

```

----
title: "US Top Income Share 1913 ~ 2015 (도표)"
author: "coop711"
date: "`r Sys.Date()`"
output: html_document
----

```{r, setup , include = FALSE}
knitr::opts_chunk$set(echo = FALSE)
```

## Data

준비한 자료는 [E. Saez 교수의 홈페이지](http://elsa.berkeley.edu/~saez/)에 있는
[TabFig2015prel.xls](http://eml.berkeley.edu/~saez/TabFig2015prel.xls) 를 손봐서 불러들인 것
이다.

```{r, data preparation, echo = FALSE, message = FALSE, results = 'hide'}
options(digits = 2)
load("US_top_income_shares_2015_add.rda")
ls()
```

<!--작업을 마친 자료파일은 `US.top.income.shares.15`이며, 이 자료의 구조와 앞의 몇 열의 값은 다음과 같다.-->
>

```{r, data structure, echo = FALSE, results = 'hide'}
library(knitr)
str(US.top.income.shares.15)
```

```{r, data for Table 3, echo = FALSE}
kable(US.top.income.shares.15[c(11:20, 41:51, 92:103),])
```

### Top 10%의 소득점유율

소득 상위 10%(`P90_100`)의 소득점유율 변화

```{r, top 10, echo = FALSE, message = FALSE, warning = FALSE, fig.width = 12, fig.height = 6.75}
png(file = "../pics/US_top_income_share_10_2015_72dpi_kr.png", width = 864, height = 486)
png(file = "../pics/US_top_income_share_10_2015_300dpi_kr.png", width = 1280, height = 720)
par(family = "HCR Dotum LVT")
x.lab <- "연도"
y.lab <- "소득 점유(%)"
plot(P90_100 ~ Year, data = US.top.income.shares.15, xlab = x.lab, ylab = y.lab, xlim = c(1910, 2020), ylim = c(30, 52), xaxt = "n", type = "b", pch = 17)
axis(side = 1, at = seq(1910, 2020, by = 10), labels = seq(1910, 2020, by = 10))
lines(P95_99 ~ Year, data = US.top.income.shares.15, type = "b", pch = 17, col = "red")
lines(P90_95 ~ Year, data = US.top.income.shares.15, type = "b", pch = 17, col = "blue")
abline(h = seq(30, 50, by = 5), lty = 3)
abline(v = seq(1910, 2020, by = 10), lty = 3)
legend.text <- "Top 10% (incomes above $121,360 in 2015)"
legend(x = 1940, y = 25, legend = legend.text, pch = 17, col = "black")
main.title <- "미국 상위 10% 소득 점유(1917 ~ 2015)"
title(main = main.title)
text(x = c(1927.5, 2007, 2012.5, 2016.5), y = c(50, 50, 51, 50.5), labels = c("1928", "2007", "2012", "2015"), pos = 3)
times.label <- c("대공황", "대번영", "대침체")
text(x = c(1935, 1965, 2015), y = c(48.5, 32, 46.5), label = times.label, cex = 1.5, col = "red")
dev.copy(png, file = "../pics/US_top_income_share_1-4-5_2015_kr.png", width = 960, height = 540)
dev.off()
```

