

# INTERNATIONAL ECONOMICS

**Lecture 8 — January 5, 2021**

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# Organization

- who takes exam in February?
- last regular lecture on Feb 2, Q&A on Feb 9

**INTERNATIONAL  
MACROECONOMICS**

# International Macroeconomics

Topics for the following weeks:

- National Income Accounting and Balance of Payments
- Intertemporal consumption
- Exchange rates (PPP, LOOP)
- Exchange rates regimes
- Optimal currency areas
- Crises
- Financial globalization and development

# Trade to Macroeconomics

- **International trade:** welfare gains through decoupling of production and consumption within country
  - Trade assumed balanced
- **International financial markets:** decoupling of production and consumption over time
  - Trade not balanced in each period

# MACROECONOMIC ACCOUNTS

# Macroeconomic accounts

- **National Income Accounting:** all expenditures that contribute to income and output
- **Balance of Payments Accounting:** all transactions between domestic and foreign economy in time period

# National Income Accounting

- value of national income that results from production and expenditure
  - Producers earn income from buyers who spend money on goods and services
  - amount of expenditure by buyers = amount of income for sellers = the value of production



# Gross national product vs. Gross domestic product

- Gross National product (GNP): value of all final goods and services *produced by a country's factors of production*
  - Gross Domestic Product (GDP): value of *production within a country's borders*
- $GDP = GNP - \text{factor payments from foreign countries} + \text{factor payments to foreign countries}$

# Gross national product

- GNP calculated by adding the value of expenditure on final goods and services
- Four types of expenditure
  - Consumption: part of GNP purchased by the private sector to fulfill current demand
  - Investment: part of GNP used by private firms to produce future output
  - Government Purchases: goods and services purchased by federal, state, or local governments
  - Current account balance: exports minus imports, net expenditure by foreigners on domestic goods and services

# National Income Identity

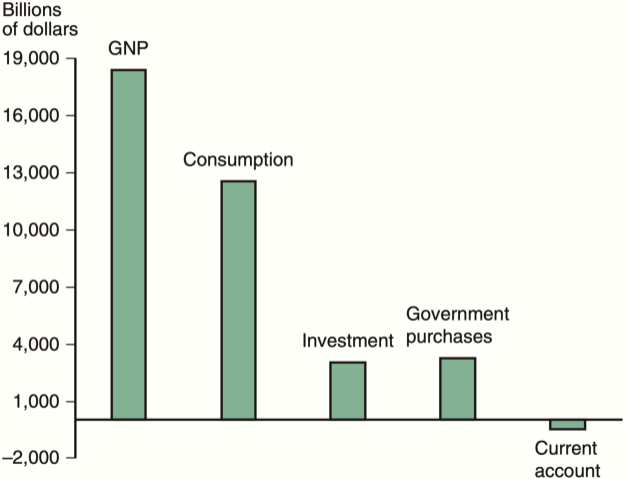
*National Income Identity* postulates that

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

- $Y$  is GNP
- $C$  is consumption
- $I$  is investment
- $G$  is government purchases
- $EX$  is exports
- $IM$  is imports
- $CA$  is current account

→ in a closed economy,  $EX = IM = CA = 0$

# Gross national product: USA Q1 2016

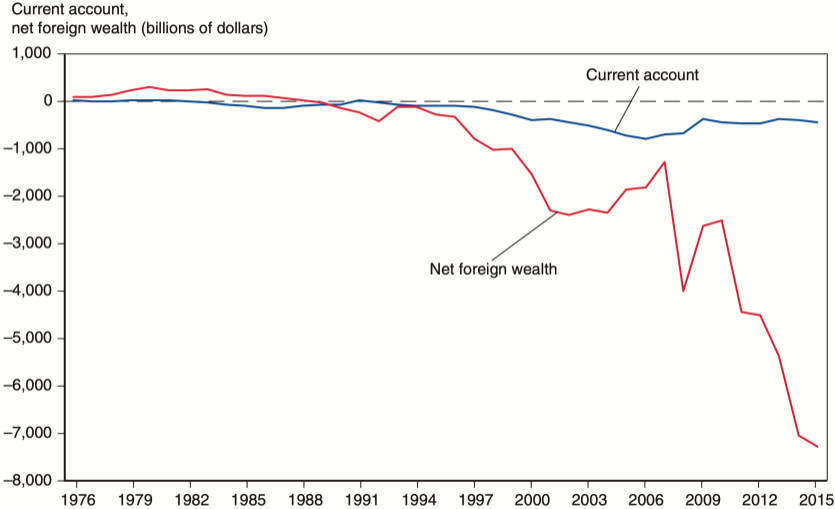


# Current account

$$CA = EX - IM = Y - (C + I + G)$$

- When production > domestic expenditure, exports > imports
  - current account > 0, trade balance > 0
  - more income from exports than it spends on imports
  - net foreign wealth is increasing
- When production < domestic expenditure, exports < imports
  - current account < 0, trade balance < 0
  - less income from exports than it spends on imports
  - net foreign wealth is decreasing

