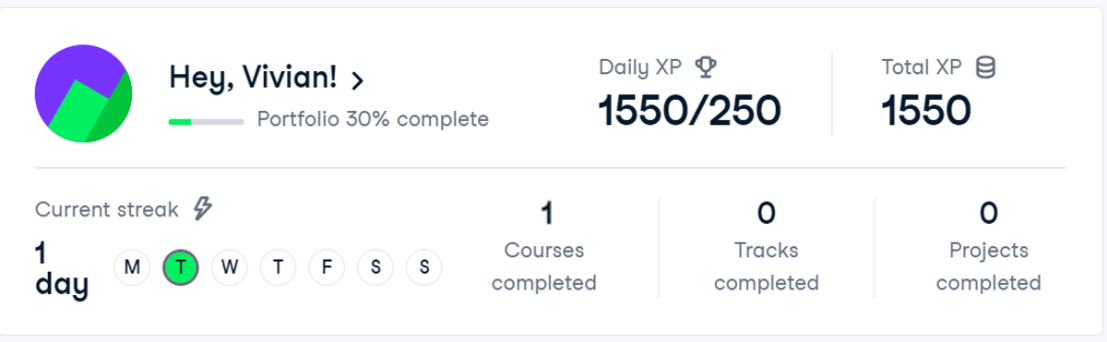
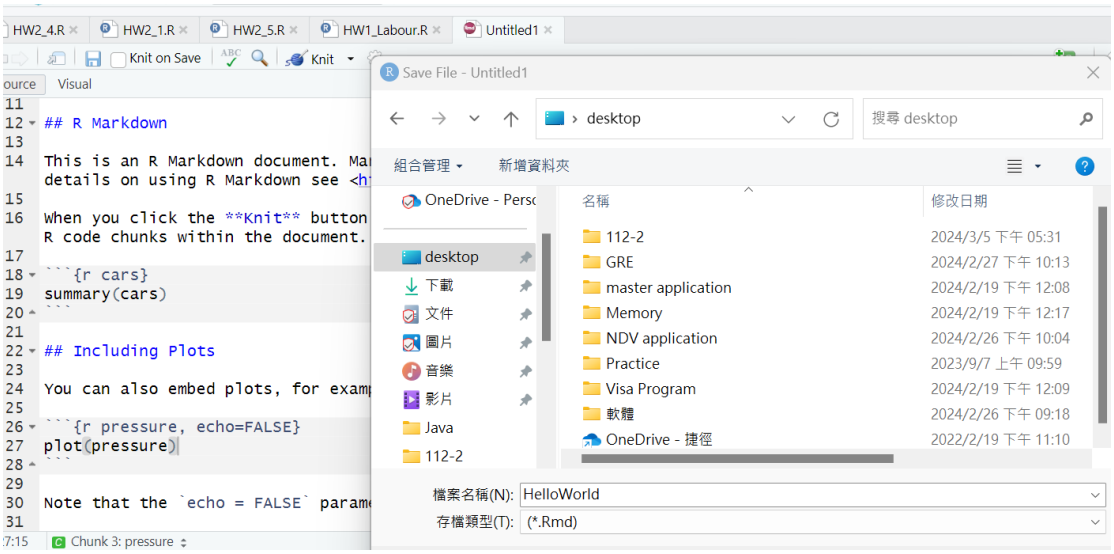
1. Setup

   i. Log in & Finish Arbitrary Courses



   ii. Generate RMarkdown files and knit



2. Sign up NBER working paper series

   i.

War Bonds, Postwar Inflation, and Voter Sentiment

ARTICLE

During World War II, the US government, under Democratic Party leadership, encouraged citizens to invest in savings bonds, and over 85 million Americans subscribed. But high post-war inflation diminished the value of these bonds. The Republican Party criticized Democrats for the poor returns earned by bondholders. Running on a platform that promised to control inflation, the Republicans won the presidency in 1952, ending two decades of Democratic dominance. In Inflation, War Bonds, and the Rise of Republicans in the 1950s (NBER Working Paper 31969), researchers Gillian Brunet, Eric Hilt, and Matthew S. Jaremski examine how ownership of war bonds affected the presidential elections of the 1950s.

In May 1941, the federal government began selling “E bonds” to finance WWII. Bond drives supported by celebrities, government officials, and civil society organizations boosted sales, as did major events like the bombing of Pearl Harbor ...

3. Sign up SRDA

i.

ii.