```

Top 10% 분할

소득 상위 10%(`P90_100`)를 상위 1%(`P99_100`), 차상위 4%(`P95_99`), 차차상위 5%(`P90_95`)로 분할

```
```{r, partition top 10, echo = FALSE, message = FALSE, warning = FALSE, fig.width = 12,
fig.height = 6.75}
png(file = "../pics/US_top_income_share_1-4-5_2015_72dpi_kr.png", width = 864, height =
486)
png(file = "../pics/US_top_income_share_1-4-5_2015_300dpi_kr.png", width = 1280, height
= 720)
par(family = "HCR Dotum LVT")
plot(P99_100 ~ Year, data = US.top.income.shares.15, xlab = x.lab, ylab = y.lab, xlim =
c(1910, 2020), ylim = c(5, 25), xaxt = "n", type = "b", pch = 17)
axis(side = 1, at = seq(1910, 2020, by = 10), labels = seq(1910, 2020, by = 10))
lines(P95_99 ~ Year, data = US.top.income.shares.15, type = "b", pch = 17, col = "red")
lines(P90_95 ~ Year, data = US.top.income.shares.15, type = "b", pch = 17, col = "blue")
abline(h = seq(5, 25, by = 5), lty = 3)
abline(v = seq(1910, 2020, by = 10), lty = 3)
legend.text.1 <- c("99-100%:$442,900 이상(2015년 기준)", "95-99%:$180,500-$442,900", "90-
95%:$124,810-$180,500")
legend(x = 1947, y = 25, legend = legend.text.1, pch = 17, col = c("black", "red",
"blue"))
main.title.1 <- "미국 상위 10% 소득 점유 분할 (1913 ~ 2015)"
title(main = main.title.1)
text(x = c(1924, 2007), y = c(23.5, 23.5), labels = c("1928", "2007"), pos = 3)
text(x = c(1935, 1965, 2015), y = c(22, 8, 18), label = times.label, cex = 1.5, col =
"red")
dev.copy(png, file = "../pics/US_top_income_share_1-4-5_2015_kr.png", width = 960,
height = 540)
dev.off()
```
```

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Top 1% 분할

소득 상위 1%(`P99_100`)를 상위 0.1%(`P99.9_100`), 차상위 0.4%(`P99.5_99.9`), 차차상위 0.5%(`P99_99.5`)로 분할

```
```{r, partition top 1, echo = FALSE, message = FALSE, warning = FALSE, fig.width = 12,
fig.height = 6.75}
png(file = "../pics/US_top_income_share_0.1-0.4-0.5_2015_72dpi_kr.png", width = 864,
height = 486)
png(file = "../pics/US_top_income_share_0.1-0.4-0.5_2015_300dpi_kr.png", width = 1280,
height = 720)
par(family = "HCR Dotum LVT")
plot(P99.9_100 ~ Year, data = US.top.income.shares.15, xlab = x.lab, ylab = y.lab, xlim =
c(1910, 2020), ylim = c(0, 13), xaxt = "n", yaxt = "n", type = "b", pch = 17)
axis(side = 1, at = seq(1910, 2020, by = 10), labels = seq(1910, 2020, by = 10))
axis(side = 2, at = seq(0, 12, by = 3), labels = seq(0, 12, by = 3))
lines(P99.5_99.9 ~ Year, data = US.top.income.shares.15, type = "b", pch = 17, col =
"red")
lines(P99_99.5 ~ Year, data = US.top.income.shares.15, type = "b", pch = 17, col =
"blue")
abline(h = seq(0, 12, by = 3), lty = 3)
abline(v = seq(1910, 2020, by = 10), lty = 3)
legend.text.2 <- c("99.9-100%:$2,045,000 이상(2015년 기준)", "99.5-99.9%:$682,080-
$2,045,000", "99-99.5%:$442,900-$682,080")
legend(x = 1946, y = 13, legend = legend.text.2, pch = 17, col = c("black", "red",
"blue"))
main.title.2 <- "미국 상위 1% 소득 점유 분할 (1913 ~ 2015)"
title(main = main.title.2)
text(x = c(1924, 2007), y = c(11, 12.5), labels = c("1928", "2007"), pos = 3)
text(x = c(1935, 1965, 2015), y = c(10, 2, 8), label = times.label, cex = 1.5, col =
"red")
dev.copy(png, file = "../pics/US_top_income_share_0.1-0.4-0.5_2015_kr.png", width =
960, height = 540)
dev.off()
```
```

```

### ### Top 0.1% 분할

소득 상위 0.1%(`P99.9\_100`)를 상위 0.01%(`P99.99\_100`)와 다음 0.09%(`P99.9.99.99`)로 분할

