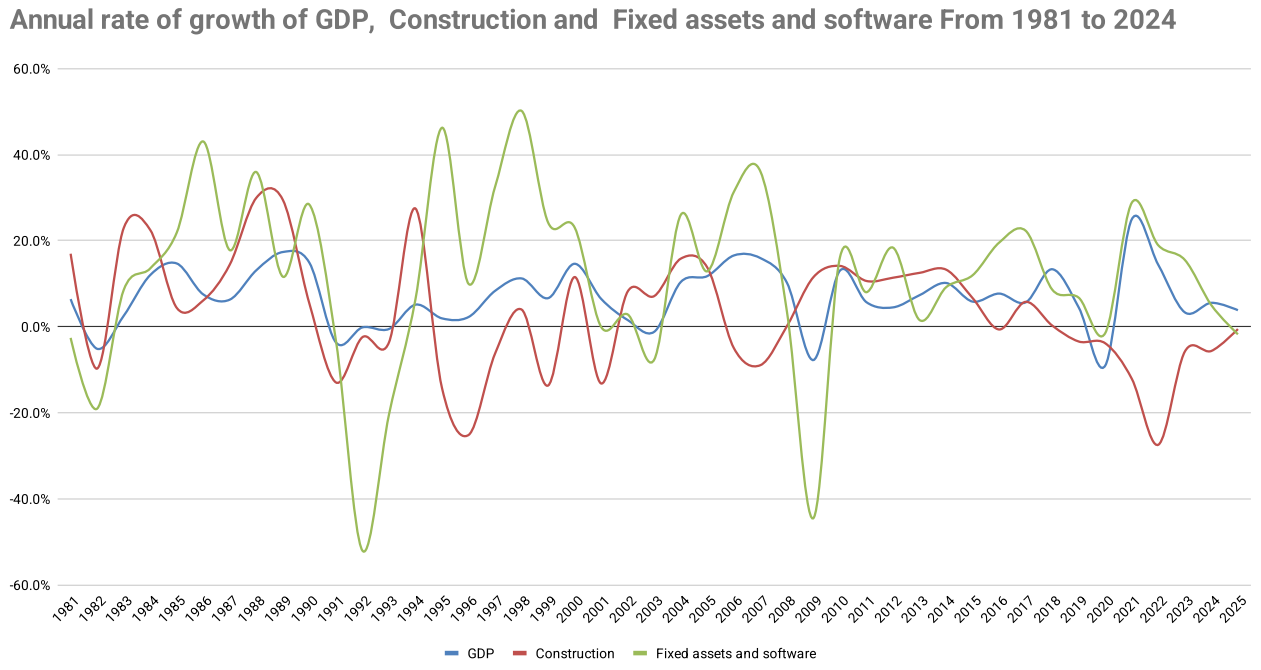
Problem Set 1 - Quintavalle Pietro

Part 1

1. These materials are **in Swiss exports and in Swiss GDP**
2. Unemployment benefits **Contribute to the primary surplus/deficit**
3. In a closed economy **Investment matches the savings of the economy**

Part 2



Annual rate of growth of GDP, Construction and Fixed assets and software From 1981 to 2024.svg

2. The rate of correlation between GDP and Construction is 0.16 and the one between GDP and Fixed assets and software is 0.60, meaning that Fixed Assets & Software is more procyclical. The two possible reasons could be these:
   - Construction projects can be easily postponed during recessions and accelerated during booms
   - Fixed assets include diverse categories (machinery, equipment, software) with varying replacement cycles, smoothing the aggregate behavior
3. From the table below we can see that there is a higher volatility with the Fixed Assets and Software, this is due to how Investment responds disproportionately to changes in output small changes in expected demand can trigger large changes in investment spending. Additionally capital expenditures are often large, discrete projects that create volatility, whereas GDP includes smoother consumption components that dampen overall volatility.

STDEV GDP	STDEV Construction	STDEV Fixed Assets and Software
0.020	0.040	0.056

4. No not all variables have rebounded, the Construction variable is still in the negative unlike the GDP and Fixed Assets & Software. This could explain the trend of the increase in housing prices in the last 5 years in the Swiss territory too.

Part 3

Question 1

$$Y = C + I + G + (X - M)$$

Where $CA = X - M$ (current account)

National savings:

$$S = Y - C - G = S_p + S_g$$

Where:

- $S_p = Y - T - C$ (private savings)
- $S_g = T - G$ (government savings)

Rearranging the identity:

$$Y - C - G = I + CA$$

Therefore:

$$S = I + CA$$

$$\boxed{CA = S_p + S_g - I = (S_p - I) + S_g}$$

Question 2

The hypothesis states that government deficits (negative S_g) lead to current account deficits (negative CA).

