Empirical Workshop 1

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library(rio)  
library(tidyverse)

## ── Attaching packages ──────────────────────────── tidyverse 1.2.1 ──

## ✔ ggplot2 3.1.0 ✔ purrr 0.2.5   
## ✔ tibble 2.0.1 ✔ dplyr 0.8.0.1  
## ✔ tidyr 0.8.2 ✔ stringr 1.3.1   
## ✔ readr 1.3.1 ✔ forcats 0.3.0

## ── Conflicts ─────────────────────────────── tidyverse\_conflicts() ──  
## ✖ dplyr::filter() masks stats::filter()  
## ✖ dplyr::lag() masks stats::lag()

df <- import("dutch\_coffee.dta")

df %>% head()

## maand year month qu cprice tprice incom q1 q2 q3 q4 bprice wprice  
## 1 29 1990 1 0.55 12.12 18.6 1640.87 1 0 0 0 3.47 28.15  
## 2 22 1990 2 0.65 12.12 18.6 1538.60 1 0 0 0 3.40 28.15  
## 3 50 1990 3 0.66 12.12 18.6 1680.93 1 0 0 0 3.26 28.33  
## 4 1 1990 4 0.66 12.12 18.6 1656.20 0 1 0 0 3.46 28.49  
## 5 57 1990 5 0.64 12.12 18.6 1700.80 0 1 0 0 3.47 28.55  
## 6 43 1990 6 0.65 12.12 18.6 1732.67 0 1 0 0 3.68 28.55  
## oprice  
## 1 1  
## 2 1  
## 3 1  
## 4 1  
## 5 1  
## 6 1

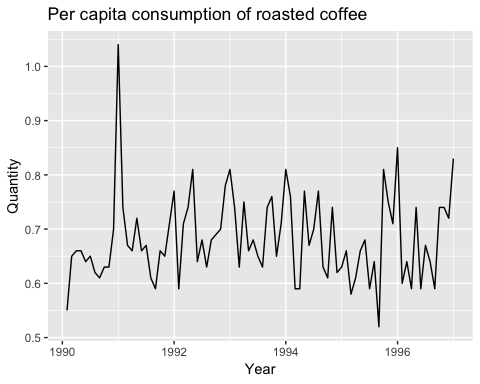
# Create time variable  
df <- df %>% mutate(time = year + month/12)

## Summary statistics

Present and discuss summary statistics of the data. Show and describe the following relationships: (a) per capita consumption of roasted coffee and the price of roasted coffee, (b) consumption of roasted coffee and price of tea, (c) price of roasted coffee and price of labor, (d) price of roasted coffee and price of tea. Comment if you observe any clear time trends.

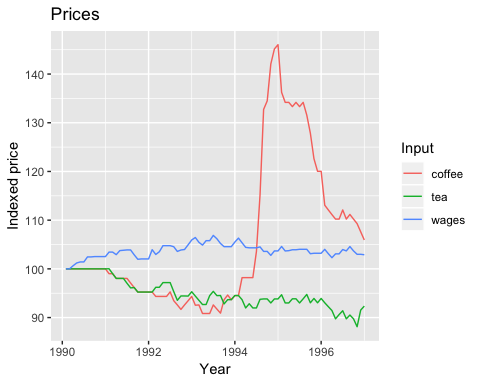
### Per capita consumption of roasted coffe and price of roasted coffee

# descriptives are important!  
# Plot all the time series in separate graphs  
# a) per capita consumption of roasted coffee and price of roasted coffee  
df %>% ggplot(aes(x = time, y = qu)) +  
 geom\_line() +  
 labs(y = "Quantity", x = "Year", title = "Per capita consumption of roasted coffee")



df <- df %>% mutate(coffee = cprice/cprice[1]\*100,  
 tea = tprice/tprice[1]\*100,  
 wages = wprice/wprice[1]\*100)   
  
df %>% gather(coffee, tea, wages, key = "Input", value = "price") %>%   
 ggplot(aes(x = time, y = price, color = Input)) +  
 geom\_line() +  
 labs(y = "Indexed price", x = "Year", title = "Prices")

## Warning: attributes are not identical across measure variables;  
## they will be dropped



# consumption of roasted coffee and price of tea  
df %>% ggplot(aes(x = time, y = tprice)) +  
 geom\_line() +  
 labs(y = "Price", x = "Year", title = "Price of tea")



# price of roasted coffee and price of labor  
df %>% ggplot(aes(x = time, y = wprice)) +  
 geom\_line() +  
 labs(y = "Price", x = "Year", title = "Wages over time")



# price of roasted coffee and price of tea

## Supply and demand shifts

Start from the data that we have.

## Log linear demand estimation

$\beta\_1 = \frac{dQ}{dP}\frac{P}$

## One major concern

## Degree of competition

## Conduct parameter