# Labor Market Analysis Task

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```
# Load Necessary Packages
if (!require("pacman")) install.packages("pacman")
p_load(
    "Cairo",
    "tidyverse",
    "haven",
    "ggthemes",
    "scales",
    # For working with date-times
    "lubridate",
    # Weighted Functions
    "Hmisc")
```

```
# Import Data
data <- read_dta(file = "../input/cps_wages_LFP.dta")
```

## Introduction

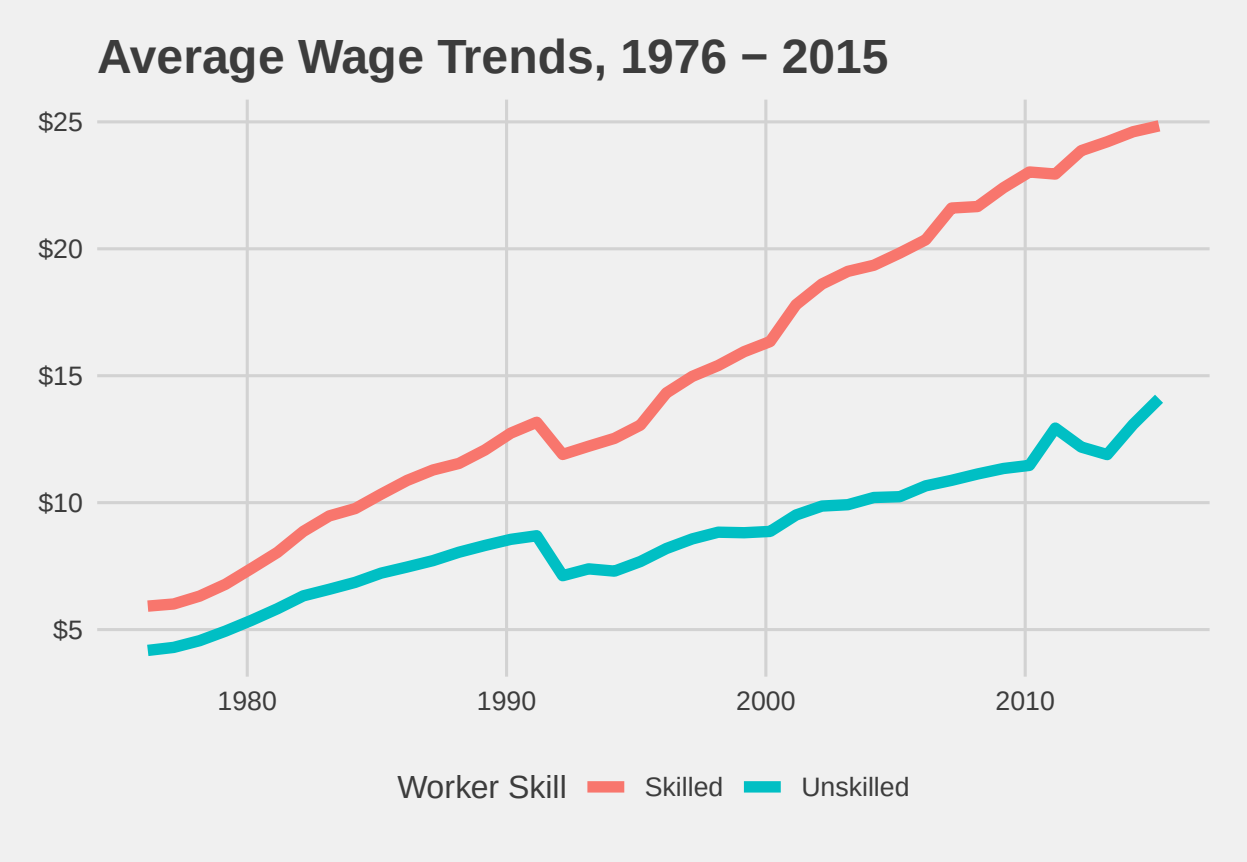
## Key Trends for Skilled and Unskilled Workers Since 1976

```
compute_trends <- function(data) {
    data %>%
    group_by(year, month) %>%
    summarise(avg_wage = wtd.mean(wage, weights = wtsupp),
              lfp = sum(wtsupp[lfp == 1 & !is.na(lfp)]) /
                    sum(wtsupp[!is.na(lfp)])
              ) %>%
    mutate(date = make_datetime(year, month))
}
trend_data <-
    # Skilled Workers
    data %>%
    filter(educ >= 73 & educ != 999) %>% # Education is high school diploma equivalent or higher.
    compute_trends() %>%
    mutate(skill = "Skilled") %>%
    # Unskilled Workers
    rbind(data %>%
          filter(educ < 73) %>% # Education is below high school diploma equivalent.
```

