

Current account and government budget: A case of twin deficits?

Some definitions:

- Current account (CA): international flows of goods, services and income.

CA = net exports of goods and services
+ income from foreign assets
+ international gifts

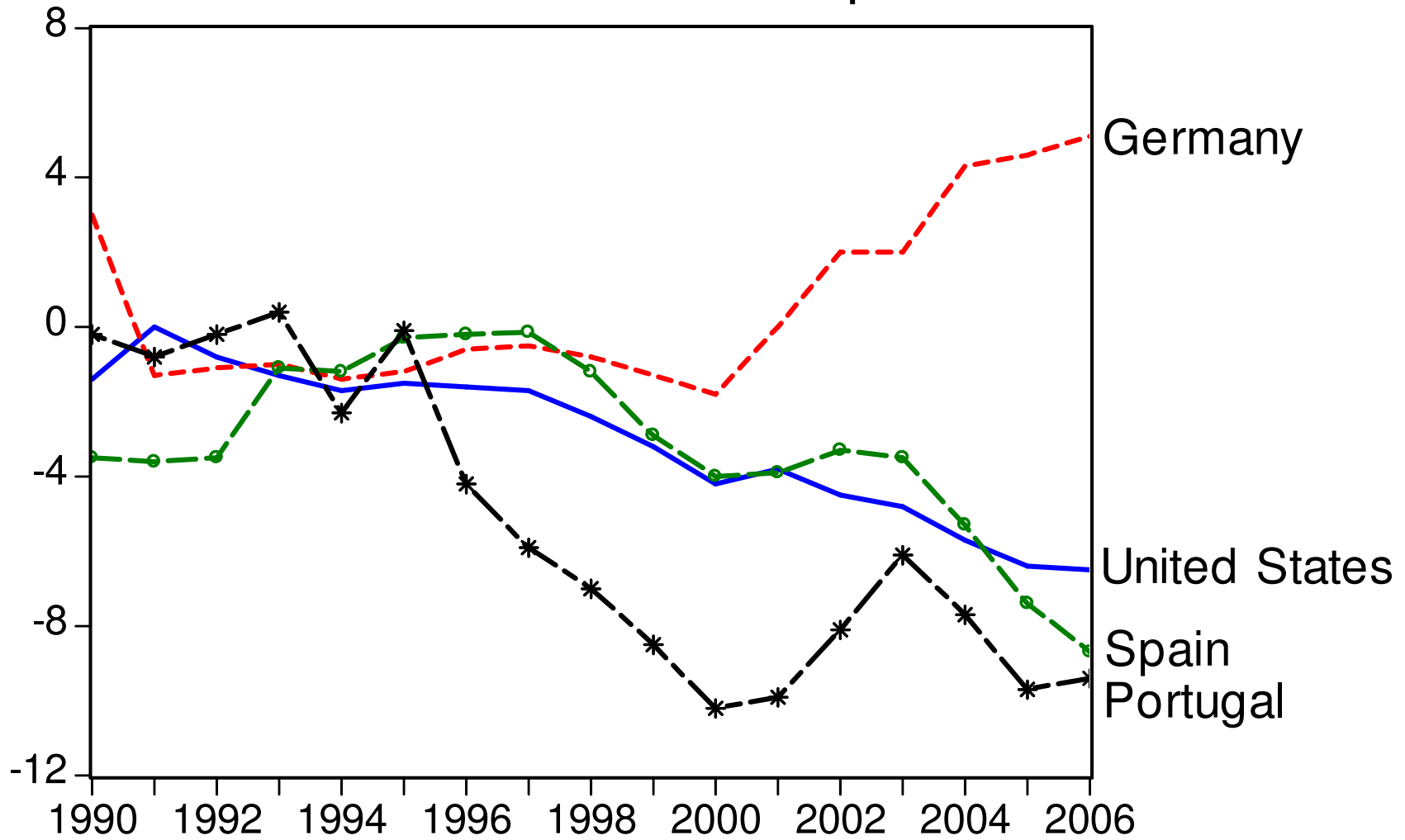
- A current account deficit ($CA < 0$) means a country is importing more from abroad than it is exporting abroad.

- Gross national income (Y): Total value of final goods and services produced by a country's factors of production.
- Can decompose this into expenditure categories:

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

- *C*: consumption
- *I*: investment
- *G*: government consumption
- *CA*: current account

Current Account as share of γ



Source: OECD

Question: where are the large current account deficits coming from? One possibility...

