

## Problem Set #1

due Wednesday October 15, 2025 at 11h00

### Part I (15 points): Multiple Choice

1. (5 points) A Swiss company sells materials to a German company, which will use them as an intermediate input for its production. These materials are
  - a) In Swiss imports and in Swiss GDP
  - b) In Swiss exports and in Swiss GDP
  - c) In Swiss exports but not in Swiss GDP
  - d) Not in Swiss GDP
2. (5 points) Unemployment benefits:
  - a) Are part of GDP
  - b) Are part of Government spending and therefore of GDP
  - c) Contribute to the primary surplus/deficit
3. (5 points) In a closed economy, which of the following is true
  - a) There is always a deficit in the current account
  - b) Investment matches the savings of the economy
  - c) The government deficit matches the savings of the households
  - d) Investment matches the current account

### Part II (32 points): Procyclicality of Swiss Gross Fixed Capital Formation

Please download quarterly data on Swiss Gross Domestic Product from SECO, GDP and expenditure-side components, not adjusted (XLSX, 620 kB, 28.08.2025); please consider real data in the worksheet real\_q.

1. (8 points) Plot the annual rate of growth (these are in blue in the column to the right of the Mio Swiss Franc value) of a) Construction; b) Fixed assets and software; c) Gross Domestic Product; for the period 1981Q1 to the latest data available. Please include the graph in your problem set.
2. (8 points) Calculate the rate of correlation between the annual rate of growth of: a) GDP and Construction; b) GDP and Fixed assets and software. A positive correlation with GDP implies procyclicality. Which, among Construction and Fixed assets and software, is more procyclical? Can you think of one, max two, reasons?

3. (8 points) Calculate the standard deviation of the annual growth of GDP, Construction and Fixed assets and software. Which variable has the largest volatility? Can you think of one, max two, reasons?
4. (8 points) Look at the graph with the annual growth rate of GDP, Construction and Fixed assets and software. Have all variables rebounded since the Covid-19 pandemic?

### **Part III (30 points): Twin Deficit Hypothesis**

The twin deficit hypothesis says that fiscal deficits and current account deficits go hand in hand.

1. (5 points) Using definitions of national savings and current account, express the current account as a function of the government savings  $S^g$ , private savings  $S^p$ , and investment  $I$ .
2. (5 points) Explain the rationale behind the hypothesis. Is there an implicit assumption about the private sector balance? (Hint: Define 'private asset position' as private savings minus investment  $S^p - I$ . How should this behave?)
3. (10 points) Graph the US government budget balance and current account balance from 1960 to 2024. Does the data support the hypothesis? What can you say before and after the 1990s? (Hint: Compute the correlation between  $CA$  and  $S^g$  before the 1990s and after the 1990s) (Data: Look for '*Balance on Current Account, NIPA's, Billions of Dollars, Annual*' and '*Federal Surplus or Deficit [-] Millions of Dollars, Annual, Not Seasonally Adjusted*' from 1960 to 2024 at the St. Louis FED databank)
4. (10 points) Let's continue the analysis from question 3. Why do you believe the hypothesis strengthen/weaken after 1990? Graph the private savings and investment series in the US from 1960 to 2024. (Hint: Compute the ratio between nominal private savings and nominal GDP and the ratio between nominal investment and nominal GDP and explain their differences across time) (Data: Look for '*Net private saving: Households and institutions, Billions of Dollars, Annual*', '*Gross Private Domestic Investment, Billions of Dollars, Annual*', and '*Gross Domestic Product, Billions of Dollars, Annual*' from 1960 to 2024 at the St. Louis FED databank)