BLS - CEW - Example

Datasets

François Geerolf

Contents

Preamble

```
rm(list = ls())
pklist <- c("curl", "tidyverse", "rvest")
source("https://fgeerolf.github.io/datasets/load-packages.R")
options(tibble.print_max = 100)
```

Introduction

Sources for CEX

The data for the CEX is available here: https://www.bls.gov/cex/
The flat data files of the CEX are: https://download.bls.gov/pub/time.series/cx/

Item		2013	2014	2015	Percent change	
					2013 - 2014	2014 - 2015
Average income before taxes		$63,784	$66,877	$69,629	4.8	4.1
Average annual expenditures		51,100	53,495	55,978	4.7	4.6
Food	..	6,602	6,759	7,023	2.4	3.9
Food at home	..	3,977	3,971	4,015	-0.2	1.1
Food away from home	...	2,625	2,787	3,008	6.2	7.9
Housing	.	17,148	17,798	18,409	3.8	3.4
Shelter	...	10,080	10,491	10,742	4.1	2.4
Utilities		3,737	3,921	3,885	4.9	-.9
Household furnishings and equipment		1,542	1,581	1,818	2.5	15.0
Apparel and services	..	1,604	1,786	1,846	11.3	3.4
Transportation	..	9,004	9,073	9,503	0.8	4.7
Vehicle purchases	..	3,271	3,301	3,997	0.9	21.1
Gasoline and motor oil		2,611	2,468	2,090	-5.5	-15.3
Healthcare		3,631	4,290	4,342	n/a	1.2
Health insurance	.	2,229	2,868	2,977	n/a	3.8
Entertainment	...	2,482	2,728	2,842	9.9	4.2
Education	..	1,138	1,236	1,315	8.6	6.4
Cash contributions	..	1,834	1,788	1,819	-2.5	1.7
Personal insurance and pensions		5,528	5,726	6,349	3.6	10.9
Life and other personal insurance	..	319	327	333	2.5	1.8
Pensions and Social Security	..	5,209	5,399	6,016	3.6	11.4
All other expenditures	.	2,129	2,311	2,530	8.5	9.5

[1] Subcategories do not sum to 100%.
n/a: Because of a questionnaire change, the 2013-14 change was not strictly comparable to previous years.

Figure 1: Overall Budget Shares

Overall Budget

Load Datasets

```
load("cx.series.RData")
load("cx.data.1.AllData.RData")
```

Examples

Gasoline

Gasoline was about $2611 per year, which is about `{r} =2600/51100*100` or 5% of consumption

These series appear to start only in 1984.

Gasoline, other fuels, and motor oil by Income Range: $5,000 to $9,999 before tax income Gasoline, other fuels, and motor oil by Income Quintiles: Lowest 20 percent income quintile Gasoline, other fuels, and motor oil by Census Region: Region of residence: northeast

Fro example, list Gasoline: item_code = "GASOIL"

by income range: demographics_code = "LB02"

```
cx.series %>%
  filter(item_code == "GASOIL",
         demographics_code == "LB02") %>%
  select(series_id, series_title) %>%
  as.tibble
```

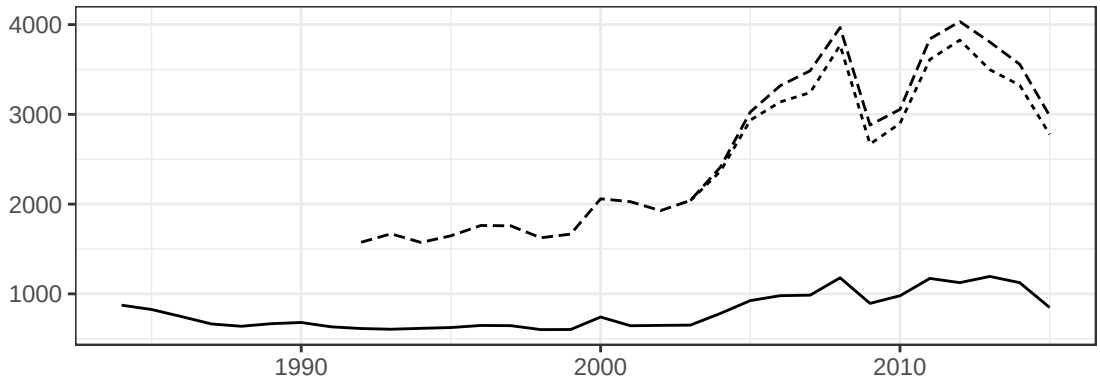
```
## # A tibble: 25 x 2
##    series_id               series_title
##    <fct>                   <fct>
##  1 "CXUGASOILLB0201M     ~ Gasoline, other fuels, and motor oil by Income~
##  2 "CXUGASOILLB0202M     ~ Gasoline, other fuels, and motor oil by Income~
##  3 "CXUGASOILLB0203M     ~ Gasoline, other fuels, and motor oil by Income~
##  4 "CXUGASOILLB0204M     ~ Gasoline, other fuels, and motor oil by Income~
##  5 "CXUGASOILLB0205M     ~ Gasoline, other fuels, and motor oil by Income~
##  6 "CXUGASOILLB0206M     ~ Gasoline, other fuels, and motor oil by Income~
##  7 "CXUGASOILLB0207M     ~ Gasoline, other fuels, and motor oil by Income~
##  8 "CXUGASOILLB0208M     ~ Gasoline, other fuels, and motor oil by Income~
##  9 "CXUGASOILLB0209M     ~ Gasoline, other fuels, and motor oil by Income~
## 10 "CXUGASOILLB0210M     ~ Gasoline, other fuels, and motor oil by Income~
## 11 "CXUGASOILLB0211M     ~ Gasoline, other fuels, and motor oil by Income~
## 12 "CXUGASOILLB0212M     ~ Gasoline, other fuels, and motor oil by Income~
## 13 "CXUGASOILLB0213M     ~ Gasoline, other fuels, and motor oil by Income~
## 14 "CXUGASOILLB0214M     ~ Gasoline, other fuels, and motor oil by Income~
## 15 "CXUGASOILLB0215M     ~ Gasoline, other fuels, and motor oil by Income~
## 16 "CXUGASOILLB0216M     ~ Gasoline, other fuels, and motor oil by Income~
## 17 "CXUGASOILLB0217M     ~ Gasoline, other fuels, and motor oil by Income~
## 18 "CXUGASOILLB0218M     ~ Gasoline, other fuels, and motor oil by Income~
## 19 "CXUGASOILLB0219M     ~ Gasoline, other fuels, and motor oil by Income~
## 20 "CXUGASOILLB0220M     ~ Gasoline, other fuels, and motor oil by Income~
## 21 "CXUGASOILLB0221M     ~ Gasoline, other fuels, and motor oil by Income~
## 22 "CXUGASOILLB0222M     ~ Gasoline, other fuels, and motor oil by Income~
```

```
## 23 "CXUGASOILLB0223M     ~ Gasoline, other fuels, and motor oil by Income~
## 24 "CXUGASOILLB02A1M     ~ Gasoline, other fuels, and motor oil by Income~
## 25 "CXUGASOILLB02A2M     ~ Gasoline, other fuels, and motor oil by Income~
```

```
data <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
              filter(item_code == "GASOIL",
                     demographics_code == "LB02") %>%
               select(series_id, series_title),
            by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year) %>%
  as.tibble
```

Plot during the Oil Price Boom

```
data %>%
  filter(series_id %in% c("CXUGASOILLB0204M", "CXUGASOILLB0210M", "CXUGASOILLB0213M")) %>%
  ggplot(aes(x = year, y = value, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Property Taxes

List series

```
cx.series %>%
  filter(item_code == "220211",
         subcategory_code == "HOUSING",
         demographics_code == "LB02") %>%
  select(series_id, series_title) %>%
  as.tibble
```

