

## Issues in International Finance

### *National income and product accounts*

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## Roadmap

1. National income accounts measure expenditure, production, and income
2. Adapt national income accounting to the open economy
3. Big idea: Borrowing and lending with the rest of the world (ROW)
4. The balance of payments measuring transactions with ROW
  - ▶ Current account
  - ▶ Financial account
5. External wealth

## The NIPAs

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- ▶ The National Income and Product Accounts (NIPAs) track aggregate income, production, and expenditure
- ▶ In the United States, these are constructed by the Bureau of Economic Analysis (BEA) <https://www.bea.gov/data/gdp>
- ▶ The big three measures:
  - ▶ Gross National Expenditure (GNE)
  - ▶ Gross Domestic Product (GDP)
  - ▶ Gross National Income (GNI)
- ▶ First, look at these in a closed economy (review)
- ▶ Second, look at these in the open economy (partially review)

## NIPAs: GNE

- ▶ Gross national expenditure is spending on final goods and services

$$GNE = C + I + G$$

- ▶  $C$  = private consumption;  $I$  = investment;  $G$  = government spending

## NIPAs:GDP

- ▶ Gross domestic product is value of production of goods and services
- ▶ The sum of the *value added* of every firm in the economy

$$GDP = \sum_f (p_f y_f - \text{int goods}_f)$$

- ▶  $p_f y_f$  = sales of firm  $f$ ;  $\text{int goods}_f$  = intermediate goods
- ▶ Reminder: A firm has three kinds of expenditures
  1. Intermediate goods and services
  2. Payments to labor (wages, salaries, benefits)
  3. Payments to capital holders (profits, rents, equipment investments)
- ▶ This means that the sum of value added = sum of incomes

## NIPAs: GNI

- ▶ Gross national income is total income in the economy

$$GNI = \text{labor income} + \text{capital income}$$

- ▶ Note: Capital gains are not part of GNI (or GDP or GNE). GNI is income from *production*. Capital gains are a change in valuation.

## NIPAs in the closed economy

- ▶ In the closed economy there are no exports, no imports, no expatriate workers, no cross border sales of assets. . .

$$GNE = GDP = GNI$$

- ▶ value of everything purchased = value of everything produced
- ▶ value of everything produced = value of labor and capital producing it
- ▶ value of labor and capital income = value of everything purchased
  
- ▶ In the open economy, each equality is modified. . .

## GNE and GDP in the open economy

- ▶ Gross national expenditure is spending on final goods and services
  - ▶ Now, some goods are not made at home
  - ▶ Now, some goods made at home are sold abroad

$$GDP = \underbrace{C + I + G}_{\text{GNE}} + \underbrace{X - M}_{\text{trade balance}}$$

- ▶  $X$  = exports of goods and services;  $M$  = imports of goods and services
- ▶ The terms “net exports” (NX) and “trade balance” (TB) both refer to  $X - M$ 
  - ▶  $TB < 0$  is a trade deficit
  - ▶  $TB > 0$  is a trade surplus



## GDP and GNI in the open economy

- ▶ Gross domestic product is the value of domestic production
  - ▶ Some labor or capital is from abroad (e.g., rent equipment from foreign company; pay an architect who lives abroad)
  - ▶ Some domestic labor and capital is used abroad (e.g., rent office space to a foreign company, provide consulting services to the UK government)
- ▶ This is about the nationality of the labor and capital owner

$$GNI = \underbrace{C + I + G + X - M}_{\text{GDP}} + \underbrace{X_{FS} - M_{FS}}_{\text{net factor income from abroad (NFIA)}}$$

## GNI and GNDI in the open economy

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- ▶ GNI is the income from production
- ▶ In the open economy, we could also have “gifts” of income from/to abroad
- ▶ Examples: government aid to foreign country; immigrant workers in the U.S. sending money to their families abroad; foreign debt forgiveness
- ▶ There is no reciprocal trade, so we call these unilateral transfers

$$GNDI = \underbrace{C + I + G + EX - IM}_{\text{GDP}} + \underbrace{EX_{FS} - IM_{FS}}_{\text{NFIA}} + \underbrace{UT_{IN} - UT_{OUT}}_{\text{net unilateral transfers}}$$

## The current account

- ▶ An important open-economy measure is the current account (CA)
- ▶ CA summarizes all the cross-border flows

$$CA = (EX - IM) + (EX_{FS} - IM_{FS}) + (UT_{IN} - UT_{Out})$$

- ▶ Current account is the net payment to the domestic economy from abroad

$$GNDI = C + I + G + CA$$

- ▶ If  $CA > 0$  domestic economy earns more than it spends
- ▶ If  $CA < 0$  domestic economy spends more than it earns
- ▶ In a closed economy  $CA = 0$

