

# Lesson-7—30.05.2023.R

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```
rm(list = ls())
```

```
library(here)
```

```
## here() starts at C:/Users/bramu/OneDrive/Dokumente/Data-visualisation-with-R
```

```
library(dplyr)
```

```
##
```

```
## Attache Paket: 'dplyr'
```

```
## Die folgenden Objekte sind maskiert von 'package:stats':
```

```
##
```

```
##      filter, lag
```

```
## Die folgenden Objekte sind maskiert von 'package:base':
```

```
##
```

```
##      intersect, setdiff, setequal, union
```

```
library(tidyr)
```

```
library(ggplot2)
```

```
library(rdbnomics)
```

```
## Visit <https://db.nomics.world>.
```

```
source(here("Lesson 7 - 30.05.2023/functions.r"))
```

```
country_code <- c("D_W", "DEU", "FRA", "ITA", "NLD", "ESP", "USA")
```

```
countries <- paste0("AMECO/OVGD/", country_code, ".1.1.0.0.OVGD")
```

```
df_rgdp <- rdb(ids = countries) %>%
```

```
  filter_function() %>%
```

```
  germany_function()
```

```
df_unemp <- readRDS(here("Lesson 6. - 23.05.2023/df_final.rds"))
```

```
df_final <- df_rgdp %>%
```

```
  inner_join(df_unemp, by = c("Country", "Year")) %>%
```

```

rename(rgdp = value.x,
       unemp = value.y) %>%
relocate(Year, Country, rgdp, unemp) %>%
group_by(Country) %>%
mutate(dunemp = c(NA, diff(unemp)),
       rgdp_gr = round(c(NA, diff(rgdp))/lag(rgdp) * 100, digits = 2)) %>%
drop_na()

cols <- c("Germany" = "blue",
          "Spain" = "red",
          "France" = "green",
          "United States" = "orange",
          "Italy" = "black",
          "Netherlands" = "purple")

p1 <- ggplot(df_final, aes(y = rgdp_gr,
                          x = Year,
                          group = Country,
                          color = Country)) +

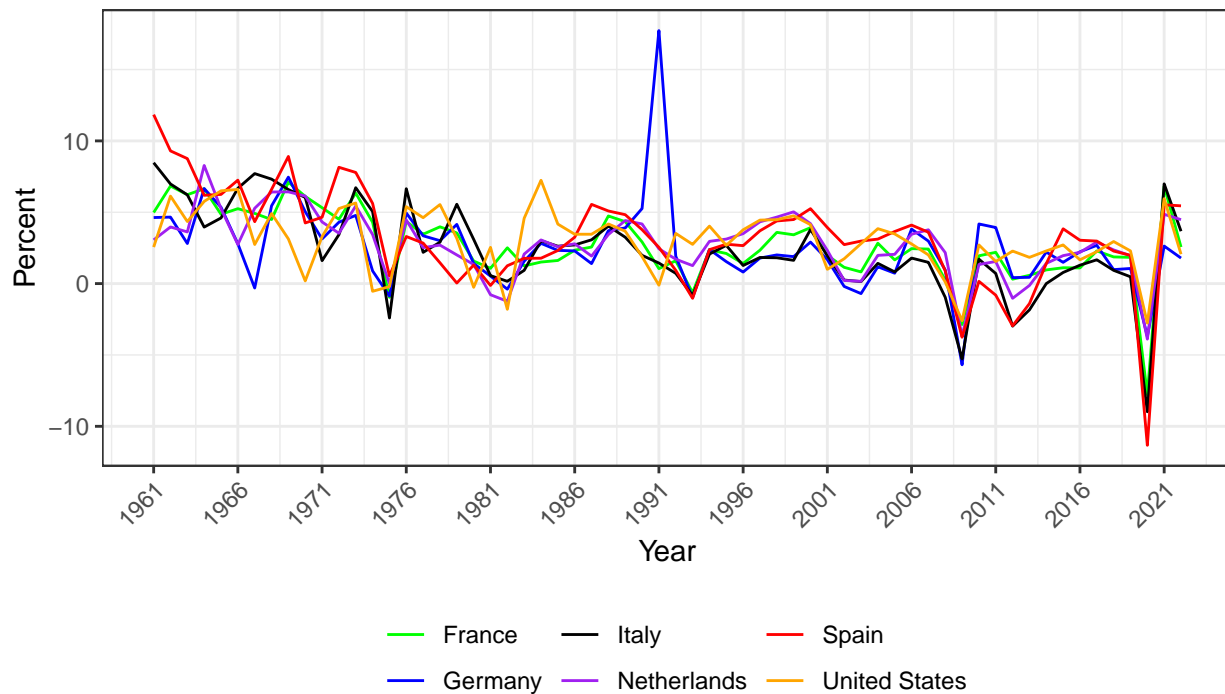
geom_line() +
theme_bw() +
scale_color_manual(values = cols) +
theme(legend.position = "bottom") +
labs(color = NULL,
     y = "Percent",
     title = paste0("Gross domestic product,", min(df_final$Year), "-", max(df_final$Year)),
     subtitle = "2015 reference levels (OVGD)",
     caption = "Source: AMECO data from dbnomics.") +
theme(axis.text.x = element_text(angle = 45,
                                  hjust = 1)) +
scale_x_continuous(breaks = seq(min(df_final$Year), max(df_final$Year), 5))