```
## # A tibble: 25 x 2
```

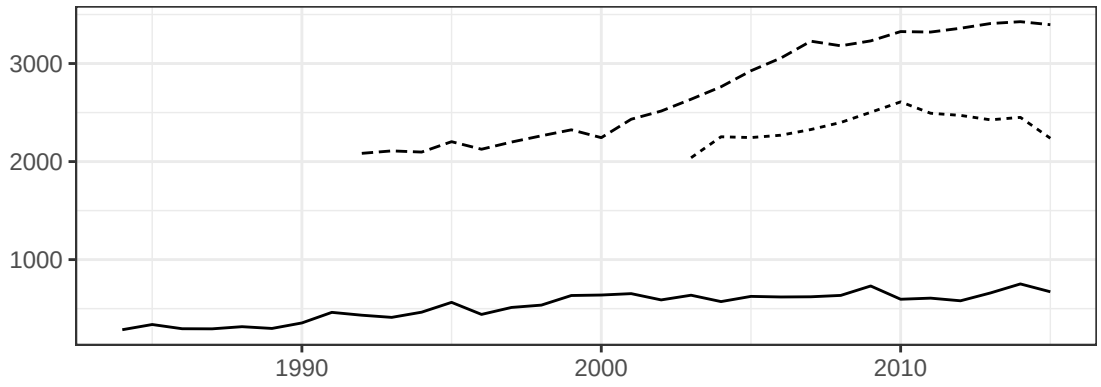
```
##    series_id               series_title
##    <fct>                   <fct>
##  1 "CXU220211LB0201M     ~ Property taxes by Income Range: All Consumer U~
##  2 "CXU220211LB0202M     ~ Property taxes by Income Range: Before tax inc~
##  3 "CXU220211LB0203M     ~ Property taxes by Income Range: $5,000 to $9,9~
##  4 "CXU220211LB0204M     ~ Property taxes by Income Range: $10,000 to $14~
##  5 "CXU220211LB0205M     ~ Property taxes by Income Range: $15,000 to $19~
##  6 "CXU220211LB0206M     ~ Property taxes by Income Range: $20,000 to $29~
##  7 "CXU220211LB0207M     ~ Property taxes by Income Range: $30,000 to $39~
##  8 "CXU220211LB0208M     ~ Property taxes by Income Range: $40,000 to $49~
##  9 "CXU220211LB0209M     ~ Property taxes by Income Range: $50,000 to $69~
## 10 "CXU220211LB0210M     ~ Property taxes by Income Range: Before tax inc~
## 11 "CXU220211LB0211M     ~ Property taxes by Income Range: Before tax inc~
## 12 "CXU220211LB0212M     ~ Property taxes by Income Range: $70,000 to $79~
## 13 "CXU220211LB0213M     ~ Property taxes by Income Range: $80,000 to $99~
## 14 "CXU220211LB0214M     ~ Property taxes by Income Range: Before tax inc~
## 15 "CXU220211LB0215M     ~ Property taxes by Income Range: $100,000 to $1~
## 16 "CXU220211LB0216M     ~ Property taxes by Income Range: $120,000 to $1~
## 17 "CXU220211LB0217M     ~ Property taxes by Income Range: Before tax inc~
## 18 "CXU220211LB0218M     ~ Property taxes by Income Range: Less than $15,~
## 19 "CXU220211LB0219M     ~ Property taxes by Income Range: $15,000 to $29~
## 20 "CXU220211LB0220M     ~ Property taxes by Income Range: $70,000 to $99~
## 21 "CXU220211LB0221M     ~ Property taxes by Income Range: $100,000 to $1~
## 22 "CXU220211LB0222M     ~ Property taxes by Income Range: $150,000 to $1~
## 23 "CXU220211LB0223M     ~ Property taxes by Income Range: $200,000 and m~
## 24 "CXU220211LB02A1M     ~ Property taxes by Income Range: Before tax inc~
## 25 "CXU220211LB02A2M     ~ Property taxes by Income Range: Total complete~
```

Prepare Data

```
data <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
              filter(item_code == "220211",
                     subcategory_code == "HOUSING",
                     demographics_code == "LB02") %>%
               select(series_id, series_title),
             by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year)
```

Plot of Property Taxes

```
data %>%
  filter(series_id %in% c("CXU220211LB0204M", "CXU220211LB0210M", "CXU220211LB0213M")) %>%
  ggplot(aes(x = year, y = value, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Food Away From Home

List series

```
cx.series %>%
  filter(subcategory_code == "FOODTOTL",
         item_code == "FOODAWAY",
         demographics_code == "LB02") %>%
  select(series_id, series_title) %>%
  as.tibble
```

```
## # A tibble: 25 x 2
##    series_id               series_title
##    <fct>                   <fct>
##  1 "CXUFOODAWAYLB0201M   ~ Food away from home by Income Range: All Consu~
##  2 "CXUFOODAWAYLB0202M   ~ Food away from home by Income Range: Before ta~
##  3 "CXUFOODAWAYLB0203M   ~ Food away from home by Income Range: $5,000 to~
##  4 "CXUFOODAWAYLB0204M   ~ Food away from home by Income Range: $10,000 t~
##  5 "CXUFOODAWAYLB0205M   ~ Food away from home by Income Range: $15,000 t~
##  6 "CXUFOODAWAYLB0206M   ~ Food away from home by Income Range: $20,000 t~
##  7 "CXUFOODAWAYLB0207M   ~ Food away from home by Income Range: $30,000 t~
##  8 "CXUFOODAWAYLB0208M   ~ Food away from home by Income Range: $40,000 t~
##  9 "CXUFOODAWAYLB0209M   ~ Food away from home by Income Range: $50,000 t~
## 10 "CXUFOODAWAYLB0210M   ~ Food away from home by Income Range: Before ta~
## 11 "CXUFOODAWAYLB0211M   ~ Food away from home by Income Range: Before ta~
## 12 "CXUFOODAWAYLB0212M   ~ Food away from home by Income Range: $70,000 t~
## 13 "CXUFOODAWAYLB0213M   ~ Food away from home by Income Range: $80,000 t~
## 14 "CXUFOODAWAYLB0214M   ~ Food away from home by Income Range: Before ta~
## 15 "CXUFOODAWAYLB0215M   ~ Food away from home by Income Range: $100,000 ~
## 16 "CXUFOODAWAYLB0216M   ~ Food away from home by Income Range: $120,000 ~
## 17 "CXUFOODAWAYLB0217M   ~ Food away from home by Income Range: Before ta~
## 18 "CXUFOODAWAYLB0218M   ~ Food away from home by Income Range: Less than~
## 19 "CXUFOODAWAYLB0219M   ~ Food away from home by Income Range: $15,000 t~
## 20 "CXUFOODAWAYLB0220M   ~ Food away from home by Income Range: $70,000 t~
## 21 "CXUFOODAWAYLB0221M   ~ Food away from home by Income Range: $100,000 ~
## 22 "CXUFOODAWAYLB0222M   ~ Food away from home by Income Range: $150,000 ~
```

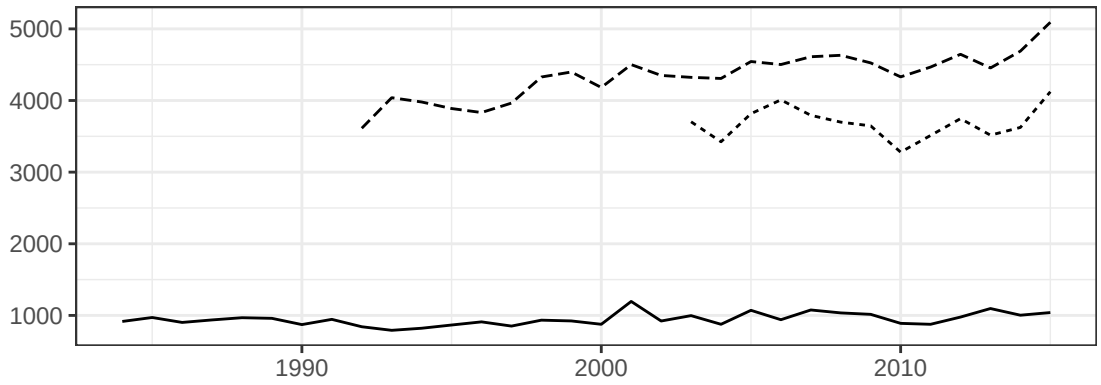
```
## 23 "CXUFOODAWAYLB0223M   ~ Food away from home by Income Range: $200,000 ~
## 24 "CXUFOODAWAYLB02A1M   ~ Food away from home by Income Range: Before ta~
## 25 "CXUFOODAWAYLB02A2M   ~ Food away from home by Income Range: Total com~
```