# Current account



# Current account deficit/surplus

(In moderation) neither necessarily good or bad:

- **Deficit not “losing money”**: imports greater than exports, borrow or sell domestic assets
- **Deficit not “losing jobs”**: increase in imports doesn't mean less labor demand  
→ see trade theory
- **Surplus not “winning”**: I'm looking at you Germany (or USA)

→ but: sustained *imbalances* might be problematic, more later

# National savings and current account

## National savings $S$

- in closed economy: equal to investment:  $S = I$ 
  - saving only by building up capital stock
- in open economy: own capital stock or foreign wealth:  $S = I + CA$ 
  - CA surplus also called net foreign investment (change in net foreign wealth)



# National savings

National savings  $S$  can be decomposed into

$$S = S_p + S_g \quad \text{where}$$
$$S_p = Y - T - C \quad \text{and}$$
$$S_g = T - G$$

- $S_p$  is private savings
- $T$  is the government's income: net tax revenue
- $S_g$  is government savings:  $T - G$
- Government budget deficit:  $G - T$ 
  - measures extent of government borrowing to finance expenditures

# Twin deficits hypothesis

Combining equations:

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

→ "*Twin deficits*" hypothesis

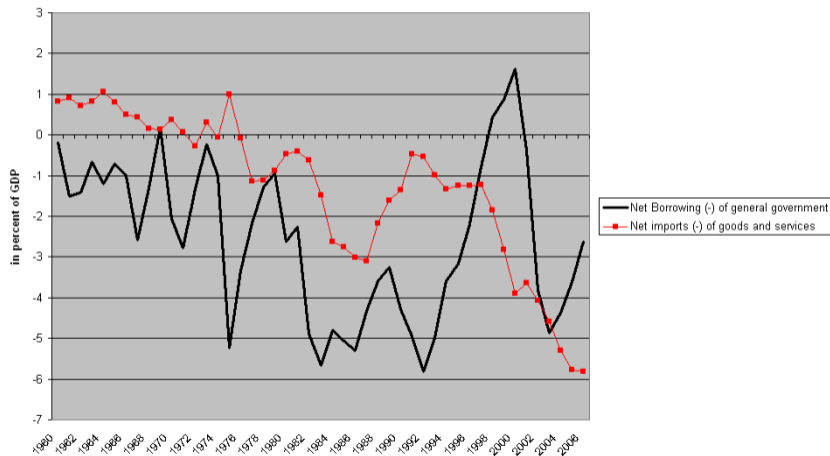
# Twin deficits hypothesis

*"Twin deficits"* hypothesis:

- Strong link between a national economy's current account balance and its government budget balance
- With given output and savings, assume increasing budget deficit  $T - G$
- leads to either lower investment  $I$  (crowding out)
- or current account deficit  $CA$  (twin deficits)

# Twin deficits hypothesis

The "Twin Deficit" in the USA



# Balance of payments

A country's *Balance of Payments* accounts keep track of both its *payments to* and its *receipts from* foreigners

Three types of international transactions:

- *current account*: accounts for flows of goods and services
- *financial account*: accounts for flows of financial assets
- *capital account*: flows of special categories of assets
  - typically non-market, non-produced, or intangible assets like debt forgiveness, copyrights and trademarks

# International transactions

International transactions either:

- Credits: payment *into* the country
  - e.g., exports, capital inflows
- Debits: payment *out of* the country
  - e.g., imports, capital outflows

→ Current account deficit implies capital and/or financial account surplus

International transaction automatically has **two offsetting entries** in the balance of payments so that:

$$\text{Current account} + \text{Capital account} + \text{Financial account} = 0$$

# International Investment Position

- If  $CA < 0$  country finances consumption/investment by getting indebted
- Over time then  $\sum_t CA_t \approx IIP_t$ : evolution of external debt, "international investment position"
- Importing current consumption and exports future consumption