4. Roy Model

i.

```
library(data.table)

N <- 10000000
miu0 <- 20
miu1 <- 25

# 4.2.2 smiulate N = 10m e0, e1
sim_data <- data.table(
  epsilon0 = rnorm(N),
  epsilon1 = rnorm(N),
  Immigrant = sample(c(0, 1), N, replace = TRUE)  # Adding a binary Immigrant variable
)
```

ii.

```
# 4.2.3 create w0 w1
sim_data[, w0 := miu0 + epsilon0]
sim_data[, w1 := miu1 + epsilon1]
```

iii.

```
# 4.2.4 generate column I
sim_data[, I := as.integer(w0 > w1)]
```

iv.

```
# 4.2.5 calculate with no formula
E_w0_Immigrant <- mean(sim_data[Immigrant == 1, w0])
E_w1_Immigrant <- mean(sim_data[Immigrant == 1, w1])
E_e0_Immigrant <- mean(sim_data[Immigrant == 1, epsilon0])
E_e1_Immigrant <- mean(sim_data[Immigrant == 1, epsilon1])

print("E[w0|I]: ")
print(E_w0_Immigrant)
print("E[w1|I]: ")
print(E_w1_Immigrant)
print("E[e0|I]: ")
print(E_e0_Immigrant)
print("E[e1|I]: ")
print(E_e1_Immigrant)
```

v.

```
> print("E[w0|I]: ")
[1] "E[w0|I]: "
> print(E_w0_Immigrant)
[1] 20.00067
> print("E[w1|I]: ")
[1] "E[w1|I]: "
> print(E_w1_Immigrant)
[1] 25.00016
> print("E[e0|I]: ")
[1] "E[e0|I]: "
> print(E_e0_Immigrant)
[1] 0.0006712976
> print("E[e1|I]: ")
[1] "E[e1|I]: "
> print(E_e1_Immigrant)
[1] 0.0001643597
```

vi.

```
# 4.2.6 calculate with formula
rho <- cor(sim_data$epsilon0, sim_data$epsilon1)
sigma_nu <- sqrt(var(sim_data$epsilon0) * var(sim_data$epsilon1))
z <- qnorm(mean(sim_data$Immigrant))
calculated_E_w0 <- miu0 +
  sqrt(var(sim_data$w0)) * sqrt(var(sim_data$w1)) *
  (rho - sqrt(var(sim_data$epsilon0)) / sqrt(var(sim_data$epsilon1))) / sigma_nu *
  (dnorm(z) / (1 - pnorm(z)))

calculated_E_w1 <- miu1 +
  sqrt(var(sim_data$w1)) * sqrt(var(sim_data$w0)) *
  (sqrt(var(sim_data$epsilon1) - rho) / sqrt(var(sim_data$epsilon0))) / sigma_nu *
  (dnorm(z) / (1 - pnorm(z)))
```

vii.

```
> # 4.2.6 compare
> print("E[w0|I]_cal: ")
[1] "E[w0|I]_cal: "
> print(calculated_E_w0)
[1] 19.20139
> print("E[w0|I]_no_cal: ")
[1] "E[w0|I]_no_cal: "
> print(E_w0_Immigrant)
[1] 20.00067
>
> print("E[w1|I]_cal: ")
[1] "E[w1|I]_cal: "
> print(calculated_E_w1)
[1] 25.79766
> print("E[w1|I]_no_cal: ")
[1] "E[w1|I]_no_cal: "
> print(E_w1_Immigrant)
[1] 25.00016
>
> print("E[e0|I]_cal: ")
[1] "E[e0|I]_cal: "
> print(calculated_E_w0 - mean(sim_data[Immigrant == 1, w0]) )
[1] -0.7992783
> print("E[e0|I]_no_cal: ")
[1] "E[e0|I]_no_cal: "
> print(E_e0_Immigrant)
[1] 0.0006712976
```

viii.

```
> print("E[e1|I]_cal: ")
[1] "E[e1|I]_cal: "
> print(calculated_E_w1 - mean(sim_data[Immigrant == 1, w1]) )
[1] 0.7974987
> print("E[e1|I]_no_cal: ")
[1] "E[e1|I]_no_cal: "
> print(E_e1_Immigrant)
[1] 0.0001643597
```

ix.

```
# 4.2.7
## the "indiviual income if that person stay" for they stay
## the "individual income if that person immigrate" for they immigrate
## we don't know what would the "immmigrate income" for those stay and otherwise
```

5. Roy Model Example
6. Individuals decide whether to start their own businesses or work for established firms based on factors such as risk tolerance, skillsets, and market opportunities.

   For example, starting a businesses has a lower average income and larger variance, work for established firms enjoys a higher average income but smaller variance, a person who is on the lower scale would work for established firms, like most of the people, but there are also people starting their own business and be successful. Also the fact that we could not simply decided our career choices merely by the average income, because our talent in which kind of jobs could also matter.

   In this case, we can assume that w0 represents the income where people works for established firms, and w1 represents the income where people starting their own business. In today's world where people working for established firms is a norm, people would have to have incentives to start up business. And the conditions for it is that the increased earnings by changing career would have to at least cover the cost C of starting business.