Prepare Data

```
data <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
               filter(subcategory_code == "FOODTOTL",
                      item_code == "FOODAWAY",
                      demographics_code == "LB02") %>%
               select(series_id, series_title),
             by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year)
```

Plot of Food Away

```
data %>%
  filter(series_id %in% c("CXUFOODAWAYLB0204M", "CXUFOODAWAYLB0210M", "CXUFOODAWAYLB0213M")) %>%
  ggplot(aes(x = year, y = value, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Shelter

List series

```
cx.series %>%
  filter(subcategory_code == "HOUSING",
         item_code == "SHELTER",
         demographics_code == "LB02") %>%
  select(series_id, series_title) %>%
  as.tibble
```

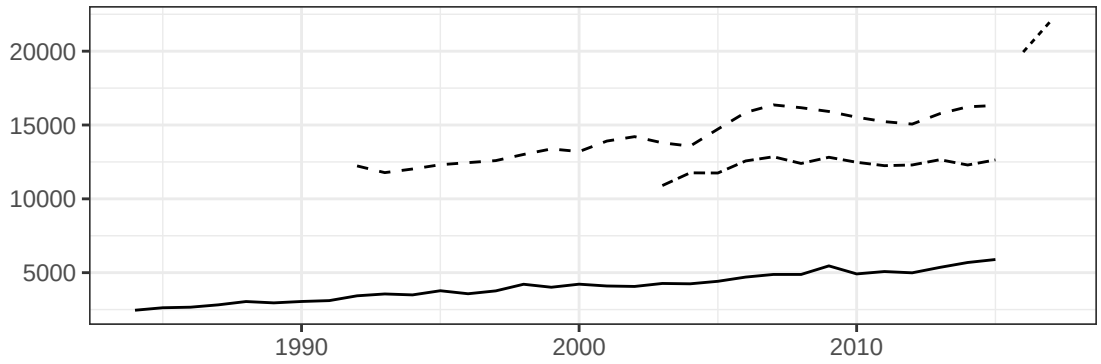
```
## # A tibble: 25 x 2
##    series_id                series_title
##    <fct>                    <fct>
##  1 "CXUSHELTERLB0201M    ~ Shelter by Income Range: All Consumer Units
##  2 "CXUSHELTERLB0202M    ~ Shelter by Income Range: Before tax income of ~
##  3 "CXUSHELTERLB0203M    ~ Shelter by Income Range: $5,000 to $9,999 befo~
##  4 "CXUSHELTERLB0204M    ~ Shelter by Income Range: $10,000 to $14,999 be~
##  5 "CXUSHELTERLB0205M    ~ Shelter by Income Range: $15,000 to $19,999 be~
##  6 "CXUSHELTERLB0206M    ~ Shelter by Income Range: $20,000 to $29,999 be~
##  7 "CXUSHELTERLB0207M    ~ Shelter by Income Range: $30,000 to $39,999 be~
##  8 "CXUSHELTERLB0208M    ~ Shelter by Income Range: $40,000 to $49,999 be~
##  9 "CXUSHELTERLB0209M    ~ Shelter by Income Range: $50,000 to $69,999 be~
## 10 "CXUSHELTERLB0210M    ~ Shelter by Income Range: Before tax income of ~
## 11 "CXUSHELTERLB0211M    ~ Shelter by Income Range: Before tax income of ~
## 12 "CXUSHELTERLB0212M    ~ Shelter by Income Range: $70,000 to $79,999 be~
## 13 "CXUSHELTERLB0213M    ~ Shelter by Income Range: $80,000 to $99,999 be~
## 14 "CXUSHELTERLB0214M    ~ Shelter by Income Range: Before tax income of ~
## 15 "CXUSHELTERLB0215M    ~ Shelter by Income Range: $100,000 to $119,999 ~
## 16 "CXUSHELTERLB0216M    ~ Shelter by Income Range: $120,000 to $149,999 ~
## 17 "CXUSHELTERLB0217M    ~ Shelter by Income Range: Before tax income of ~
## 18 "CXUSHELTERLB0218M    ~ Shelter by Income Range: Less than $15,000
## 19 "CXUSHELTERLB0219M    ~ Shelter by Income Range: $15,000 to $29,999
## 20 "CXUSHELTERLB0220M    ~ Shelter by Income Range: $70,000 to $99,999
## 21 "CXUSHELTERLB0221M    ~ Shelter by Income Range: $100,000 to $149,999
## 22 "CXUSHELTERLB0222M    ~ Shelter by Income Range: $150,000 to $199,999
## 23 "CXUSHELTERLB0223M    ~ Shelter by Income Range: $200,000 and more
## 24 "CXUSHELTERLB02A1M    ~ Shelter by Income Range: Before tax income of ~
## 25 "CXUSHELTERLB02A2M    ~ Shelter by Income Range: Total complete income~
```

Prepare Data

```
data <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
              filter(subcategory_code == "HOUSING",
                     item_code == "SHELTER",
                     demographics_code == "LB02") %>%
               select(series_id, series_title),
             by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year)
```

Plot

```
data %>%
  filter(series_id %in% c("CXUSHELTERLB0204M", "CXUSHELTERLB0210M",
                          "CXUSHELTERLB0213M", "CXUSHELTERLB0213M",
                          "CXUSHELTERLB0222M")) %>%
  ggplot(aes(x = year, y = value, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Pensions

List series:

```
cx.series %>%
  filter(subcategory_code == "INSPENSN",
         item_code == "INSPENSN",
         demographics_code == "LB02") %>%
  select(series_id, series_title) %>%
  as.tibble
```

```
## # A tibble: 25 x 2
##    series_id               series_title
##    <fct>                   <fct>
##  1 "CXUINSPENSNLB0201M   ~ Personal insurance and pensions by Income Rang~
##  2 "CXUINSPENSNLB0202M   ~ Personal insurance and pensions by Income Rang~
##  3 "CXUINSPENSNLB0203M   ~ Personal insurance and pensions by Income Rang~
##  4 "CXUINSPENSNLB0204M   ~ Personal insurance and pensions by Income Rang~
##  5 "CXUINSPENSNLB0205M   ~ Personal insurance and pensions by Income Rang~
##  6 "CXUINSPENSNLB0206M   ~ Personal insurance and pensions by Income Rang~
##  7 "CXUINSPENSNLB0207M   ~ Personal insurance and pensions by Income Rang~
##  8 "CXUINSPENSNLB0208M   ~ Personal insurance and pensions by Income Rang~
##  9 "CXUINSPENSNLB0209M   ~ Personal insurance and pensions by Income Rang~
## 10 "CXUINSPENSNLB0210M   ~ Personal insurance and pensions by Income Rang~
## 11 "CXUINSPENSNLB0211M   ~ Personal insurance and pensions by Income Rang~
## 12 "CXUINSPENSNLB0212M   ~ Personal insurance and pensions by Income Rang~
## 13 "CXUINSPENSNLB0213M   ~ Personal insurance and pensions by Income Rang~
## 14 "CXUINSPENSNLB0214M   ~ Personal insurance and pensions by Income Rang~
## 15 "CXUINSPENSNLB0215M   ~ Personal insurance and pensions by Income Rang~
## 16 "CXUINSPENSNLB0216M   ~ Personal insurance and pensions by Income Rang~
## 17 "CXUINSPENSNLB0217M   ~ Personal insurance and pensions by Income Rang~
## 18 "CXUINSPENSNLB0218M   ~ Personal insurance and pensions by Income Rang~
## 19 "CXUINSPENSNLB0219M   ~ Personal insurance and pensions by Income Rang~
## 20 "CXUINSPENSNLB0220M   ~ Personal insurance and pensions by Income Rang~
## 21 "CXUINSPENSNLB0221M   ~ Personal insurance and pensions by Income Rang~
## 22 "CXUINSPENSNLB0222M   ~ Personal insurance and pensions by Income Rang~
```