p1

```

## Gross domestic product, 1961–2022

### 2015 reference levels (OVGD)



Source: AMECO data from dbnomics.

```
df_final_modified <- df_final %>%
  filter(!(Year %in% c(1991, 2020:2022)))

# saveRDS(df_final_modified, file = "Lesson 7 - 30.05.2023/df_final_modified.rds")

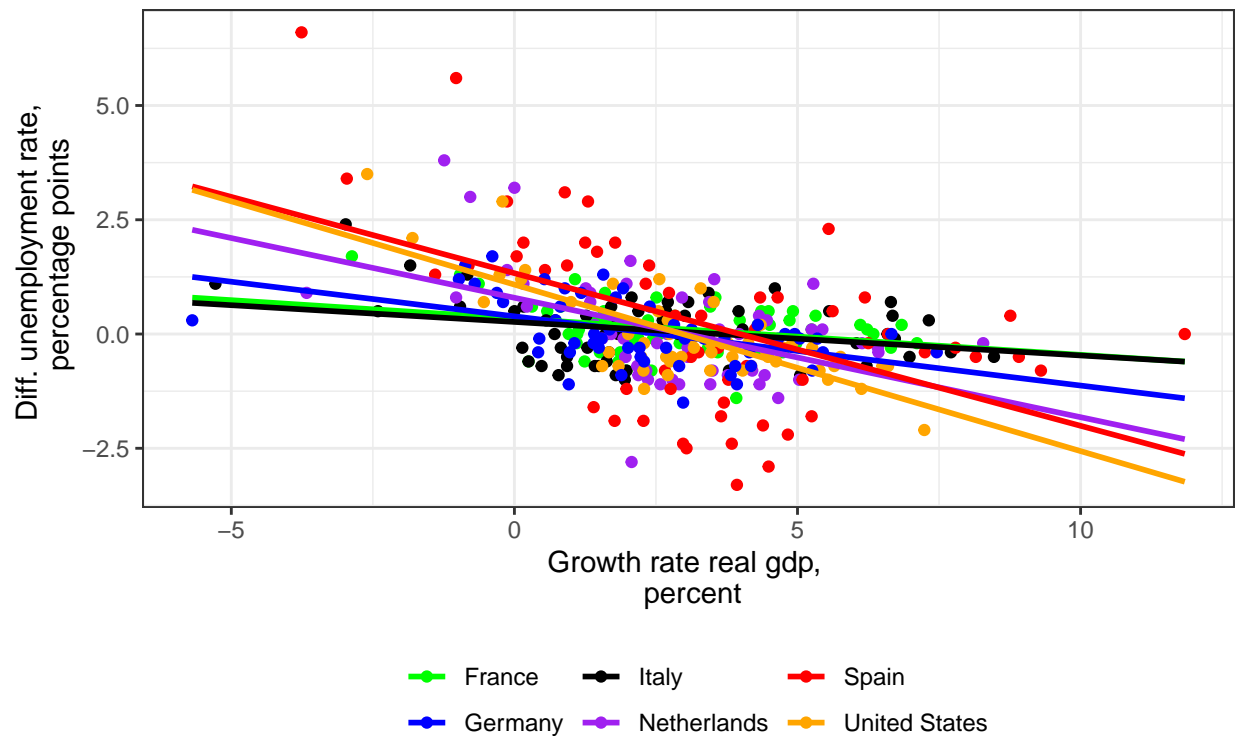
p2 <- ggplot(df_final_modified, aes(x = rgdp_gr,
                                   y = dunemp,
                                   group = Country,
                                   color = Country)) +

  geom_point() +
  theme_bw() +
  geom_smooth(method = lm,
              se = FALSE,
              fullrange = TRUE) +
  scale_color_manual(values = cols) +
  theme(legend.position = "bottom") +
  labs(color = NULL,
       y = "Diff. unemployment rate, \n percentage points",
       x = "Growth rate real gdp, \n percent",
       title = paste0("Okun's law,", min(df_final$Year), "-", max(df_final$Year)),
       caption = "Source: AMECO data from dbnomics.")
```

p2