## US NIPAs: 2012

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	Symbol	\$ bil.
+ Consumption	C	11,120
+ Investment	I	2,062
+ Government	G	3,063
Gross National Expenditure	GNE	16,245
+ Trade Balance	TB	-560
Gross Domestic Product	GDP	15,685
+ Net Factor Income from Abroad	NFIA	243
+ Net Unilateral Transfers	NUT	-157
Gross national Disposable Income	GNDI	15,771

## US NIPAs

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- ▶ In general, GNE spending is pretty stable
  - ▶  $C/GNE \approx 0.70$
  - ▶  $G/GNE \approx 0.15$
  - ▶  $I/GNE \approx 0.15$
- ▶ The current account has been growing more negative
- ▶ Most of the current account is the trade balance
- ▶ <https://fred.stlouisfed.org/graph/?g=lv1y>

## The current account and savings

- ▶ Start from the identity

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

- ▶ Rearrange

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

- ▶ Where  $S = Y - C - G$  is *savings* (i.e., income minus consumption)

$$S = I + CA$$

- ▶ In a closed economy: savings funds investment
- ▶ In an open economy: current account makes up the difference between savings and investment

## A corny example: Closed economy

- ▶ Corn is the only good in the economy
- ▶ At the end of the year pick the corn ( $Y$ )
  - ▶ Eat some ( $C$ )
  - ▶ Whatever you don't eat, plant for next year's crop ( $I$ )
- ▶ Investment is funded by savings: the corn you don't consume is invested

$$Y - C = I$$

## Cross-country lending: A first look

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- ▶ Two countries, home and foreign
- ▶ By definition

$$CA_F = -CA_H$$

- ▶ If  $CA_H < 0$  the  $CA_F > 0$

$$S_H - I_H = CA_H < 0$$

$$S_F - I_F = CA_F > 0$$

- ▶ Foreign country sends its extra savings to the home country to make up the difference between saving and investment
- ▶ This is not a gift: the foreign country must be repaid in the future



## A corny example: Open economy

- ▶ Two countries, each grows corn
- ▶ At the end of the year pick the corn ( $Y_H, Y_F$ )
- ▶ Home finds out that next year will be great for growing corn
  - ▶ Would like to increase investment ( $I_H$ )
  - ▶ Closed economy: decrease consumption ( $C_H$ ) — not good
- ▶ Open economy: borrow some corn from  $F$  ( $X_F > 0, M_H > 0$ )
  - ▶ Increase  $I_H$ , but  $C_H$  falls less

$$Y_H - C_H < I_H$$

$$Y_F - C_F > I_F$$

## More on savings

- ▶ Break up savings into private and government
- ▶ Start with the identity

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

- ▶ Add and subtract tax revenue to the left side

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

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

- ▶ Private:  $S_p = Y - C - T$  (after-tax income minus consumption)
- ▶ Gov't:  $S_g = T - G$  (tax revenue minus expenditure)

$$S_g + S_p = CA + I$$

## The twin deficits

- ▶ Do government deficits cause current account deficits?

$$S_g + S_p = CA + I$$

- ▶ 1990s:  $S_g > 0$  and  $CA$  shrinking towards zero
- ▶ 2000s:  $S_g < 0$  and  $CA$  growing more negative
- ▶ The US: <https://fred.stlouisfed.org/graph/?g=ly5R>

## The twin deficits

- ▶ Do government deficits cause current account deficits?

$$S_g + S_p = CA + I$$

- ▶ 1990s:  $S_g > 0$  and  $CA$  shrinking towards zero
- ▶ 2000s:  $S_g < 0$  and  $CA$  growing more negative
- ▶ Some evidence of the twin deficits (government and current account) but the relationship is not perfect. Depends on
  - ▶ Investment behavior
  - ▶ Private savings behavior

## The balance of payments

- ▶ Balance of payments (BOP) accounts are made up of
  1. The current account ✓
  2. The financial account
  3. The capital account

## The financial account

- ▶ The financial account records cross-border financial asset trade
- ▶ Examples: stocks, bonds, sale of a factory

$$FA = EX_A - IM_A$$

- ▶  $FA > 0$  stock of assets falling
- ▶  $FA < 0$  stock of assets rising

## Assets issuance vs. holdings

- ▶ Every asset has a “nationality”
- ▶ The nationality of the asset corresponds to the country of issue
  - ▶ US T-bill: claim on U.S. tax payer (US issued)
  - ▶ Share of Vodafone stock is a claim on Vodafone profits (UK issued)
  - ▶ A ¥500 coin is claim on ¥500 worth of goods and services sold in Japan (Japan issued)
- ▶ Asset issuance is NOT the same as ownership
  - ▶ An Indian bank can hold US-Tbills
  - ▶ A German hedge fund can hold Vodafone stock
  - ▶ An American tourist can take yen coins back to America

## Assets issuance vs. holdings

- ▶ When a foreign-issued asset is held in the home country, the asset is an
  - ▶ External asset of the home country
  - ▶ External liability of the foreign country
- ▶ Consider the home financial account

$$\begin{aligned}FA &= EX_A - IM_A \\&= EX_A^H + EX_A^F - IM_A^H - IM_A^F \\&= \underbrace{(EX_A^H - IM_A^H)}_{\text{additions to external liab}} - \underbrace{(IM_A^F - EX_A^F)}_{\text{additions to external assets}}\end{aligned}$$