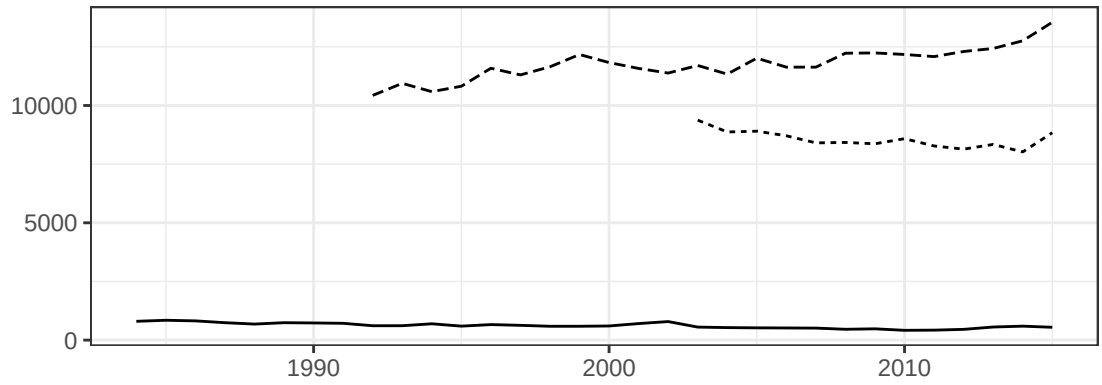
```
## 23 "CXUINSPENSNLB0223M   ~ Personal insurance and pensions by Income Rang~
## 24 "CXUINSPENSNLB02A1M   ~ Personal insurance and pensions by Income Rang~
## 25 "CXUINSPENSNLB02A2M   ~ Personal insurance and pensions by Income Rang~
```

Prepare Data:

```
data <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
               filter(subcategory_code == "INSPENSN",
                      item_code == "INSPENSN",
                      demographics_code == "LB02") %>%
               select(series_id, series_title),
             by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year)
```

Plot:

```
data %>%
  filter(series_id %in% c("CXUINSPENSNLB0204M", "CXUINSPENSNLB0210M", "CXUINSPENSNLB0213M")) %>%
  ggplot(aes(x = year, y = value, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Estimated Rental Value of Owned Home

List series

```
cx.series %>%
   filter(category_code == "ADDENDA",
          subcategory_code == "TITLEOFI",
          item_code == "910050",
          demographics_code == "LB02") %>%
```

```
  select(series_id, series_title) %>%
  as.tibble
```

```
## # A tibble: 25 x 2
##    series_id                series_title
##    <fct>                    <fct>
##  1 "CXU910050LB0201M     ~ Est. monthly rental value of owned home by Inc~
##  2 "CXU910050LB0202M     ~ Est. monthly rental value of owned home by Inc~
##  3 "CXU910050LB0203M     ~ Est. monthly rental value of owned home by Inc~
##  4 "CXU910050LB0204M     ~ Est. monthly rental value of owned home by Inc~
##  5 "CXU910050LB0205M     ~ Est. monthly rental value of owned home by Inc~
##  6 "CXU910050LB0206M     ~ Est. monthly rental value of owned home by Inc~
##  7 "CXU910050LB0207M     ~ Est. monthly rental value of owned home by Inc~
##  8 "CXU910050LB0208M     ~ Est. monthly rental value of owned home by Inc~
##  9 "CXU910050LB0209M     ~ Est. monthly rental value of owned home by Inc~
## 10 "CXU910050LB0210M     ~ Est. monthly rental value of owned home by Inc~
## 11 "CXU910050LB0211M     ~ Est. monthly rental value of owned home by Inc~
## 12 "CXU910050LB0212M     ~ Est. monthly rental value of owned home by Inc~
## 13 "CXU910050LB0213M     ~ Est. monthly rental value of owned home by Inc~
## 14 "CXU910050LB0214M     ~ Est. monthly rental value of owned home by Inc~
## 15 "CXU910050LB0215M     ~ Est. monthly rental value of owned home by Inc~
## 16 "CXU910050LB0216M     ~ Est. monthly rental value of owned home by Inc~
## 17 "CXU910050LB0217M     ~ Est. monthly rental value of owned home by Inc~
## 18 "CXU910050LB0218M     ~ Est. monthly rental value of owned home by Inc~
## 19 "CXU910050LB0219M     ~ Est. monthly rental value of owned home by Inc~
## 20 "CXU910050LB0220M     ~ Est. monthly rental value of owned home by Inc~
## 21 "CXU910050LB0221M     ~ Est. monthly rental value of owned home by Inc~
## 22 "CXU910050LB0222M     ~ Est. monthly rental value of owned home by Inc~
## 23 "CXU910050LB0223M     ~ Est. monthly rental value of owned home by Inc~
## 24 "CXU910050LB02A1M     ~ Est. monthly rental value of owned home by Inc~
## 25 "CXU910050LB02A2M     ~ Est. monthly rental value of owned home by Inc~
```

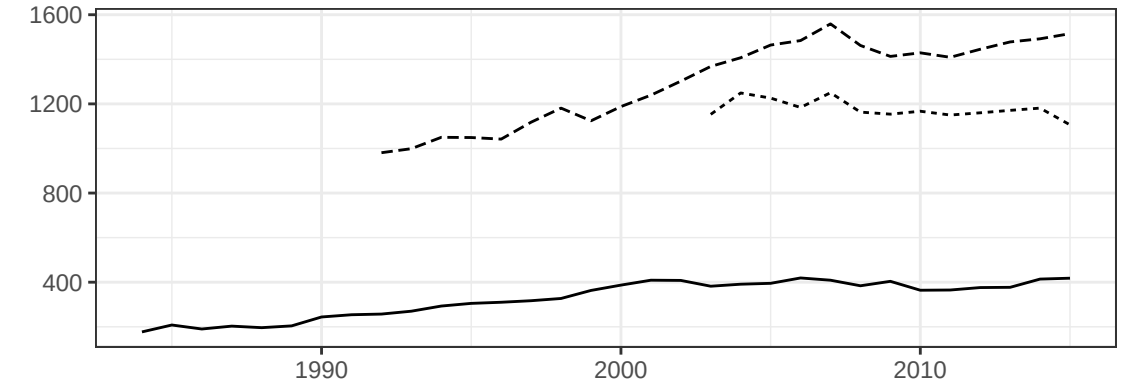
Prepare Data

```
data <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
               filter(category_code == "ADDENDA",
                      subcategory_code == "TITLEOFI",
                      item_code == "910050",
                      demographics_code == "LB02") %>%
               select(series_id, series_title),
             by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year)
```

Plot

```
data %>%
  filter(series_id %in% c("CXU910050LB0204M", "CXU910050LB0210M", "CXU910050LB0213M")) %>%
  ggplot(aes(x = year, y = value, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
```

```
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Vehicle Purchases

List series:

```
cx.series %>%
   filter(category_code == "EXPEND",
          subcategory_code == "TRANS",
          item_code == "500110",
          demographics_code == "LB02") %>%
  select(series_id, series_title) %>%
  as.tibble
```

```
## # A tibble: 25 x 2
##    series_id               series_title
##    <fct>                   <fct>
##  1 "CXU500110LB0201M     ~ Vehicle insurance by Income Range: All Consume~
##  2 "CXU500110LB0202M     ~ Vehicle insurance by Income Range: Before tax ~
##  3 "CXU500110LB0203M     ~ Vehicle insurance by Income Range: $5,000 to $~
##  4 "CXU500110LB0204M     ~ Vehicle insurance by Income Range: $10,000 to ~
##  5 "CXU500110LB0205M     ~ Vehicle insurance by Income Range: $15,000 to ~
##  6 "CXU500110LB0206M     ~ Vehicle insurance by Income Range: $20,000 to ~
##  7 "CXU500110LB0207M     ~ Vehicle insurance by Income Range: $30,000 to ~
##  8 "CXU500110LB0208M     ~ Vehicle insurance by Income Range: $40,000 to ~
##  9 "CXU500110LB0209M     ~ Vehicle insurance by Income Range: $50,000 to ~
## 10 "CXU500110LB0210M     ~ Vehicle insurance by Income Range: Before tax ~
## 11 "CXU500110LB0211M     ~ Vehicle insurance by Income Range: Before tax ~
## 12 "CXU500110LB0212M     ~ Vehicle insurance by Income Range: $70,000 to ~
## 13 "CXU500110LB0213M     ~ Vehicle insurance by Income Range: $80,000 to ~
## 14 "CXU500110LB0214M     ~ Vehicle insurance by Income Range: Before tax ~
## 15 "CXU500110LB0215M     ~ Vehicle insurance by Income Range: $100,000 to~
## 16 "CXU500110LB0216M     ~ Vehicle insurance by Income Range: $120,000 to~
## 17 "CXU500110LB0217M     ~ Vehicle insurance by Income Range: Before tax ~
## 18 "CXU500110LB0218M     ~ Vehicle insurance by Income Range: Less than $~
## 19 "CXU500110LB0219M     ~ Vehicle insurance by Income Range: $15,000 to ~
```

