

Growth contributions

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```
library(dplyr)
library(tidyr)
library(ggplot2)
library(rdbnomics)
```

Growth contributions

In this exercise, we want to apply one of the methods used in the literature on demand and growth regimes. Specifically, we want to calculate growth contributions for the case of Germany from 2001 to 2019.

$$Y_t = C_t + G_t + I_t + NX_t$$

$$\Delta Y_t = \Delta C_t + \Delta G_t + \Delta I_t + \Delta NX_t$$

$$\frac{\Delta Y_t}{Y_{t-1}} = \frac{\Delta C_t}{Y_{t-1}} + \frac{\Delta G_t}{Y_{t-1}} + \frac{\Delta I_t}{Y_{t-1}} + \frac{\Delta NX_t}{Y_{t-1}}$$

Pulling and filtering data

```
# Function to pull and filter data from DBnomics ----
filter_function <- function(x, y = "var_level_name", z = "var_gr_name") {

  df_x <- rdb(ids = x) %>%
    select("Country",
           "original_period",
           "value") %>%
    rename(Year = original_period) %>%
    filter(Year >= 2000 & Year <= 2019) %>%
    mutate(var_gr = c(NA, diff(value))/lag(value) * 100) %>%
    select(Year, value, var_gr)

  colnames(df_x) <- c("Year", y, z)

  return(df_x)
}

# Gross domestic product at 2015 reference levels ----
df_realGDP <- filter_function(x = "AMECO/OVGD/DEU.1.1.0.0.OVGD",
                             y = "realGDP_level",
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      z = "realGDP_gr")

# Gross capital formation at 2015 prices: total economy ----
df_capfor <- filter_function(x = "AMECO/OITT/DEU.1.1.0.0.OITT",
      y = "Investment_level",
      z = "Investment_gr")

# Private final consumption expenditure at 2015 prices ----
df_privcons <- filter_function(x = "AMECO/OCPH/DEU.1.1.0.0.OCPH",
      y = "Consumption_level",
      z = "Consumption_gr")

# Final consumption expenditure of general government at 2015 prices ----
df_govcons <- filter_function(x = "AMECO/OCTG/DEU.1.1.0.0.OCTG",
      y = "Gvt_spending_level",
      z = "Gvt_spending_gr")

# Exports of goods and services at 2015 prices ----
df_exp <- filter_function(x = "AMECO/OXGS/DEU.1.1.0.0.OXGS",
      y = "Export_level",
      z = "Export_gr")

# Imports of goods and services at 2015 prices ----
df_imp <- filter_function(x = "AMECO/OMGS/DEU.1.1.0.0.OMGS",
      y = "Import_level",
      z = "Import_gr")

```

Calculation of growth contributions

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# Putting data together and calculating the additional variables ----
df <- df_realGDP %>%
  full_join(df_capfor, by = "Year") %>%
  full_join(df_privcons, by = "Year") %>%
  full_join(df_govcons, by = "Year") %>%
  full_join(df_imp, by = "Year") %>%
  full_join(df_exp, by = "Year") %>%
  mutate(rGDPllevel_calc = Investment_level +
    Consumption_level + Gvt_spending_level + Export_level - Import_level,
    rGDPcalculated_gr = c(NA, diff(rGDPllevel_calc)/lag(rGDPllevel_calc) * 100,
    Inv_gr_contr = Investment_gr * lag(Investment_level) / lag(rGDPllevel_calc),
    Cons_gr_contr = Consumption_gr * lag(Consumption_level) / lag(rGDPllevel_calc),
    Gvt_spending_gr_contr = Gvt_spending_gr * lag(Gvt_spending_level) / lag(rGDPllevel_calc),
    Export_gr_contr = Export_gr * lag(Export_level) / lag(rGDPllevel_calc),
    Import_gr_contr = (-1) * Import_gr * lag(Import_level) / lag(rGDPllevel_calc),
    Net_export_level = Export_level - Import_level,
    Net_export_gr_contr = Export_gr_contr + Import_gr_contr)

```

The growth contributions graph

```

# Preparing data for the graph ----
# Growth contribution