From our identity: $CA = (S_p - I) + S_g$

The key assumption:
The private sector balance $(S_p - I)$ remains relatively stable.
If $(S_p - I) \approx$ constant, then:

$$\Delta CA \approx \Delta S_g$$

This means:

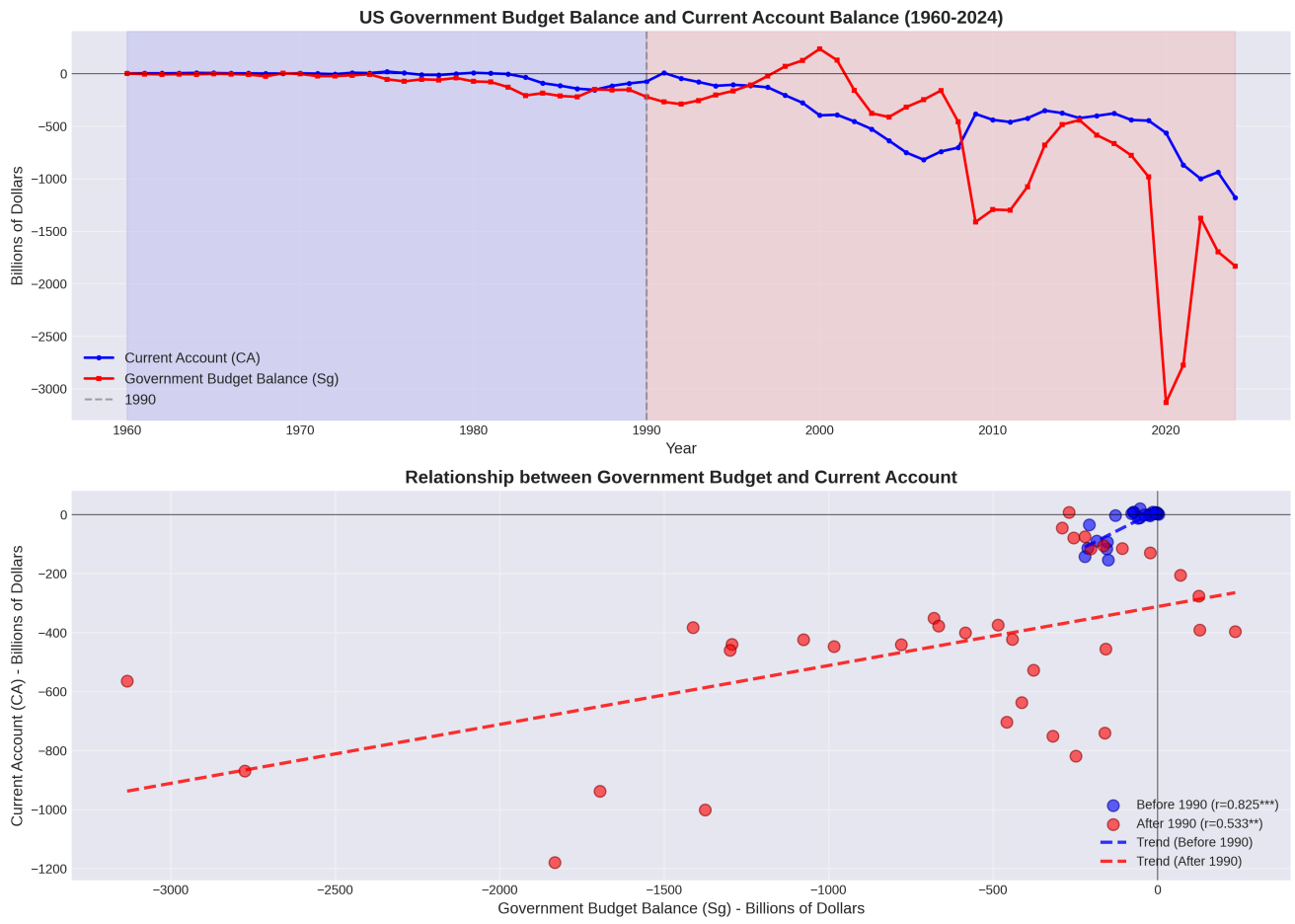
- When government runs a deficit ($S_g < 0$), CA becomes negative (deficit)

- When government runs a surplus ($S_g > 0$), CA becomes positive (surplus)

Implicit assumption about private balance:
The private asset position ($S_p - I$) should be stable to changes in government savings meaning:

1. Private savings don't increase enough to offset government decrease in saving
2. Investment doesn't adjust to absorb changes in government borrowing

Question 3



Question 3.png

Yes, the data supports the twin deficits hypothesis

Before 1990 (1960-1989):

- Very strong positive correlation
- Both variables were relatively stable and closer to balance
- When government budget moved into deficit, current account followed strongly