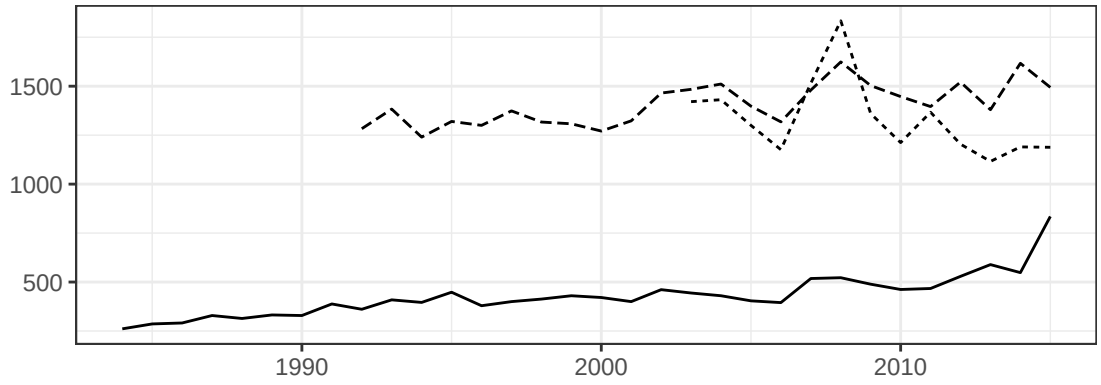
```
## 20 "CXU500110LB0220M"     ~ Vehicle insurance by Income Range: $70,000 to ~
## 21 "CXU500110LB0221M"     ~ Vehicle insurance by Income Range: $100,000 to~
## 22 "CXU500110LB0222M"     ~ Vehicle insurance by Income Range: $150,000 to~
## 23 "CXU500110LB0223M"     ~ Vehicle insurance by Income Range: $200,000 an~
## 24 "CXU500110LB02A1M"     ~ Vehicle insurance by Income Range: Before tax ~
## 25 "CXU500110LB02A2M"     ~ Vehicle insurance by Income Range: Total compl~
```

Prepare Data

```
data <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
               filter(category_code == "EXPEND",
                      subcategory_code == "TRANS",
                      item_code == "500110",
                      demographics_code == "LB02") %>%
               select(series_id, series_title),
             by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year)
```

Plot

```
data %>%
  filter(series_id %in% c("CXU500110LB0204M", "CXU500110LB0210M", "CXU500110LB0213M")) %>%
  ggplot(aes(x = year, y = value, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Household Furnishings

List series

```
cx.series %>%
   filter(category_code == "EXPEND",
```

```
          subcategory_code == "HOUSING",
          item_code == "HHFURNSH",
          demographics_code == "LB02") %>%
  select(series_id, series_title) %>%
  as.tibble
```

```
## # A tibble: 25 x 2
##    series_id                series_title
##    <fct>                    <fct>
##  1 "CXUHHFURNSHLB0201M   ~ Household furnishings and equipment by Income ~
##  2 "CXUHHFURNSHLB0202M   ~ Household furnishings and equipment by Income ~
##  3 "CXUHHFURNSHLB0203M   ~ Household furnishings and equipment by Income ~
##  4 "CXUHHFURNSHLB0204M   ~ Household furnishings and equipment by Income ~
##  5 "CXUHHFURNSHLB0205M   ~ Household furnishings and equipment by Income ~
##  6 "CXUHHFURNSHLB0206M   ~ Household furnishings and equipment by Income ~
##  7 "CXUHHFURNSHLB0207M   ~ Household furnishings and equipment by Income ~
##  8 "CXUHHFURNSHLB0208M   ~ Household furnishings and equipment by Income ~
##  9 "CXUHHFURNSHLB0209M   ~ Household furnishings and equipment by Income ~
## 10 "CXUHHFURNSHLB0210M   ~ Household furnishings and equipment by Income ~
## 11 "CXUHHFURNSHLB0211M   ~ Household furnishings and equipment by Income ~
## 12 "CXUHHFURNSHLB0212M   ~ Household furnishings and equipment by Income ~
## 13 "CXUHHFURNSHLB0213M   ~ Household furnishings and equipment by Income ~
## 14 "CXUHHFURNSHLB0214M   ~ Household furnishings and equipment by Income ~
## 15 "CXUHHFURNSHLB0215M   ~ Household furnishings and equipment by Income ~
## 16 "CXUHHFURNSHLB0216M   ~ Household furnishings and equipment by Income ~
## 17 "CXUHHFURNSHLB0217M   ~ Household furnishings and equipment by Income ~
## 18 "CXUHHFURNSHLB0218M   ~ Household furnishings and equipment by Income ~
## 19 "CXUHHFURNSHLB0219M   ~ Household furnishings and equipment by Income ~
## 20 "CXUHHFURNSHLB0220M   ~ Household furnishings and equipment by Income ~
## 21 "CXUHHFURNSHLB0221M   ~ Household furnishings and equipment by Income ~
## 22 "CXUHHFURNSHLB0222M   ~ Household furnishings and equipment by Income ~
## 23 "CXUHHFURNSHLB0223M   ~ Household furnishings and equipment by Income ~
## 24 "CXUHHFURNSHLB02A1M   ~ Household furnishings and equipment by Income ~
## 25 "CXUHHFURNSHLB02A2M   ~ Household furnishings and equipment by Income ~
```

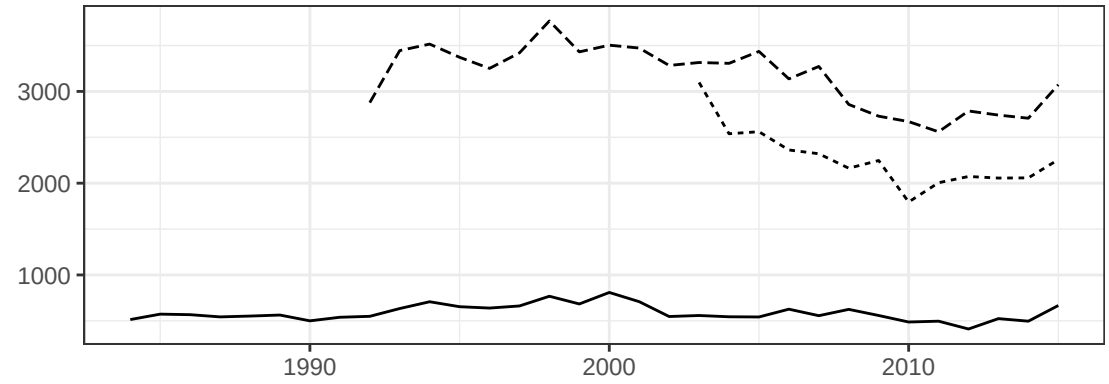
Prepare Data

```
data <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
               filter(category_code == "EXPEND",
                      subcategory_code == "HOUSING",
                      item_code == "HHFURNSH",
                      demographics_code == "LB02") %>%
               select(series_id, series_title),
             by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year)
```

Plot

```
data %>%
  filter(series_id %in% c("CXUHHFURNSHLB0204M", "CXUHHFURNSHLB0210M", "CXUHHFURNSHLB0213M")) %>%
  ggplot(aes(x = year, y = value, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
```