```
          compute_trends() %>%
          mutate(skill = "Unskilled"))
```

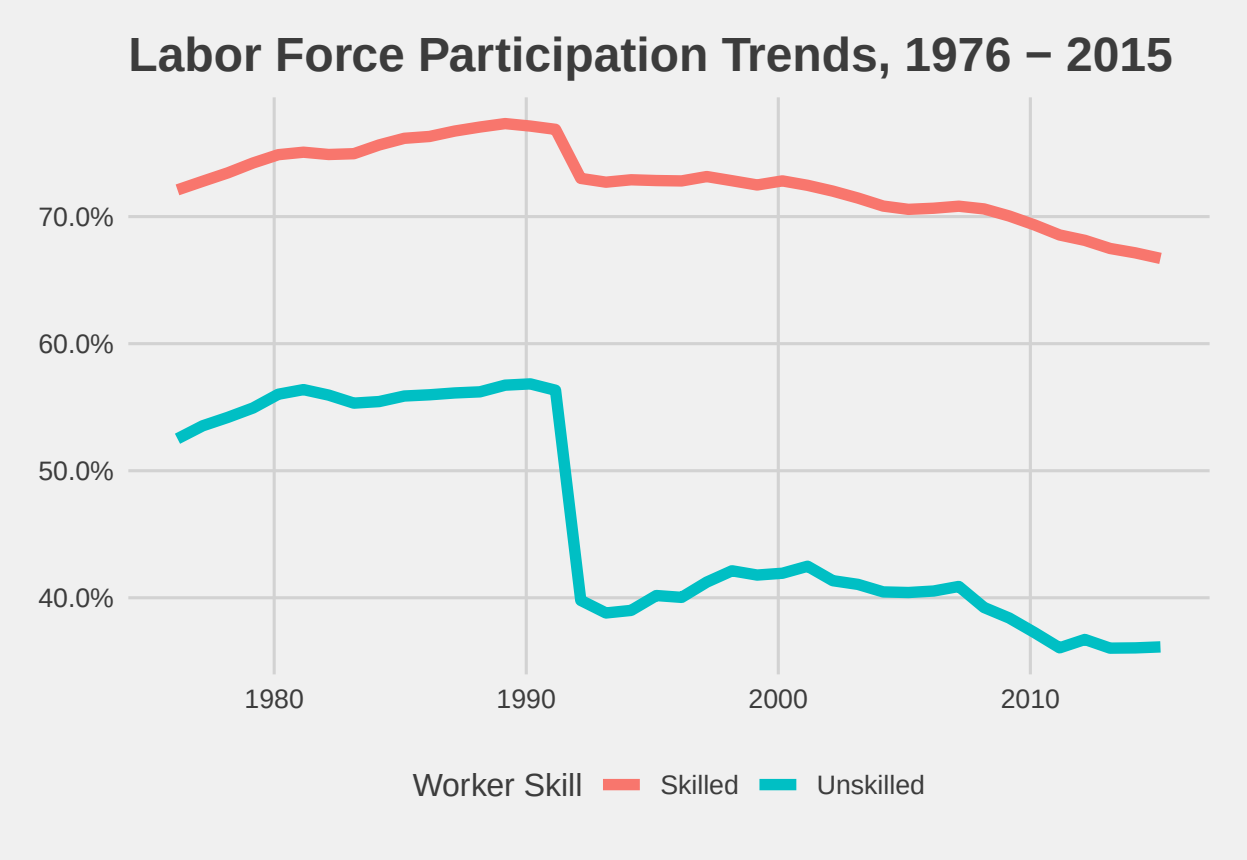
### Wage Trends

```
trend_data %>%
    ggplot(aes(x = date, y = avg_wage)) +
    geom_line(aes(color = skill, group = skill), size = 2) +
    labs(title = "Average Wage Trends, 1976 - 2015", color = "Worker Skill") +
    scale_y_continuous(labels = label_dollar()) +
    theme_fivethirtyeight()
```




### Labor Force Participation (LFP) Trends