```
```{r, partition top 1 0.01 vs 0.99, echo = FALSE, message = FALSE, warning = FALSE,
fig.width = 12, fig.height = 6.75}
png(file = "../pics/US_top_income_share_0.01-0.09_2015_72dpi_kr.png", width = 864, height
= 486)
# png(file = "../pics/US_top_income_share_0.01-0.09_2015_300dpi_kr.png", width = 1280,
height = 720)
par(family = "HCR Dotum LVT")
plot(P99.99_100 ~ Year, data = US.top.income.shares.15, xlab = x.lab, ylab = y.lab, xlim
= c(1910, 2020), ylim = c(0, 7), xaxt = "n", type = "b", pch = 17)
axis(side = 1, at = seq(1910, 2020, by = 10), labels = seq(1910, 2020, by = 10))
lines(P99.9_99.99 ~ Year, data = US.top.income.shares.15, type = "b", pch = 17, col =
"blue")
abline(h = seq(0, 6, by = 2), lty = 3)
abline(v = seq(1910, 2020, by = 10), lty = 3)
legend.text.3 <- c("99.99-100%:$11,267,000 이상(2015년 기준)", "99.9-99.99%:$2,045,000-
$11,267,000")
legend(x = 1945, y = 6.95, legend = legend.text.3, pch = 17, col = c("black", "blue"))
main.title.3 <- "미국 상위 0.1% 소득 점유 분할 (1913 ~ 2015)"
title(main = main.title.3)
text(x = c(1924, 2007), y = c(6.3, 6.3), labels = c("1928", "2007"), pos = 3)
text(x = c(1935, 1965, 2015), y = c(5.6, 0.5, 3.4), label = times.label, cex = 1.5, col =
"red")
# dev.copy(png, file = "../pics/US_top_income_share_0.01-0.09_2015_kr.png", width = 960,
height = 540)
dev.off()
```
```

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### ## ggplot

#### ### Data Reshaping

`reshape2` 패키지를 이용하여 wide format 을 long format 으로 변환하고 작업

```
```{r, reshape, echo = FALSE}
library(reshape2)
data.10.df <- US.top.income.shares.15[c("Year", "P90_100")]
data.10 <- US.top.income.shares.15[c("Year", "P99_100", "P95_99", "P90_95")]
data.10.melt <- melt(data.10, id.vars = "Year", measure.vars = c("P99_100", "P95_99",
"P90_95"), variable.name = "Percentiles", value.name = "Share")
# str(data.10.melt)
data.1 <- US.top.income.shares.15[c("Year", "P99.9_100", "P99.5_99.9", "P99_99.5")]
data.1.melt <- melt(data.1, id.vars = "Year", measure.vars = c("P99.9_100", "P99.5_99.9",
"P99_99.5"), variable.name = "Percentiles", value.name = "Share")
# str(data.1.melt)
data.01 <- US.top.income.shares.15[c("Year", "P99.99_100", "P99.9_99.99")]
data.01.melt <- melt(data.01, id.vars = "Year", measure.vars = c("P99.99_100",
"P99.9_99.99"), variable.name = "Percentiles", value.name = "Share")
# str(data.01.melt)
```
```

### ### Top 10%의 소득점유(%)

```
```{r, Top 10 shares change, warning = FALSE, echo = FALSE, fig.width = 12, fig.height =
6.75}
library(ggplot2)
source("theme_kr.R")
f0 <- ggplot(data.10.df, aes(x = Year, y = P90_100)) +
  geom_line(na.rm = TRUE) +
  geom_point(shape = 24, fill = 1, size = 2, na.rm = TRUE)
# f0
f1 <- f0 +
```

```

    theme_bw()
# f1
f2 <- f1 +
    theme(panel.grid.major = element_line(linetype = "dotted", colour = "black"))
# f2
f3 <- f2 +
    scale_x_continuous(breaks = seq(1910, 2020, by = 10), limits = c(1910, 2020)) +
    scale_y_continuous(breaks = seq(30, 50, by = 5), limits = c(30, 52))
# f3
f4 <- f3 +
    theme.kr +
    xlab(x.lab) +
    ylab(y.lab)
# f4
f5 <- f4 +
    ggtitle(main.title) +
    theme(plot.title = element_text(size = 20))
f6 <- f5 +
    annotate("text", x = c(1927.5, 2007, 2012.5), y = c(50.5, 50.5, 51.5), label = c(1928,
2007, 2012))
# f6
f7 <- f6 +
    annotate("text", x = c(1935, 1965, 2015), y = c(48.5, 32, 46.5), label = times.label,
colour = "red", family = "HCR Dotum LVT", size = 8)
```

```{r, Top 10 percent share ggsave, warning = FALSE, echo = FALSE, fig.width = 12,
fig.height = 6.75}
f7
# ggsave("../pics/US_top_income_share_10_2015_ggplot_kr.png", width = 12, height = 6.75)
```

```

### Top 10%의 분할