```
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Household furnishings and equipment by Income Range: $10,000 to $14,999 before tax income
Household furnishings and equipment by Income Range: $80,000 to $99,999 before tax income(from
Household furnishings and equipment by Income Range: Before tax income of $70,000 and over

Income after taxes

List series

```
cx.series %>%
   filter(category_code == "CUCHARS",
          subcategory_code == "TITLECU",
          item_code == "INCAFTAX",
          demographics_code == "LB02") %>%
  select(series_id, series_title) %>%
  as.tibble
```

```
## # A tibble: 25 x 2
##    series_id               series_title
##    <fct>                   <fct>
##  1 "CXUINCAFTAXLB0201M   ~ Income after taxes by Income Range: All Consum~
##  2 "CXUINCAFTAXLB0202M   ~ Income after taxes by Income Range: Before tax~
##  3 "CXUINCAFTAXLB0203M   ~ Income after taxes by Income Range: $5,000 to ~
##  4 "CXUINCAFTAXLB0204M   ~ Income after taxes by Income Range: $10,000 to~
##  5 "CXUINCAFTAXLB0205M   ~ Income after taxes by Income Range: $15,000 to~
##  6 "CXUINCAFTAXLB0206M   ~ Income after taxes by Income Range: $20,000 to~
##  7 "CXUINCAFTAXLB0207M   ~ Income after taxes by Income Range: $30,000 to~
##  8 "CXUINCAFTAXLB0208M   ~ Income after taxes by Income Range: $40,000 to~
##  9 "CXUINCAFTAXLB0209M   ~ Income after taxes by Income Range: $50,000 to~
## 10 "CXUINCAFTAXLB0210M   ~ Income after taxes by Income Range: Before tax~
## 11 "CXUINCAFTAXLB0211M   ~ Income after taxes by Income Range: Before tax~
## 12 "CXUINCAFTAXLB0212M   ~ Income after taxes by Income Range: $70,000 to~
## 13 "CXUINCAFTAXLB0213M   ~ Income after taxes by Income Range: $80,000 to~
## 14 "CXUINCAFTAXLB0214M   ~ Income after taxes by Income Range: Before tax~
## 15 "CXUINCAFTAXLB0215M   ~ Income after taxes by Income Range: $100,000 t~
## 16 "CXUINCAFTAXLB0216M   ~ Income after taxes by Income Range: $120,000 t~
## 17 "CXUINCAFTAXLB0217M   ~ Income after taxes by Income Range: Before tax~
```

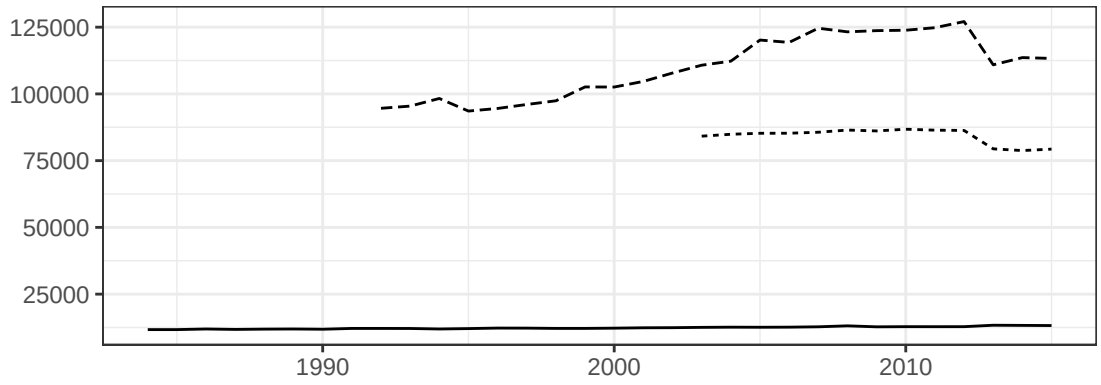
```
## 18 "CXUINCAFTAXLB0218M   ~ Income after taxes by Income Range: Less than ~
## 19 "CXUINCAFTAXLB0219M   ~ Income after taxes by Income Range: $15,000 to~
## 20 "CXUINCAFTAXLB0220M   ~ Income after taxes by Income Range: $70,000 to~
## 21 "CXUINCAFTAXLB0221M   ~ Income after taxes by Income Range: $100,000 t~
## 22 "CXUINCAFTAXLB0222M   ~ Income after taxes by Income Range: $150,000 t~
## 23 "CXUINCAFTAXLB0223M   ~ Income after taxes by Income Range: $200,000 a~
## 24 "CXUINCAFTAXLB02A1M   ~ Income after taxes by Income Range: Before tax~
## 25 "CXUINCAFTAXLB02A2M   ~ Income after taxes by Income Range: Total comp~
```

Prepare Data

```
data <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
              filter(category_code == "CUCHARS",
                     subcategory_code == "TITLECU",
                     item_code == "INCAFTAX",
                     demographics_code == "LB02") %>%
               select(series_id, series_title),
             by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year)
```

Plot

```
data %>%
  filter(series_id %in% c("CXUINCAFTAXLB0204M", "CXUINCAFTAXLB0210M", "CXUINCAFTAXLB0213M")) %>%
  ggplot(aes(x = year, y = value, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Average Annual Expenditures

List series

```
cx.series %>%
   filter(category_code == "EXPEND",
          subcategory_code == "TOTALEXP",
          item_code == "TOTALEXP",
          demographics_code == "LB02") %>%
  select(series_id, series_title) %>%
  as.tibble
```

```
## # A tibble: 25 x 2
##    series_id                series_title
##    <fct>                    <fct>
##  1 "CXUTOTALEXPLB0201M   ~ Total average annual expenditures by Income Ra~
##  2 "CXUTOTALEXPLB0202M   ~ Total average annual expenditures by Income Ra~
##  3 "CXUTOTALEXPLB0203M   ~ Total average annual expenditures by Income Ra~
##  4 "CXUTOTALEXPLB0204M   ~ Total average annual expenditures by Income Ra~
##  5 "CXUTOTALEXPLB0205M   ~ Total average annual expenditures by Income Ra~
##  6 "CXUTOTALEXPLB0206M   ~ Total average annual expenditures by Income Ra~
##  7 "CXUTOTALEXPLB0207M   ~ Total average annual expenditures by Income Ra~
##  8 "CXUTOTALEXPLB0208M   ~ Total average annual expenditures by Income Ra~
##  9 "CXUTOTALEXPLB0209M   ~ Total average annual expenditures by Income Ra~
## 10 "CXUTOTALEXPLB0210M   ~ Total average annual expenditures by Income Ra~
## 11 "CXUTOTALEXPLB0211M   ~ Total average annual expenditures by Income Ra~
## 12 "CXUTOTALEXPLB0212M   ~ Total average annual expenditures by Income Ra~
## 13 "CXUTOTALEXPLB0213M   ~ Total average annual expenditures by Income Ra~
## 14 "CXUTOTALEXPLB0214M   ~ Total average annual expenditures by Income Ra~
## 15 "CXUTOTALEXPLB0215M   ~ Total average annual expenditures by Income Ra~
## 16 "CXUTOTALEXPLB0216M   ~ Total average annual expenditures by Income Ra~
## 17 "CXUTOTALEXPLB0217M   ~ Total average annual expenditures by Income Ra~
## 18 "CXUTOTALEXPLB0218M   ~ Total average annual expenditures by Income Ra~
## 19 "CXUTOTALEXPLB0219M   ~ Total average annual expenditures by Income Ra~
## 20 "CXUTOTALEXPLB0220M   ~ Total average annual expenditures by Income Ra~
## 21 "CXUTOTALEXPLB0221M   ~ Total average annual expenditures by Income Ra~
## 22 "CXUTOTALEXPLB0222M   ~ Total average annual expenditures by Income Ra~
## 23 "CXUTOTALEXPLB0223M   ~ Total average annual expenditures by Income Ra~
## 24 "CXUTOTALEXPLB02A1M   ~ Total average annual expenditures by Income Ra~
## 25 "CXUTOTALEXPLB02A2M   ~ Total average annual expenditures by Income Ra~
```

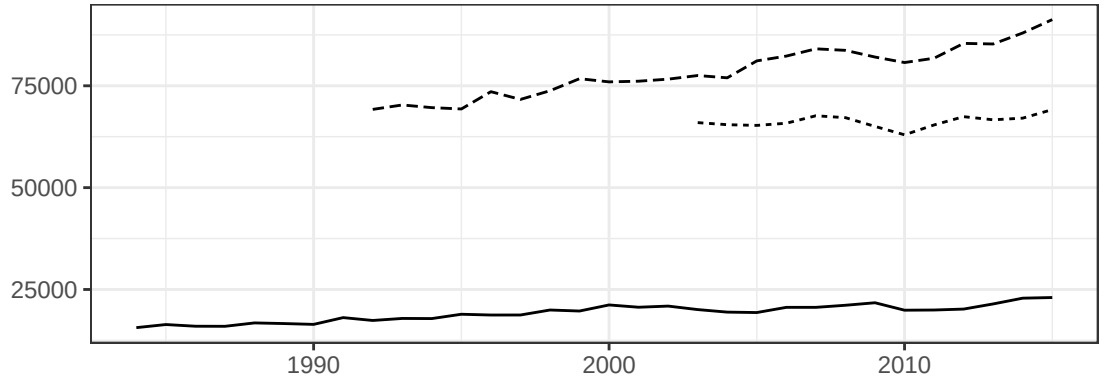
Prepare Data