# International Investment Position

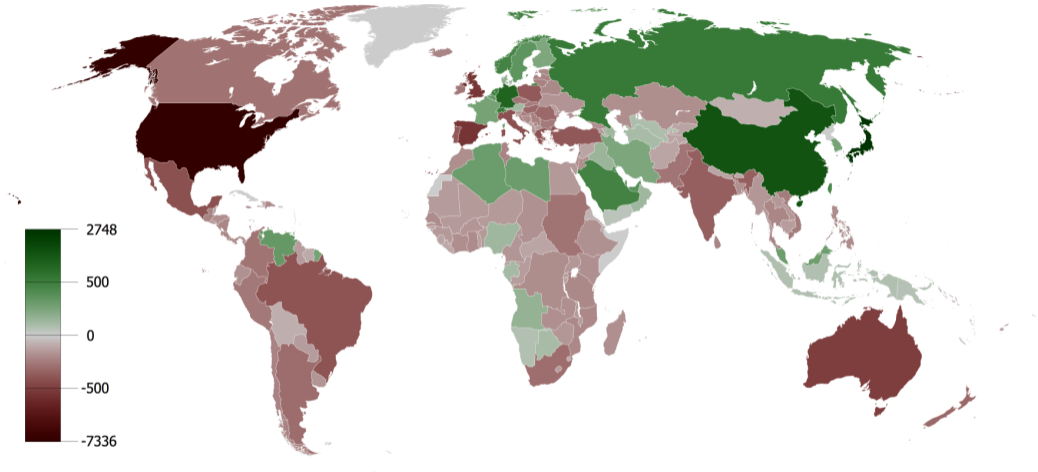
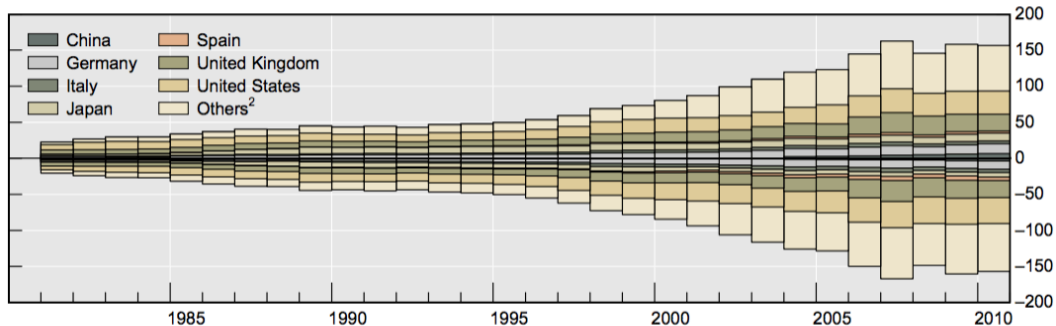


Figure: Wikipedia/IMF (2012)

# International Investment Position

**International investment positions of all countries<sup>1</sup>**  
**As a percentage of world GDP**



<sup>1</sup> Latest available data. <sup>2</sup> Sum of 114 economies.

Sources: IMF, *International Financial Statistics* and *World Economic Outlook*.

Figure: IMF (2012)

INTERTEMPORAL  
CONSUMPTION  
DECISION

# Intertemporal Consumption Decision

- Assume small open economy, free asset trade (no transaction cost), no government
- Discount factor  $\beta < 1$ : consume today or tomorrow?
- Interest rate  $r$ , consumption  $c_t$ , income  $y_t$
- Two periods, representative consumer maximizes utility  $u(c_t)$

# Intertemporal Consumption Decision

$$\max_{c_1, c_2} u(c_1) + \beta u(c_2) \quad \text{s.t.} \quad c_1 + \frac{c_2}{1+r} \leq y_1 + \frac{y_2}{1+r}$$

Lagrangian then:

$$L = u(c_1) + \beta u(c_2) + \lambda \left( y_1 + \frac{y_2}{1+r} - c_1 - \frac{c_2}{1+r} \right)$$

# Intertemporal Consumption Decision

First order conditions:

$$\frac{\partial L}{\partial c_1} = u'(c_1) - \lambda = 0$$
$$\frac{\partial L}{\partial c_2} = \beta u'(c_2) - \lambda \frac{1}{1+r} = 0$$

so that

$$\beta u'(c_2) - u'(c_1) \frac{1}{1+r} = 0$$

# Intertemporal Consumption Decision

Or, rearranging:

$$u'(c_1) = u'(c_2)\beta(1 + r)$$

- $c_1$  and  $c_2$  are positively correlated: consumption smoothing
- if  $\beta = \frac{1}{1+r}$ : consumption time-invariant
- if consumers impatient, then  $1+r$  consumption higher in the first period