```

```{r, Top 10 percent, warning = FALSE, echo = FALSE, fig.width = 12, fig.height = 6.75}
# source("../theme_kr.R")
library(ggplot2)
g0 <- ggplot(data.10.melt, aes(x = Year, y = Share, colour = Percentiles)) +
    geom_line(na.rm = TRUE) +
    geom_point(shape = 24, aes(fill = Percentiles), size = 2, na.rm = TRUE)
# g0
g1 <- g0 +
    theme_bw()
# g1
g2 <- g1 +
    theme(panel.grid.major = element_line(linetype = "dotted", colour = "black"))
# g2
g3 <- g2 +
    scale_x_continuous(breaks = seq(1910, 2020, by = 10), limits = c(1910, 2020)) +
    scale_y_continuous(breaks = seq(5, 25, by = 5), limits = c(5, 25))
# g3
g4 <- g3 +
    theme.kr +
    xlab(x.lab) +
    ylab(y.lab)
# g4
g5 <- g4 +
    ggtitle(main.title.1) +
    theme(plot.title = element_text(size = 20))
# g5
g6 <- g5 +
    labs(colour = "Income Fractile", fill = "Income Fractile")
# g6
g7 <- g6 +
    scale_colour_manual(name = "", values = c("black", "red", "blue"), labels =
legend.text.1) +
    scale_fill_manual(name = "", values = c("black", "red", "blue"), labels =
legend.text.1)

```

```

# g7
g8 <- g7 +
  theme(legend.position = c(0.5, 0.85))
# g8
g9 <- g8 +
  guides(colour = "none")
# g9
g10 <- g9 +
  theme(legend.title = element_blank(), legend.background = element_rect(fill = "white",
  colour = "black"))
# g10
g11 <- g10 +
  theme(legend.key = element_blank())
# g11
g12 <- g11 +
  annotate("text", x = c(1928, 2007), y = c(24.5, 24), label = c(1928, 2007))
# g12
g13 <- g12 +
  annotate("text", x = c(1935, 1960, 2015), y = c(22, 8, 18), label = times.label, colour
= "red", family = "HCR Dotum LVT", size = 8)
# annotate("text", x = c(1935, 1965, 2015), y = c(22, 8, 18), label = times.label,
colour = "red", size = 4)

...

```{r, Top 10 percent ggsave, warning = FALSE, echo = FALSE, fig.width = 12, fig.height =
6.75}
g13
ggsave("../pics/US_top_income_share_1-4-5_2015_ggplot_kr.png", width = 12, height =
6.75)
```

```

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Top 1%의 분할

```

```{r, Top 1 percent, warning = FALSE, echo = FALSE, fig.width = 12, fig.height = 6.75}
h0 <- ggplot(data.l.melt, aes(x = Year, y = Share, colour = Percentiles)) +
 geom_line(na.rm = TRUE) +
 geom_point(shape = 24, aes(fill = Percentiles), size = 2, na.rm = TRUE)
h0
h1 <- h0 +
 theme_bw()
h1
h2 <- h1 +
 theme(panel.grid.major = element_line(linetype = "dotted", colour = "black"))
h2
h3 <- h2 +
 scale_x_continuous(breaks = seq(1910, 2020, by = 10), limits = c(1910, 2020)) +
 scale_y_continuous(breaks = seq(0, 12, by = 3), limits = c(0, 13))
h3
h4 <- h3 +
 theme.kr +
 xlab(x.lab) +
 ylab(y.lab)
h4
h5 <- h4 +
 ggtitle(main.title.2) +
 theme(plot.title = element_text(size = 20))
h5
h6 <- h5 +
 labs(colour = "Income Fractile", fill = "Income Fractile")
h6
h7 <- h6 +
 scale_colour_manual(name = "", values = c("black", "red", "blue"), labels =
legend.text.2) +
 scale_fill_manual(name = "", values = c("black", "red", "blue"), labels =
legend.text.2)
h7

```

