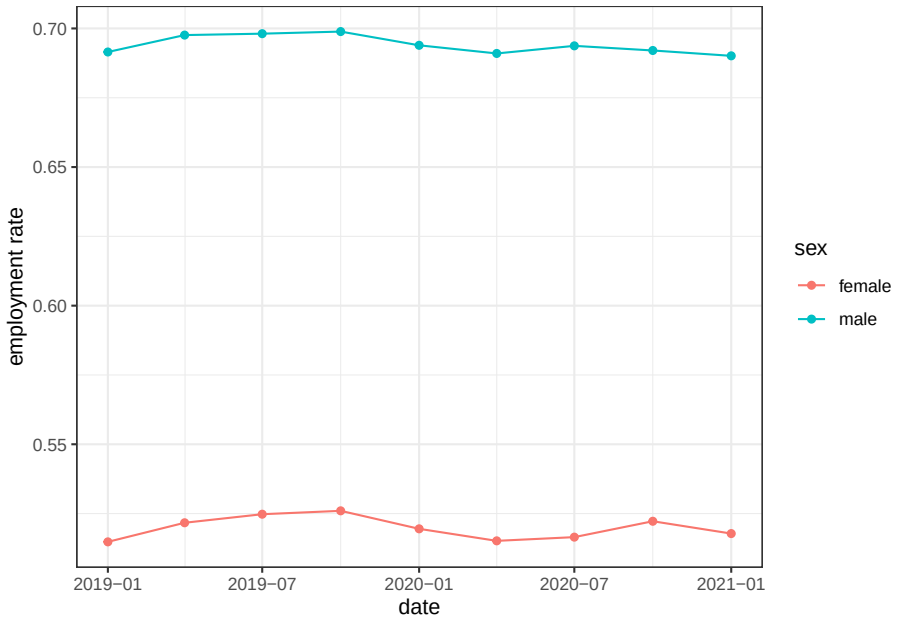
Simple description

- Describe labor market after 2019.

4.1 Employment rate

- Report $e_{g,m,y} = \frac{Employment_{g,m,y}}{Population_{g,m,y}}$, where $Employment_{g,m,y}$ and $Population_{g,m,y}$ are numbers of employment and population over 15 years old in month m, year y and gender group g, respectively.

```
raw  %>%
  filter(year >= 2019) %>%
  mutate(y = employment_rate) %>%
  ggplot(aes(x = date,
             y = y,
             color = sex)
         ) +
  geom_line() +
  geom_point() +
  theme_bw() +
  ylab("employment rate")
```

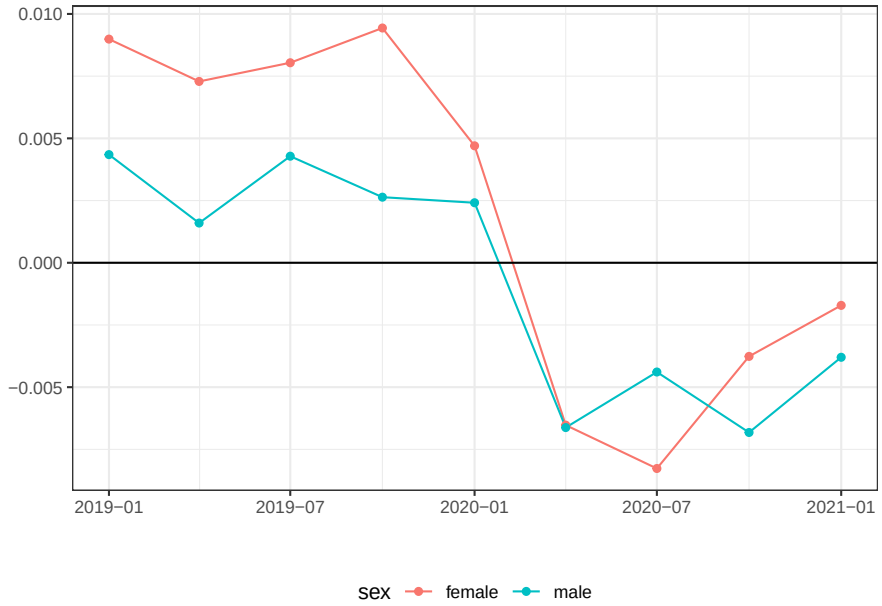


4.2 Year-to-year difference of employment rate

- Report change of employment rate $\tilde{e}_{g,m,y} = e_{g,m,y} - e_{g,m,y-1}$

```
raw %>%
  arrange(sex,
          quaterly,
          year) %>%
  group_by(sex,
           quaterly) %>%
  mutate(y = employment_rate - lag(employment_rate)) %>%
  ungroup %>%
  filter(year >= 2019) %>%
  ggplot(aes(x = date,
             y = y,
             color = sex)
         ) +
  geom_line() +
  geom_point() +
  geom_hline(yintercept = 0) +
  ylab("") +
  xlab("") +
```

```
  theme_bw() +
  theme(legend.position = "bottom")
```



4.3 Gender gap

- Report change of employment rate $\tilde{e}_{male,m,y} - \tilde{e}_{female,m,y}$

```
raw %>%
  arrange(sex,
          quaterly,
          year) %>%
  group_by(sex,
           quaterly) %>%
  mutate(y = employment_rate - lag(employment_rate)) %>%
  ungroup %>%
  filter(year >= 1969) %>%
  arrange(date,
          sex) %>%
  group_by(date) %>%
  mutate(y = y - lag(y)) %>%
  ungroup %>%
  filter(sex == "male") %>%
```

```
  filter(year >= 2019) %>%
  ggplot(aes(x = date,
             y = y)
         ) +
  geom_line() +
  geom_point() +
  geom_hline(yintercept = 0) +
  ylab("") +
  xlab("") +
  theme_bw()
```