# Intertemporal Consumption Decision

Assume logarithmic utility function:  $u(c_t) = \ln(c_t)$

Then FOC:

$$\frac{c_2}{c_1} = \beta(1 + r)$$

From budget constraint follows:

$$c_1 + \frac{c_2}{1 + r} = c_1(1 + \beta) = y_1 + \frac{y_2}{1 + r} \equiv Y$$



# Intertemporal Consumption Decision

This then implies:

$$c_1 = \frac{Y}{1 + \beta}$$

$$c_2 = \beta(1 + r) \frac{Y}{1 + \beta}$$

- if  $\beta(1 + r) = 1$ : consumption is constant over time
- country has a *CA* surplus if  $y_1 > c_1$  and a *CA* deficit otherwise

# Utility

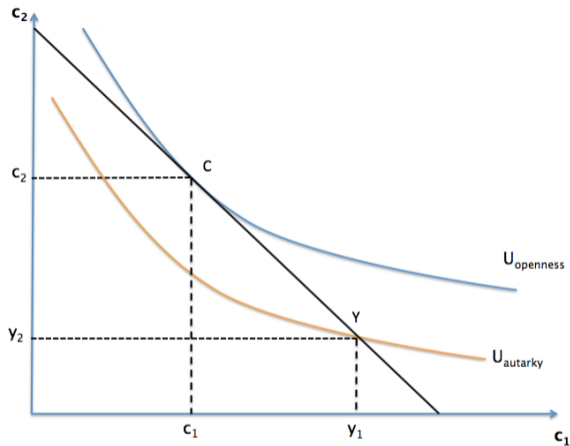


Figure: Mejean (2013)

→ here  $CA_1 > 0$ ,  $CA_2 < 0$

# Intertemporal Consumption Decision

- Call  $NFA_t$  the net foreign assets at time  $t$
- Current account then:

$$CA_t = y_t - c_t + r \cdot NFA_t$$

- In our two period world then

$$\begin{aligned} NFA_2 &= NFA_1 + CA_1 \\ &= NFA_1 + y_1 - c_1 + r \cdot NFA_1 \\ &= y_1 - c_1 + (1 + r) \cdot NFA_1 \end{aligned}$$

# Intertemporal Consumption Decision

- For sustainability in two period, we must have

$$NFA_2 + CA_2 = 0$$

- Intertemporal budget constraint there implies

$$NFA_1 = \frac{1}{1+r}(c_1 - y_1) + \frac{1}{(1+r)^2}(c_2 - y_2)$$

# Intertemporal Consumption Decision

With infinite horizon this means

$$NFA_1 = \sum_t \frac{1}{(1+r)^t} (C_t - Y_t)$$

→ *debt sustainability condition*

→ external debt only sustainable with future CA surpluses

**PUZZLES**

# Feldstein-Horioka Puzzle

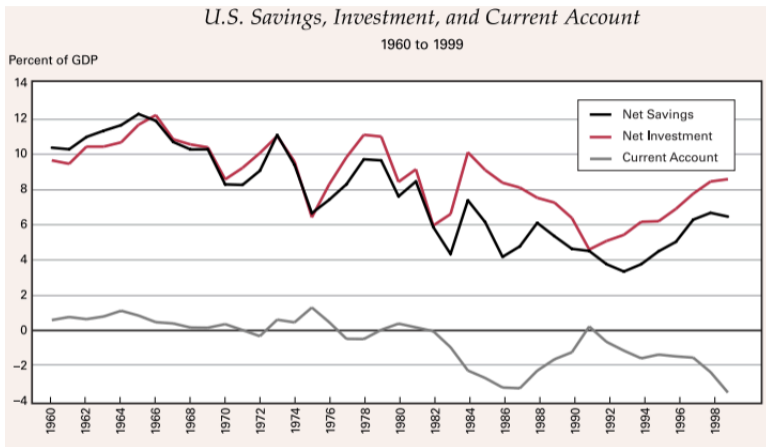


Figure: Boston Fed/Olivei (2000)

# Feldstein-Horioka Puzzle

*"If capital could move freely and costlessly, there would be no correlation between a country's savings and investment."*

— *Feldstein-Horioka (1980)*

→ but: high correlation between  $S$  and  $I$  even in the OECD

Possible explanations:

- "home bias" in investment due to asymmetric information
- country risk/insufficient creditor protection
- both government savings and investment are procyclical
- transaction costs



# Lucas Paradox

*In a world with North and South, where North resident are older and richer: the basic growth models predicts capital has a higher return in South. Why don't we observe more capital flows from North to South?*

— Lucas Paradox (1990)

Possible explanations:

- low productivity, lack of skills, corruption in the South
- financial underdevelopment forces South to save before investing and to hold North assets
- weak safety net forces South to hold excess savings

## Next week

- Topic: Exchange rates
- Read: Chapter on National Income Accounting and Balance of Payments/Current Account