- Twin deficits hypothesis: tendency for government budget deficits to cause current account deficits.
- To evaluate this claim, decompose total national saving (S) into two parts. Total saving (S) =
 - public saving by the government sector
$$S^g = T - G, \text{ where } T \text{ is taxes}$$
 - ◆ private saving by households and firms
$$S^p = Y - T - C$$

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

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

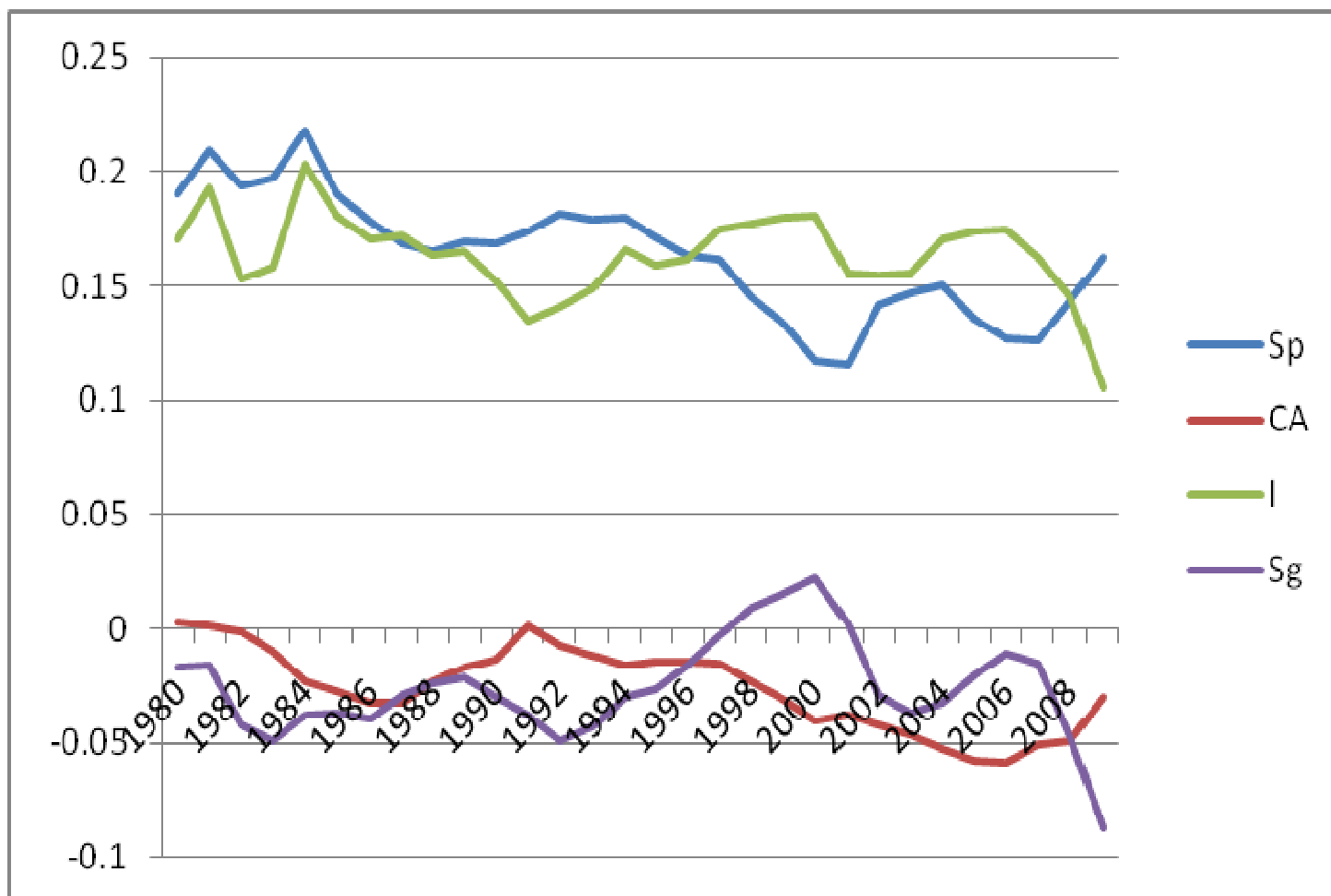
$$= (Y - T - C) + (T - G) - I$$

$$= s^p + s^g - I$$

$$= \text{private saving} - \text{government deficit} - I$$

- Implication: All else equal an increase in the government deficit causes an increase in the current account deficit.
- But is all else equal?
- In the US data below, which of these components contributes to the CA deficit?