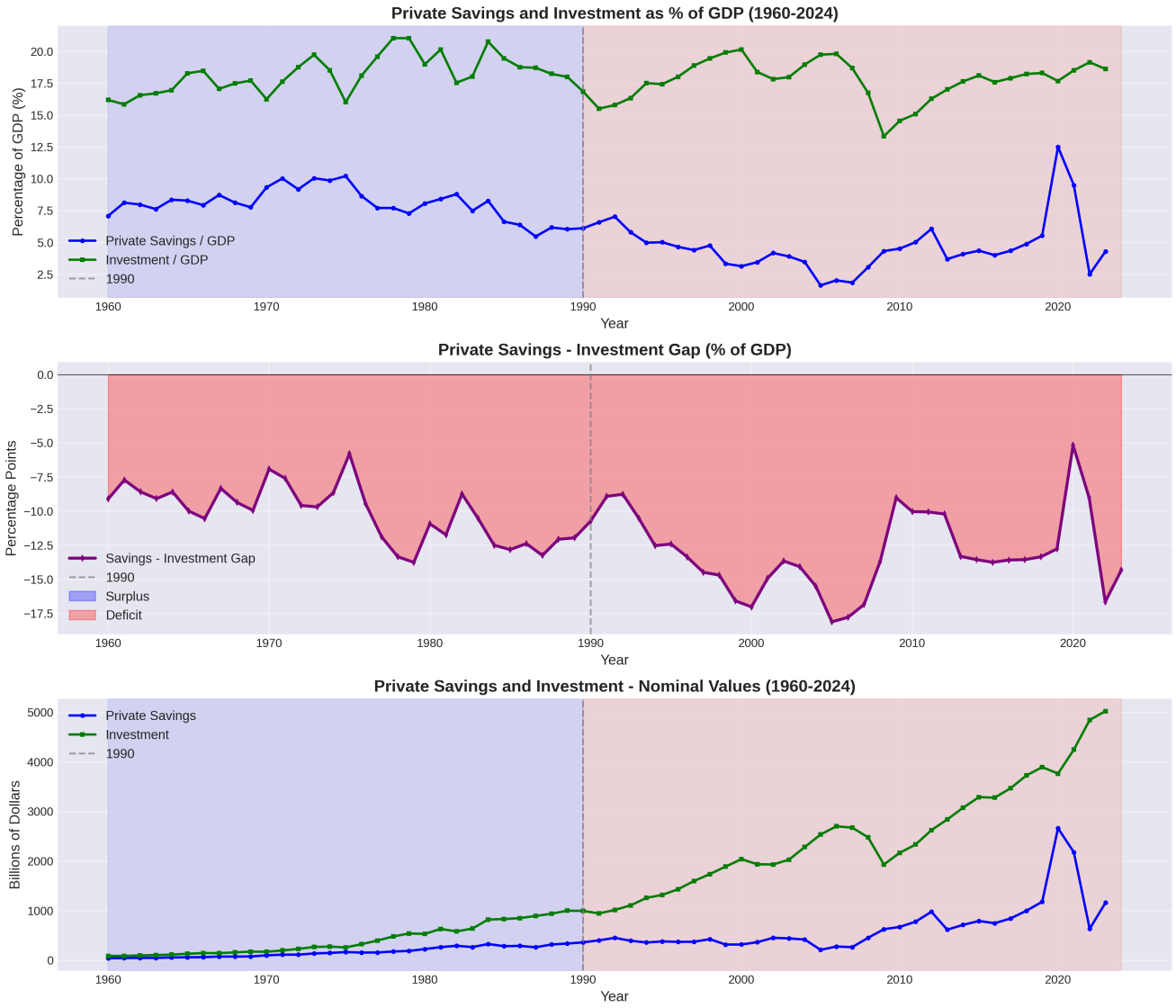
After 1990 (1990-2024):

- Moderate positive correlation
- Both the deficits became structurally larger and persistent
- The twin deficits are evident in the sustained movement into large deficit territory

The correlation weakened after 1990 not because the hypothesis failed, but because:

1. Both deficits became persistently large (less variation)
2. Private savings decline added another major driver
3. The relationship became more complex but fundamentally valid

Question 4



Question 4.png

Private Savings/GDP:

- Before 1990: 8.05% average
- After 1990: 4.67% average
- Decline of 42% (3.38 percentage points)

Investment/GDP:

- Before 1990: 18.22% average
- After 1990: 17.70% average
- Relatively stable

S-I Gap:

- Before 1990: -10.16%
- After 1990: -13.03%
- Gap widened by 2.87 percentage points

The national accounting identity explains this:

$$CA = (S - I) + (T - G)$$

Where:

- CA = Current Account Balance
- S = Private Savings
- I = Investment
- T = Government Revenue
- G = Government Spending

Why the Twin Deficits Hypothesis Weakened After 1990:

The weakening of the correlation occurred because the private sector balance $(S_p - I)$ ceased to be stable, which was the implicit assumption of the twin deficits hypothesis.

Before 1990:

- Private savings and investment were relatively balanced ($S - I$ gap: -10.16%)
- The private sector balance was fairly stable
- Therefore, changes in government balance ($T - G$) had a direct, predictable effect on the current account
- This explains the very strong correlation

After 1990:

- Private savings collapsed from 8.05% to 4.67% of GDP (42% decline)
- Investment remained stable at ~18% of GDP
- The $S - I$ gap widened dramatically from -10.16% to -13.03%
- This means (Sp - I) became a larger, more variable driver of the current account
- The current account is now influenced by two volatile components: government deficits and private sector imbalances
- This explains why the correlation with government balance alone weakened

The implications:
From the identity $CA = (S_p - I) + (T - G)$, when $S_p - I$ was stable before 1990, the twin deficits hypothesis held strongly. After 1990, the $S_p - I$ term became the

dominant and more variable driver, explaining why government balance alone is no longer a strong predictor of current account balance.