```

h8 <- h7 +
 theme(legend.position = c(0.5, 0.85))
h8
h9 <- h8 +
 guides(colour = "none")
h9
h10 <- h9 +
 theme(legend.title = element_blank(), legend.background = element_rect(fill = "white",
 colour = "black"))
h10
h11 <- h10 +
 theme(legend.key = element_blank())
h11
h12 <- h11 +
 annotate("text", x = c(1925, 2007), y = c(11.5, 12.8), label = c(1928, 2007))
h12
h13 <- h12 +
 annotate("text", x = c(1935, 1960, 2015), y = c(9, 2, 8), label = times.label, colour =
 "red", family = "HCR Dotum LVT", size = 8)
annotate("text", x = c(1935, 1965, 2015), y = c(10, 2, 8), label = times.label, colour
= "red", size = 4)
```

```{r, Top 1 percent ggsave, warning = FALSE, echo = FALSE, fig.width = 12, fig.height =
6.75}
h13
ggsave("../pics/US_top_income_share_0.1-0.4-0.5_2015_ggplot_kr.png", width = 12, height
= 6.75)
```

```

Top 0.1%의 분할

```

```{r, Top 0.1 percent, warning = FALSE, echo = FALSE, fig.width = 12, fig.height = 6.75}
j0 <- ggplot(data.01.melt, aes(x = Year, y = Share, colour = Percentiles)) +
 geom_line(na.rm = TRUE) +
 geom_point(shape = 24, aes(fill = Percentiles), size = 2, na.rm = TRUE)
j0
j1 <- j0 +
 theme_bw()
j1
j2 <- j1 +
 theme(panel.grid.major = element_line(linetype = "dotted", colour = "black"))
j2
j3 <- j2 +
 scale_x_continuous(breaks = seq(1910, 2020, by = 10), limits = c(1910, 2020)) +
 scale_y_continuous(breaks = seq(0, 6, by = 2), limits = c(0, 7))
j3
j4 <- j3 +
 theme.kr +
 xlab(x.lab) +
 ylab(y.lab)
j4
j5 <- j4 +
 ggtitle(main.title.3) +
 theme(plot.title = element_text(size = 20))
j5
j6 <- j5 +
 labs(colour = "Income Fractile", fill = "Income Fractile")
j6
j7 <- j6 +
 scale_colour_manual(name = "", values = c("black", "blue"), labels = legend.text.3) +
 scale_fill_manual(name = "", values = c("black", "blue"), labels = legend.text.3)
j7
j8 <- j7 +
 theme(legend.position = c(0.5, 0.85))
j8
j9 <- j8 +
 guides(colour = "none")
j9

```

```

j10 <- j9 +
 theme(legend.title = element_blank(), legend.background = element_rect(fill = "white",
colour = "black"))
j10
j11 <- j10 +
 theme(legend.key = element_blank())
j11
j12 <- j11 +
 annotate("text", x = c(1928, 2007), y = c(6.8, 6.5), label = c(1928, 2007))
j12
j13 <- j12 +
 annotate("text", x = c(1935, 1960, 2015), y = c(5.6, 2.8, 3.0), label = times.label,
colour = "red", family = "HCR Dotum LVT", size = 8)
annotate("text", x = c(1935, 1965, 2015), y = c(5.6, 0.5, 3.5), label = times.label,
colour = "red", size = 4)
```

```{r, Top 0.1 percent ggsave, warning = FALSE, echo = FALSE, fig.width = 12, fig.height
= 6.75}
j13
ggsave("../pics/US_top_income_share_0.01-0.09_2015_ggplot_kr.png", width = 12, height =
6.75)
```

<!--## 뒷 정리

```{r, save.image}
save.image(file = "US_top_income_shares_2015_add.rda")
```
-->

```