- ▶  $FA > 0$  net addition to external liabilities
- ▶  $FA < 0$  net addition to external assets



## The capital account

- ▶ Not usually important in high-income countries
- ▶ The capital account records cross-border
  - ▶ Trade in nonfinancial, nonproduced assets
  - ▶ Gifts of assets
- ▶ Examples: Patents, franchises, debt forgiveness

$$KA = KA_{IN} - KA_{OUT}$$

- ▶  $KA > 0$  net receiver of assets
- ▶  $KA < 0$  net giver of assets

## The balance of payments

- ▶ Balance of payments (BOP) accounts are made up of
  1. The current account ✓
  2. The financial account ✓
  3. The capital account ✓
- ▶ Why do we say “balance of payments?”
- ▶ Let’s look at some examples. For each transaction, sort out which **accounts** record the transaction.

## The balance of payments: examples

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- ▶ American in Paris spends €100 (\$110) on hotel; pays with Amex
  - ▶ CA: Hotel room (import of lodging service):  $IM_{US} = \$100$
  - ▶ FA: Hotel claim on AMEX:  $EX_A^{US} = \$100$
- ▶ An American buys \$10,000 of Danone stock; pays w/check drawn on Citi
  - ▶ FA: French stock:  $IM_A^{FR} = \$10,000$
  - ▶ FA: Claim on Citibank:  $EX_A^{US} = \$10,000$
- ▶ U.S. congress forgives \$1 mil. of Haitian debt
  - ▶ KA: U.S. debt forgiveness:  $KA_{OUT} = \$1\text{mil.}$
  - ▶ FA: Export of foreign asset:  $EX_A^{HT} = \$1\text{mil.}$

## Balance of payments: examples

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$$CA = EX - IM + EX_{FS} - IM_{FS} + UT_{IN} - UT_{OUT}$$

$$KA = KA_{IN} - KA_{OUT}$$

$$FA = EX_A^{US} - IM_A^H + EX_A^F - IM_A^F$$

## The balance of payments identity

$$CA + KA + FA = 0$$

- ▶ This is accounting, not theory
- ▶ Ignore the capital account for the moment
- ▶ If  $CA > 0$ ,  $FA < 0$ 
  - ▶ net exporter of goods, services, income
  - ▶ net importer of assets (net addition to external assets)
- ▶ If  $CA < 0$ ,  $FA > 0$ 
  - ▶ net importer of goods, services, income
  - ▶ net exporter of assets (net addition to external liabilities)

US BOP, 2012 (bil. USD)

Flow	Symbol	Value
+ Exports of goods and services	$EX$	2,194
+ Income receipts	$EX_{FS}$	1,564
+ Imports of goods and service	$IM$	-2,734
+ Income payments	$IM_{FS}$	-543
+ Net unilateral transfers	$NUT$	-134
Current account balance	$CA$	-475
+ US-owned foreign assets (net change)	$EX_A^F - IM_A^F$	18
+ Foreign-owned US assets (net change)	$EX_A^H - IM_A^H$	385
Financial Account balance	$FA$	403
Capital account (net)	$KA$	6
Statistical discrepancy		66

## External wealth

- ▶ The financial account measures the addition to a country's foreign assets or liabilities: it is a **flow** variable
- ▶ **Stock** of foreign assets and liabilities determine country's external wealth

external wealth = ROW assets owned in home – home assets owned in ROW

$$W = A - L$$

- ▶ If  $W > 0$  net creditor (lender) to ROW
- ▶ If  $W < 0$  net debtor (borrower) to ROW
  
- ▶ Three terms all mean the same thing: external wealth, net international investment position, net foreign assets

## Changes in external wealth

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- ▶ External wealth changes for two reasons
  1. Trade in assets
  2. Change in the value of assets: *valuation effects* (from change in asset prices or change in exchange rates)

$$\Delta W = -FA + \text{valuation effects}$$

- ▶ By BOP:  $-FA = CA + KA$

$$\Delta W = CA + KA + \text{valuation effects}$$

- ▶ Increase wealth by saving ( $CA > 0$ ), charity ( $KA > 0$ ), capital gains



## US External Wealth in 2012 (billions USD)

	end of of 2011	asset trade	$\Delta$ price	$\Delta$ fx	other	total $\Delta$	end 2012
Ext. assets	16,920	97	991	6	4	1,098	18,018
Ext. liabilities	20,736	544	501	1	157	1,203	21,940
External wealth	-3,187	-446	490	5	-153	-105	-3,922
	$W_{2011}$	$-FA$	valuation effects			$\Delta W$	$W_{2012}$

- ▶ Added \$446 in external liabilities: decrease wealth
- ▶ Capital gains of \$342: increase wealth
- ▶ On net, external wealth decrease