```
## 'geom_smooth()' using formula = 'y ~ x'
```

## Okun's law, 1961–2022



Source: AMECO data from dbnomics.

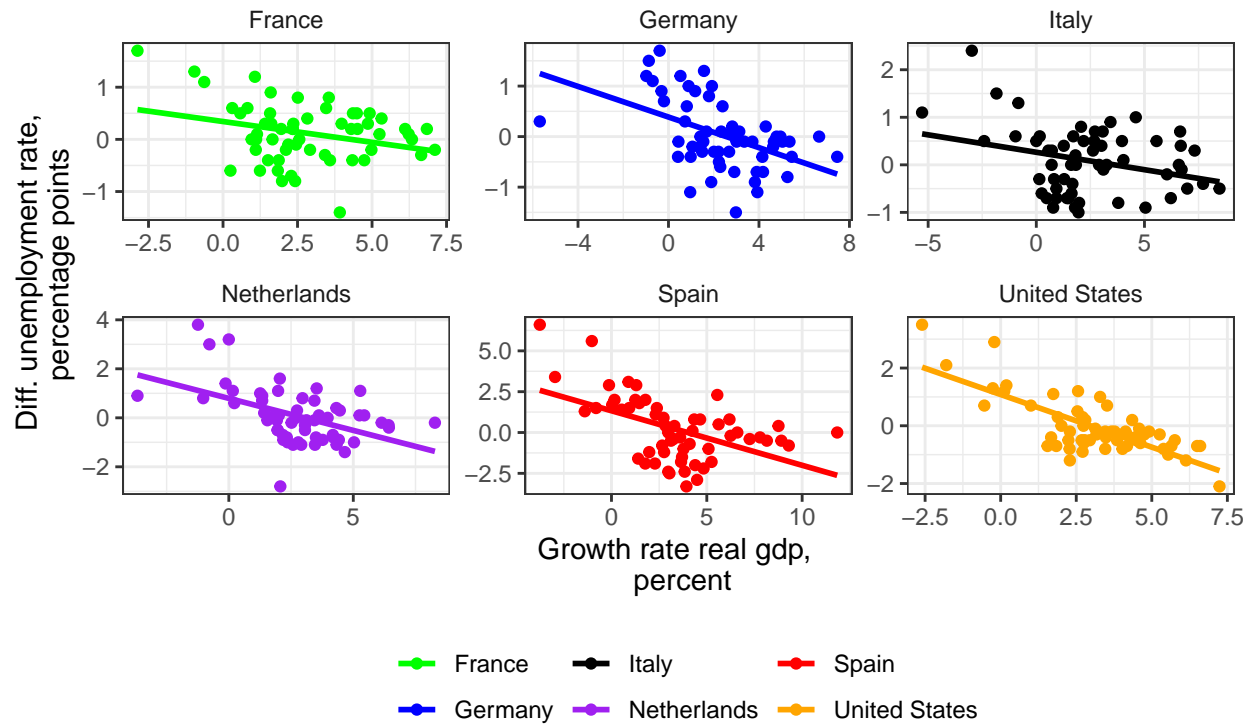
```
p3 <- ggplot(df_final_modified, aes(x = rgdp_gr,
                                   y = dunemp,
                                   group = Country,
                                   color = Country)) +

  geom_point() +
  theme_bw() +
  geom_smooth(method = lm,
             se = FALSE,
             fullrange = TRUE) +
  scale_color_manual(values = cols) +
  facet_wrap(~Country,
            nrow = 2,
            strip.position = "top",
            scales = "free") +
  theme(legend.position = "bottom",
        strip.background = element_blank(),
        strip.placement = "outside") +
  labs(color = NULL,
       y = "Diff. unemployment rate, \n percentage points",
       x = "Growth rate real gdp, \n percent",
       title = paste0("Okun's law,", min(df_final$Year), "-", max(df_final$Year)),
       caption = "Source: AMECO data from dbnomics.")
```

p3

```
## 'geom_smooth()' using formula = 'y ~ x'
```

## Okun's law, 1961–2022



Source: AMECO data from dbnomics.