```
data <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
               filter(category_code == "EXPEND",
                      subcategory_code == "TOTALEXP",
                      item_code == "TOTALEXP",
                      demographics_code == "LB02") %>%
                select(series_id, series_title),
             by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year)
```

Plot

```
data %>%
  filter(series_id %in% c("CXUTOTALEXPLB0204M", "CXUTOTALEXPLB0210M", "CXUTOTALEXPLB0213M")) %>%
```

```
  ggplot(aes(x = year, y = value, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Saving Rate by Income according to CEX

List series

```
cx.series %>%
   filter(category_code == "EXPEND",
          subcategory_code == "TOTALEXP",
          item_code == "TOTALEXP",
          demographics_code == "LB02") %>%
  select(series_id, series_title) %>%
  as.tibble
```

```
## # A tibble: 25 x 2
##    series_id               series_title
##    <fct>                   <fct>
##  1 "CXUTOTALEXPLB0201M   ~ Total average annual expenditures by Income Ra~
##  2 "CXUTOTALEXPLB0202M   ~ Total average annual expenditures by Income Ra~
##  3 "CXUTOTALEXPLB0203M   ~ Total average annual expenditures by Income Ra~
##  4 "CXUTOTALEXPLB0204M   ~ Total average annual expenditures by Income Ra~
##  5 "CXUTOTALEXPLB0205M   ~ Total average annual expenditures by Income Ra~
##  6 "CXUTOTALEXPLB0206M   ~ Total average annual expenditures by Income Ra~
##  7 "CXUTOTALEXPLB0207M   ~ Total average annual expenditures by Income Ra~
##  8 "CXUTOTALEXPLB0208M   ~ Total average annual expenditures by Income Ra~
##  9 "CXUTOTALEXPLB0209M   ~ Total average annual expenditures by Income Ra~
## 10 "CXUTOTALEXPLB0210M   ~ Total average annual expenditures by Income Ra~
## 11 "CXUTOTALEXPLB0211M   ~ Total average annual expenditures by Income Ra~
## 12 "CXUTOTALEXPLB0212M   ~ Total average annual expenditures by Income Ra~
## 13 "CXUTOTALEXPLB0213M   ~ Total average annual expenditures by Income Ra~
## 14 "CXUTOTALEXPLB0214M   ~ Total average annual expenditures by Income Ra~
```

```
## 15 "CXUTOTALEXPLB0215M   ~ Total average annual expenditures by Income Ra~
## 16 "CXUTOTALEXPLB0216M   ~ Total average annual expenditures by Income Ra~
## 17 "CXUTOTALEXPLB0217M   ~ Total average annual expenditures by Income Ra~
## 18 "CXUTOTALEXPLB0218M   ~ Total average annual expenditures by Income Ra~
## 19 "CXUTOTALEXPLB0219M   ~ Total average annual expenditures by Income Ra~
## 20 "CXUTOTALEXPLB0220M   ~ Total average annual expenditures by Income Ra~
## 21 "CXUTOTALEXPLB0221M   ~ Total average annual expenditures by Income Ra~
## 22 "CXUTOTALEXPLB0222M   ~ Total average annual expenditures by Income Ra~
## 23 "CXUTOTALEXPLB0223M   ~ Total average annual expenditures by Income Ra~
## 24 "CXUTOTALEXPLB02A1M   ~ Total average annual expenditures by Income Ra~
## 25 "CXUTOTALEXPLB02A2M   ~ Total average annual expenditures by Income Ra~
```

Prepare Data

```
data1 <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
              filter(category_code == "EXPEND",
                     subcategory_code == "TOTALEXP",
                     item_code == "TOTALEXP",
                     demographics_code == "LB02") %>%
               select(series_id, series_title),
            by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year) %>%
  select(-series_title) %>%
  mutate(series_id = series_id %>% substr(16, 17) %>% as.numeric) %>%
  rename(exp = value) %>%
  na.omit
```

```
## Warning in function_list[[k]](value): NAs introduced by coercion
```

```
data2 <- cx.data.1.AllData %>%
  select(series_id, year, value) %>%
  right_join(cx.series %>%
              filter(category_code == "CUCHARS",
                     subcategory_code == "TITLECU",
                     item_code == "INCAFTAX",
                     demographics_code == "LB02") %>%
               select(series_id, series_title),
            by = "series_id") %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  arrange(series_id, year) %>%
  mutate(series_id = series_id %>% substr(16, 17) %>% as.numeric) %>%
  rename(inc = value) %>%
  na.omit
```

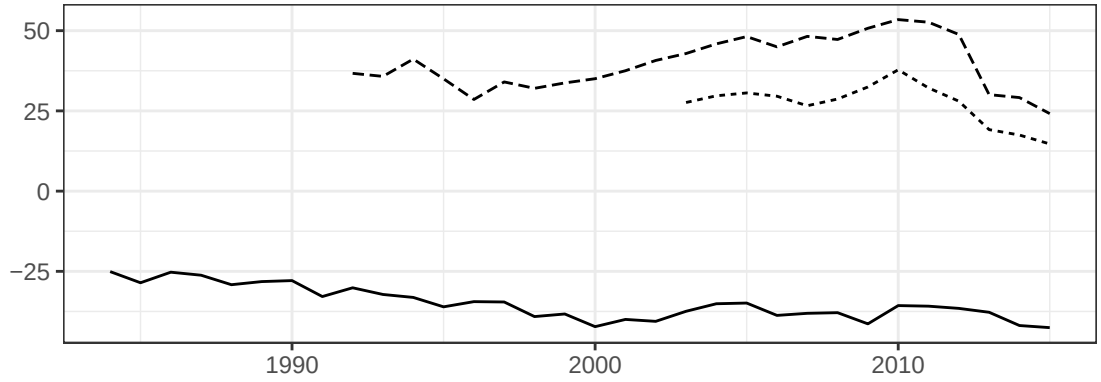
```
## Warning in function_list[[k]](value): NAs introduced by coercion
```

```
data.merged <- data1 %>%
  full_join(data2, by = c("series_id", "year")) %>%
  mutate(saving = 100*(inc - exp)/exp)
```