U.S. CA and components as shares of GNDI (1980-2009)



Source: IFS

Questions:

- When is it justified to run a current account deficit?
- How large a deficit is too large?

The simple accounting exercises above cannot answer these questions. We need a formal model.

Approach: we solve for the current account in a model based upon optimizing economic agents.

Implication: the current account deficits implied here can be interpreted as optimal given the economic conditions, and thereby can be justified in economic terms.

Part 2.

A Two-period model of the current account

Assumptions:

- **Open:** can borrow freely at the world real interest rate (r)
- **Small:** actions of domestic agents do not affect the world capital market. So the world interest rate is exogenous. We assume here it is fixed.
- **One world good used** for consumption (C).
- **Endowment economy**, with output levels (Y) exogenous.
- Government spending and investment also exogenous
- **Riskless bond** is only asset (B)
- **Representative agent** lives two periods and chooses consumption for each period.
- Discounts future at rate β . Assume $\beta = 1/(1+r)$.

Problem: maximize discounted sum of utility subject to the budget constraints.

$$\max_{C_1, C_2} U(C_1) + \beta U(C_2)$$

$$s.t. Y_1 - I_1 - G_1 - C_1 = B \quad \text{period 1 budget constraint}$$

$$Y_2 + (1+r)B - I_2 - G_2 - C_2 = 0 \quad \text{period 2 budget constraint}$$

$$\text{where } U(C_t) \equiv \frac{1}{1-\sigma} C_t^{1-\sigma}$$

Interpret period 1 budget constraint: $Y_1 - I_1 - G_1 - C_1 = B$

- Left side is CA in period 1
- Right side is purchase of international bonds in period 1
- So if $CA < 0$, must have $B < 0$:

Lesson: To finance a current account deficit, a country must issue international debt.

Interpret period 2 budget constraint:

$$Y_2 - I_2 - G_2 - C_2 = -(1+r)B$$

Lesson: In the future, the country must pay for this debt ($B < 0$) by lowering expenditure below income.

Deriving an “intertemporal” budget constraint:

To keep things short, let's use the notation: $NO_t \equiv Y_t - I_t - G_t$

Write first period budget constraint: $NO_1 - C_1 = B$

Period 2 budget constraint may be rewritten: $B = \frac{C_2 - NO_2}{1+r}$

Combine the two: $NO_1 - C_1 = B = \frac{C_2 - NO_2}{1+r}$

to find the intertemporal budget constraint

$$C_1 + \frac{C_2}{1+r} = NO_1 + \frac{NO_2}{1+r}$$

$$C_1 + \frac{C_2}{1+r} = NO_1 + \frac{NO_2}{1+r}$$

Interpret the intertemporal budget constraint: Consumption is not limited to current income each period; but over time, total discounted consumption is limited to total discounted income.

Maximization Problem

An easy way to take the maximum is to use the intertemporal budget constraint to substitute out for C_2 in objective:

$$C_2 = -(1+r)C_1 + (1+r)NO_1 + NO_2$$

So
$$\max_{C_1, C_2} \frac{1}{1-\sigma} C_1^{1-\sigma} + \beta \frac{1}{1-\sigma} C_2^{1-\sigma}$$

Becomes:

$$\max_{C_1} \frac{1}{1-\sigma} (C_1)^{1-\sigma} + \beta \frac{1}{1-\sigma} [-(1+r)C_1 + (1+r)NO_1 + NO_2]^{1-\sigma}$$

Find the maximum by setting derivative equal to zero:

$$C_1^{-\sigma} + \beta \left[(1+r)C_1 - (1+r)NO_1 - NO_2 \right]^{-\sigma} (1+r) = 0$$

$$C_1 + (\beta(1+r))^{\frac{-1}{\sigma}} \left[(1+r)C_1 - (1+r)NO_1 - NO_2 \right] = 0$$

Simplifies if impose our assumption that $\beta = 1/(1+r)$

$$(2+r)C_1 - (1+r)NO_1 - NO_2 = 0$$

$$\frac{2+r}{1+r} C_1 = NO_1 + \frac{NO_2}{1+r}$$

or

$$C_1 = \left(\frac{1+r}{2+r} \right) NO_1 + \left(\frac{1}{2+r} \right) NO_2$$

Note the Consumption smoothing behavior:

from above:

$$\frac{2+r}{1+r} C_1 = NO_1 + \frac{NO_2}{1+r}$$

If we substitute this into the intertemporal budget constraint:

We get:

$$C_1 + \frac{C_2}{1+r} = NO_1 + \frac{NO_2}{1+r}$$

$$C_1 + \frac{C_2}{1+r} = \frac{2+r}{1+r} C_1$$

So

$$\frac{C_2}{1+r} = \frac{C_1}{1+r} \quad \text{or} \quad C_1 = C_2$$

Interpretation: household wishes to smooth consumption across time periods.

Deriving Current Account behavior:

Using period 1 budget constraint, current account becomes:

$$CA_1 = NO_1 - C_1$$

Substitute in our solution for consumption above:

$$C_1 = \left(\frac{1+r}{2+r} \right) NO_1 + \left(\frac{1}{2+r} \right) NO_2$$

$$CA_1 = NO_1 - \left[\left(\frac{1+r}{2+r} \right) NO_1 + \left(\frac{1}{2+r} \right) NO_2 \right]$$

To get:

$$CA_1 = \frac{1}{2+r} (NO_1 - NO_2)$$

Or equivalently

$$CA_1 = \frac{\beta}{1+\beta} (NO_1 - NO_2)$$

Interpretation of $CA_1 = \frac{\beta}{1+\beta}(NO_1 - NO_2)$

Current account depends on how output is expected to change over time.

Consider:

If $NO_1 > NO_2$, run CA surplus in period 1 as save for future in order to smooth consumption.

If $NO_1 < NO_2$, run CA deficit in period 1 as borrow from future in order to smooth consumption.

This logic applies to all the components of NO : output, investment, and government consumption.

Consider:

If $NO_1 > NO_2$, because $G_1 < G_2$ run CA surplus in period 1 as save for future in order to smooth consumption.

If $NO_1 < NO_2$, because $G_1 > G_2$ run CA deficit in period 1 as borrow from future in order to smooth consumption.

Implications for the Twin Deficits Hypothesis:

To show the role of government budget deficit explicitly, need to introduce lump-sum taxes and government borrowing into the two-period model.

Define: T lump-sum taxes

B^G government issue of bonds

B^P bonds issued by private sector:

$B = B^P + B^G$: Total bond holding by household

Household budget constraints become:

$$Y_1 - I_1 - T_1 - C_1 = B \quad \text{period 1 budget constraint}$$

$$Y_2 + (1+r)B - I_2 - T_2 - C_2 = 0 \quad \text{period 2 budget constraint}$$

$$C_1 + \frac{1}{1+r}C_2 = (Y_1 - I_1 - T_1) + \frac{1}{1+r}(Y_2 - I_2 - T_2) \quad \text{intertemporal constraint}$$

Government has its own budget constraints:

$$B^G = G_1 - T_1 \quad \text{period 1}$$

$$(1+r)B^G = T_2 - G_2 \quad \text{period 2}$$

$$G_1 - T_1 = -\frac{1}{1+r}(G_2 - T_2) \quad \text{intertemporal}$$

Combine household and government constraints:

$$C_1 + \frac{1}{1+r}C_2 = (Y_1 - I_1 - G_1) + \frac{1}{1+r}(Y_2 - I_2 - G_2)$$

This constraint is the same as for the case we solved above, hence the optimal consumption path is the same and current account is the same.

Interpretation:

- Solution for C and CA above still holds: high government spending implies current account deficit.
- Under the assumptions in this model, the timing of the taxes does not affect consumption or the current account (Ricardian model).

Does Twin deficits hypothesis apply here? It depends:

- If the government deficit results from high government spending ($G_1 > G_2$), then will imply a CA deficit.
- If it results just from low taxes ($T_1 < T_2$) alone, then does not imply a current account deficit.

Lessons:

- 1) A current account deficit is not necessarily a bad thing, but it comes at a cost.
- 2) Cost: To finance a current account deficit, a country must borrow from abroad (or sell of its existing assets), implying future debt obligations.
- 3) Benefit: allows a country to smooth the impact of shocks to income or to government spending.
- 4) Government budget deficits can lead to current account deficits, depending on the response in private saving.
- 5) Question: is now a reasonable time for the US to run a current account deficit? (recession, high government spending...)