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## Lecture 1: current account - measurement and theory

What is international finance (as opposed to international trade)?

- International trade: microeconomic approach (many goods and factors). How cross country differences in factor endowments and technology affect specialization in production and international trade in goods and services.
- International finance: macroeconomic approach. Determination of aggregate output, saving and trade balance in open economies. Determinants of international trade in assets (i.e. across states of nature and time).

Money is one such asset. National prices denominated in terms of national monies → the exchange rate affects the relative price of foreign assets measured in units of home money.

## 1.1 National income accounting in open economy

Goods market equilibrium condition for an open economy (GDP)

$$Y_t = C_t + I_t + G_t + \underbrace{X_t - \overbrace{(C_t^f + I_t^f + G_t^f)}^{M_t}}_{NX_t} \quad (1)$$

Current account = Net export plus net income from abroad. If only income from abroad is asset income and  $B_t$  is the net stock of foreign assets owned by home residents

$$CA_t = NX_t + r_t B_t. \quad (2)$$

Equations (1) and (2) imply

$$Y_t = C_t + I_t + G_t + CA_t - r_t B_t. \quad (3)$$

Rearrange

$$Y_t + r_t B_t - C_t - G_t - I_t = CA_t. \quad (4)$$

$Y + rB$  is GNP, income earned by domestic residents (even if generated abroad).

- $CA > 0$  : surplus. Country is spending less than it earns  $\rightarrow$  lending abroad.
- $CA < 0$  : deficit. Country is spending more than it earns  $\rightarrow$  borrowing from abroad.
- $CA$  can be zero even if  $Y < C + I + G$  if country enjoys positive net income from abroad.

## 1.2 Saving and the current account

$$\underbrace{Y_t + r_t B_t - T_t - C_t}_{S_t^p} + \underbrace{T_t - G_t}_{S_t^g} - I_t = CA_t \quad (5)$$

- The current account is the excess flow of national saving over investment as well as the excess of domestic income over domestic expenditure.
- Domestic investment does not need to be fully financed by domestic saving. Borrowing from abroad decouples the two.

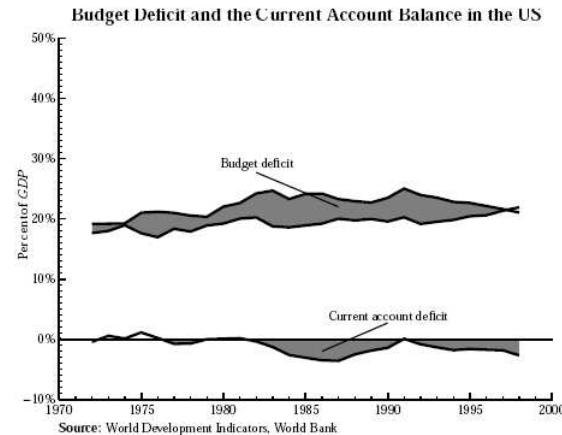
### 1.3 Budget deficits and the current account

Equation (5) above can be rearranged as

$$S_t^p + \underbrace{T_t - G_t}_{S_t^g} - I_t = CA_t \quad (6)$$

Note that  $S_t^g = T_t - G_t = -(G_t - T_t) = -BD_t$ .

- Equation (6) implies that **if  $S_t^p$  and  $I_t$  are unchanged** then a change in the government budget deficit must be accompanied by an equal change in the current account deficit.
- In the early 80s (and after the current Iraq war)  $BD$  in the US was accompanied by CA deficit. Some economists argued that the former *caused* the latter (twin deficit theory).



- Problem with the theory:  $S^p$  and  $I$  are endogenous variables that can (and do) respond to changes in  $BD$ . No relation of causality from a theoretical point of view; e.g. EU budget tightening at the end of the Nineties did not result in increases in  $CA$  surplus.
- To turn the twin deficit conjecture into a theory we need to specify behavioral relationships: what determines saving and investment. To be done soon...