```

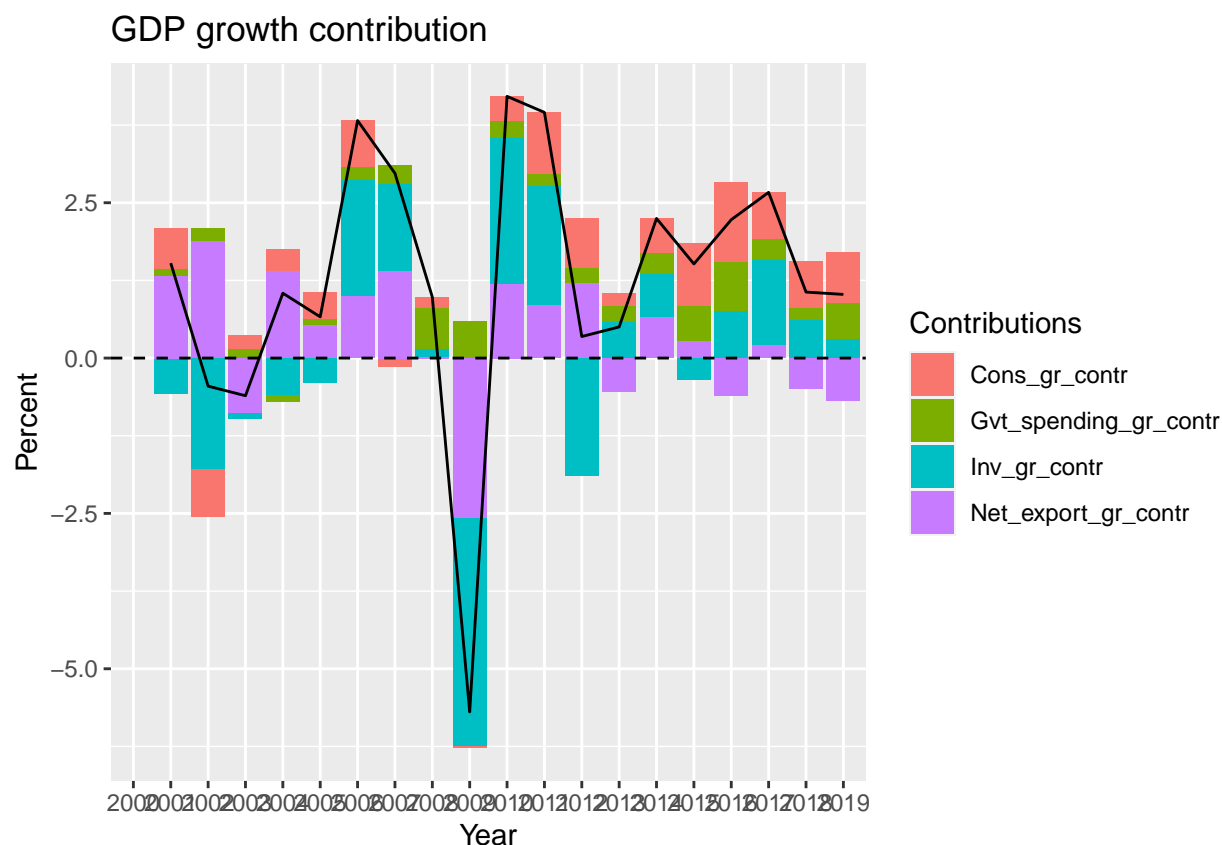
```

df_graph <- df %>%
  select(Year,
         Cons_gr_contr,
         Gvt_spending_gr_contr,
         Inv_gr_contr,
         Net_export_gr_contr) %>%
  pivot_longer(!Year, names_to = "Contributions", values_to = "value")

# Real GDP growth
df_graph2 <- df %>%
  select(Year, rGDPcalculated_gr) %>%
  pivot_longer(!Year, names_to = "Contributions", values_to = "value")

# Plot ----
p <- ggplot() +
  geom_bar(data = df_graph, aes(x = Year,
                                y = value,
                                fill = Contributions),
           stat = "identity") +
  geom_line(data = df_graph2, aes(x = Year,
                                   y = value,
                                   group = 1)) +
  geom_hline(yintercept = 0,
             linetype = "dashed",
             color = "black") +
  labs(title = "GDP growth contribution",
       x = "Year",
       y = "Percent")
p

```



Exercise

Calculate the following values for Germany (for the periods 2001–2009 and 2010–2019) and compare them with the values in Table 1 of Hein and Martschin (2021).¹

- Average real GDP growth
- Average growth contribution of (private) consumption
- Average growth contribution of government consumption
- Average growth contribution of gross fixed capital formation
- Average growth contribution of net exports
- Average net exports of goods and services as a share of GDP

Report your results in a single R markdown document printed as HTML or PDF file. **Tip:** Use the *dplyr* package for data analysis and the *kableExtra* package to create a well formatted table.

¹Hein E. and Martschin, J. (2021), Demand and growth regimes in finance-dominated capitalism and the role of the macroeconomic policy regime: a post-Keynesian comparative study on France, Germany, Italy and Spain before and after the Great Financial Crisis and the Great Recession, 2, pp. 493–527. The paper can be found [here](#).