```
trend_data %>%
    ggplot(aes(x = date, y = lfp)) +
    geom_line(aes(color = skill, group = skill), size = 2) +
    labs(title = "Labor Force Participation Trends, 1976 - 2015", color = "Worker Skill") +
    scale_y_continuous(labels = label_percent()) +
    theme_fivethirtyeight()
```

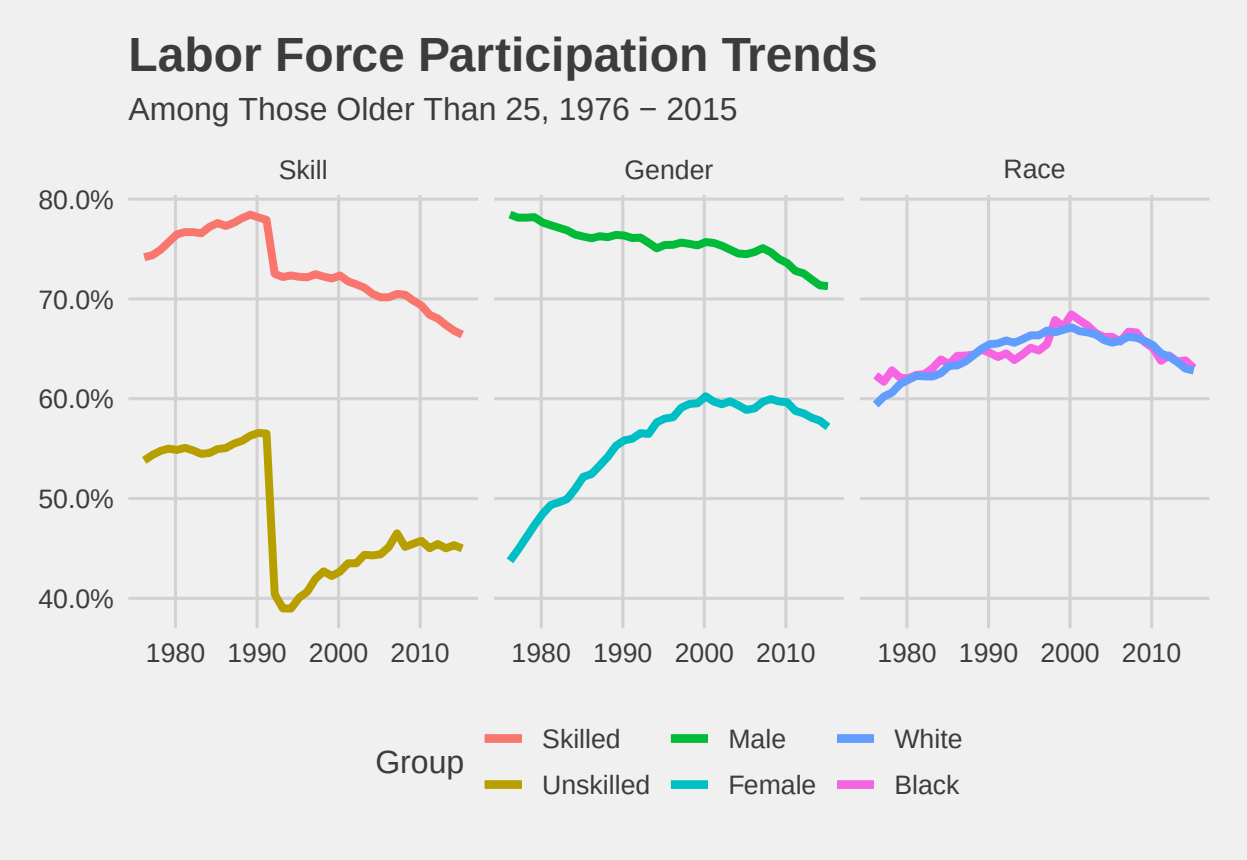



### Trends Among Men Older than 25

```
olderthan25_trend_data <-
    # Skilled Workers
    data %>%
    filter(educ >= 73 & educ != 999 & age > 25) %>%
    compute_trends() %>%
    mutate(skill = "Skilled", chart_group = 1) %>%
    # Unskilled Workers
    rbind(
        data %>%
          filter(educ < 73 & age > 25) %>%
          compute_trends() %>%
          mutate(skill = "Unskilled", chart_group = 1),
        # Male Workers
        data %>%
          filter(sex == 1 & age > 25) %>%
          compute_trends() %>%
          mutate(gender = "Male", chart_group = 2),
        # Female Workers
        data %>%
          filter(sex == 2 & age > 25) %>%
          compute_trends() %>%
          mutate(gender = "Female", chart_group = 2),
```

```
        # Non-Hispanic White Workers
        data %>%
          filter(race == 100 & hispan == 0 & age > 25) %>%
          compute_trends() %>%
          mutate(race = "White", chart_group = 3),
        # Black Workers
        data %>%
          filter(race == 200 & age > 25) %>%
          compute_trends() %>%
          mutate(race = "Black", chart_group = 3)
        ) %>%
    mutate(chart_group = factor(chart_group, labels = c("Skill", "Gender", "Race")))
```

```
olderthan25_trend_data %>%
    ggplot(aes(x = date, y = lfp)) +
    geom_line(data = ~ filter(.x, !is.na(skill)),
              aes(color = skill, group = skill), size = 1.4) +
    geom_line(data = ~ filter(.x, !is.na(gender)),
              aes(color = gender, group = gender), size = 1.4) +
    geom_line(data = ~ filter(.x, !is.na(race)),
              aes(color = race, group = race), size = 1.4) +
    labs(title = "Labor Force Participation Trends",
         subtitle = "Among Those Older Than 25, 1976 - 2015",
         color = "Group") +
    scale_y_continuous(labels = label_percent()) +
    scale_color_discrete(limits = c("Skilled", "Unskilled", "Male", "Female",
                                    "White", "Black")) +
    theme_fivethirtyeight() +
    facet_wrap(~chart_group, labeller = "label_parsed")
```


Labor Force Participation Trends
Among Those Older Than 25, 1976 − 2015
Skill
Gender
Race
80.0%
70.0%
60.0%
50.0%
40.0%
1980
1990
2000
2010
Group
Skilled
Unskilled
Male
Female
White
Black

## Discussion