Plot

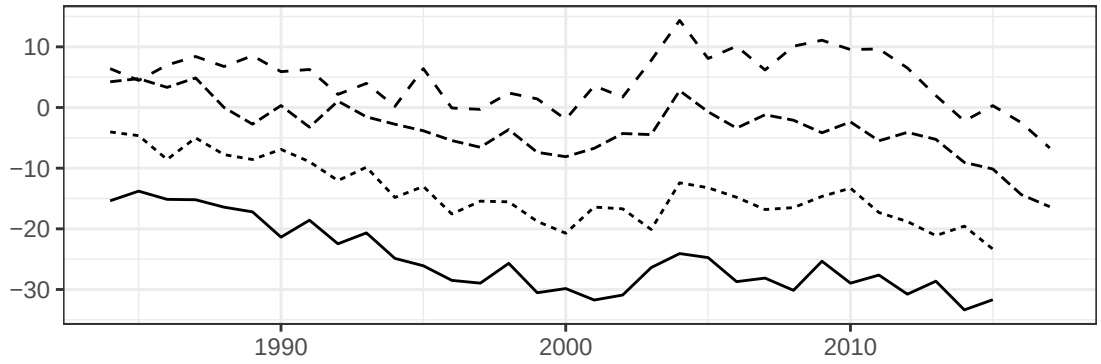
```
data.merged %>%
  filter(series_id %in% c(4, 10, 13)) %>%
```

```
  ggplot(aes(x = year, y = saving, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Income after taxes by Income Range: $10,000 to $14,999 before tax income
Income after taxes by Income Range: $80,000 to $99,999 before tax income(from 2003)
Income after taxes by Income Range: Before tax income of $70,000 and over

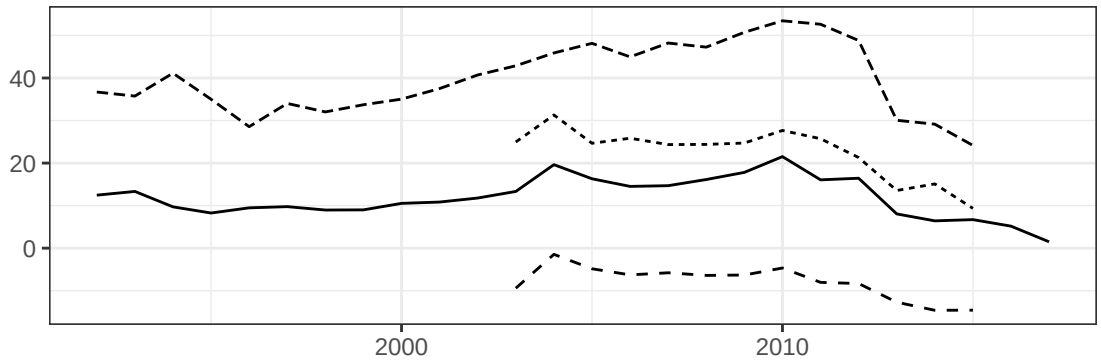
```
data.merged %>%
  filter(series_id %in% c(5, 6, 7, 8)) %>%
  ggplot(aes(x = year, y = saving, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Income after taxes by Income Range: $15,000 to $19,999 before tax income
Income after taxes by Income Range: $20,000 to $29,999 before tax income
Income after taxes by Income Range: $30,000 to $39,999 before tax income
Income after taxes by Income Range: $40,000 to $49,999 before tax income

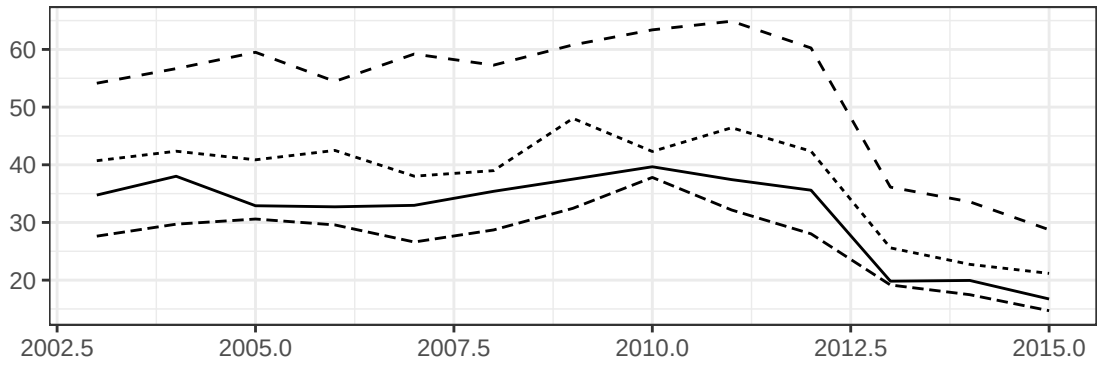
```
data.merged %>%
  filter(series_id %in% c(9, 10, 11, 12)) %>%
  ggplot(aes(x = year, y = saving, linetype = series_title)) +
```

```
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Income after taxes by Income Range: $50,000 to $69,999 before tax income
Income after taxes by Income Range: $70,000 to $79,999 before tax income(from 2003)
Income after taxes by Income Range: Before tax income of $70,000 and over
Income after taxes by Income Range: Before tax income of less than $70,000(from 2003)

```
data.merged %>%
  filter(series_id %in% c(13, 14, 15, 16)) %>%
  ggplot(aes(x = year, y = saving, linetype = series_title)) +
  geom_line() + theme_bw() +
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```



Income after taxes by Income Range: $100,000 to $119,999 before tax income(from 2003)
Income after taxes by Income Range: $120,000 to $149,999 before tax income(from 2003)
Income after taxes by Income Range: $80,000 to $99,999 before tax income(from 2003)
Income after taxes by Income Range: Before tax income of $100,000 and over(from 2003)

```
data.merged %>%
  filter(series_id %in% c(17, 18, 19, 20)) %>%
  ggplot(aes(x = year, y = saving, linetype = series_title)) +
  geom_line() + theme_bw() +
```

```
  theme(legend.position = "bottom",
        legend.title = element_blank(),
        legend.key.height = unit(0.1, "line")) +
  guides(linetype = guide_legend(nrow = 4)) + xlab("") + ylab("")
```

Income after taxes by Income Range: $15,000 to $29,999
Income after taxes by Income Range: $70,000 to $99,999
Income after taxes by Income Range: Before tax income of $150,000 and over(from 2003)
Income after taxes by Income Range: Less than $15,000

Computing environment

```
Sys.time()
```

```
## [1] "2018-09-25 13:23:09 PDT"
```

```
sessionInfo()
```

```
## R version 3.5.1 (2018-07-02)
## Platform: x86_64-apple-darwin15.6.0 (64-bit)
## Running under: macOS High Sierra 10.13.6
##
## Matrix products: default
## BLAS: /Library/Frameworks/R.framework/Versions/3.5/Resources/lib/libRblas.0.dylib
## LAPACK: /Library/Frameworks/R.framework/Versions/3.5/Resources/lib/libRlapack.dylib
##
## locale:
## [1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
##  [1] bindrcpp_0.2.2  rvest_0.3.2     xml2_1.2.0      forcats_0.3.0
##  [5] stringr_1.3.1   dplyr_0.7.6     purrr_0.2.5     readr_1.1.1
##  [9] tidyr_0.8.1     tibble_1.4.2    ggplot2_3.0.0   tidyverse_1.2.1
## [13] curl_3.2
##
## loaded via a namespace (and not attached):
##  [1] Rcpp_0.12.18     cellranger_1.1.0 pillar_1.3.0     compiler_3.5.1
```

```
##  [5] plyr_1.8.4       bindr_0.1.1      tools_3.5.1      digest_0.6.15
##  [9] lubridate_1.7.4  jsonlite_1.5     evaluate_0.11    nlme_3.1-137
## [13] gtable_0.2.0     lattice_0.20-35  pkgconfig_2.0.2  rlang_0.2.2
## [17] cli_1.0.0        rstudioapi_0.7   yaml_2.2.0       haven_1.1.2
## [21] withr_2.1.2      httr_1.3.1       knitr_1.20       hms_0.4.2
## [25] rprojroot_1.3-2  grid_3.5.1       tidyselect_0.2.4 glue_1.3.0
## [29] R6_2.2.2         fansi_0.3.0      readxl_1.1.0     rmarkdown_1.10
## [33] modelr_0.1.2     magrittr_1.5     backports_1.1.2  scales_1.0.0
## [37] htmltools_0.3.6  assertthat_0.2.0 colorspace_1.3-2 labeling_0.3
## [41] utf8_1.1.4       stringi_1.2.4    lazyeval_0.2.1   munsell_0.5.0
## [45] broom_0.5.0      crayon_1.3.4
```