#### 1.4 Asset stocks - Balance of Payments (BoP) accounts

- A positive current account means that the country is lending to the rest of the world. Its stock of foreign assets increases

$$B_{t+1} - B_t = CA_t. \quad (7)$$

Viceversa a negative current account means the country is borrowing and its stock of foreign assets is falling.

- The stock of foreign assets equals the cumulated sum of all past  $CA$  surpluses

$$B_t = B_0 + CA_1 + CA_2 \dots \quad (8)$$

- $B_t$  can be less than zero if the country is a net debtor to the rest of the world; e.g. the US net external debt is roughly equal 25% of US GDP.



BoP records all economic transactions between a country's residents and the rest of the world.

Two types of transactions:

- Payments for goods and services (including factor services): current account
- Accumulation/decumulation of assets: financial account (FA) and capital account (KA).
  - KA: one-off changes in asset stock (e.g. debt forgiveness)
  - FA: changes in asset stocks due to purchases or sales.
    - \* Capital inflow:  $\Delta FA > 0$ . Sale of domestic assets. Export of the assets (i.e. more liabilities to foreigners).
    - \* Capital outflow:  $\Delta FA < 0$ . Purchase of foreign assets. Import of the assets (i.e. less liabilities to foreigners).

Equation (7) can be rewritten as the BoP identity

$$BoP_t = CA_t + (B_t - B_{t+1}) = CA_t + (FA_t + KA_t) = 0. \quad (9)$$

Suppose  $KA_t = 0$ .

- $FA_t > 0 \rightarrow B_t - B_{t+1} > 0$ ; more assets imported than exported, fall in net foreign wealth.
- $FA_t < 0 \rightarrow B_t - B_{t+1} < 0$ ; more assets exported than imported, increase in net foreign wealth.
- Official reserve transactions:  $FA_t = FA_t^p - \Delta R_t$ .  $R_t$  reserves of foreign assets held by Central Bank.

A second look at financing the current account

$$CA_t + (FA_t^p + KA_t) = \Delta R_t. \quad (10)$$

- If  $CA_t$  cannot be financed privately -  $CA_t + (FA_t^p + KA_t) < 0$  - the Central Bank has to sell reserves:  $\Delta R_t < 0$ . If it does not have enough the country is bankrupt (e.g. Russia, Asian crisis).
- Reserves are a cushion against drying up of capital inflow (that is why China has accumulated so much \$ reserves).
- Reserves are part of a country money supply. Buying and selling by Central bank to affect macroeconomic conditions.

## 1.5 Understanding CA: Fischer's intertemporal theory of consumption

This is the backbone of any modern theory of the consumption function. We present a stripped-down version of it.

Assumptions:

1. endowment economy (no production)
2. Consumers: live for two periods and maximize their concave lifetime utility function
$$U(c_1, c_2) = u(C_1) + \beta u(C_2).$$
3. Endowments:  $Y_1$  units of the consumption good in the first period of life and  $Y_2$  in the second one. The good is non-storable.
4. Endowments can be freely borrowed and lent at the real interest rate  $r$  subject to solvency.

$$B_1 = S_1 = (Y_1 - C_1) \quad (11)$$

$$B_2 - B_1 = S_2 = (Y_2 + rB_1 - C_2) \quad (12)$$

**Solvency:** with finite lifetimes solvency means that agents cannot die with a positive stock of debt; i.e.  $B_2 \geq 0$ . If the marginal utility of consumption is positive it implies  $B_2 = 0$ .

- Solvency then requires  $S_2 = -B_1 = -S_1$  or  $C_2 - Y_2 = (1 + r)(Y_1 - C_1)$ . The PDV of lifetime consumption equals the PDV of lifetime income (**intertemporal budget constraint (IBC)**).
- Intertemporal trade (borrowing and lending) decouples *current* consumption from *current* income (**consumption smoothing**) but not over lifetime.