

Chapter 16

National and International Accounts: Income,
Wealth, and the
Balance of Payments

(updated 2/12/08)

Recall from closed economy macro

- **GDP: Gross Domestic Product:** Total value of all final goods and services produced within the borders of a country.
- This can be measured as the value added: sales minus payments for intermediate inputs of all firms.
- We can also measure this as total expenditure on these goods, or total income paid to the country's factors of production:
total production = total expenditure = total income

Accounting In a closed economy

- In a closed economy, expenditure can be decomposed into the categories:

$$GDP = \underbrace{\text{Consumption}}_C + \underbrace{\text{Investment}}_I + \underbrace{\text{Government consumption}}_G$$

total expenditure on final goods and services

- Rewrite this:

$$GDP - C - G = I$$

$$S = I$$

- A conclusion from national income accounting is that in a closed economy the amount of investment in an economy is limited by that country's supply of saving.

Changes for an open economy

- For an open economy, we must consider interactions with the rest of the world in our accounting.
- First, we must account for goods that move across borders:
- Imports (IM) = total value of imports of goods and services
- Exports (EX) = total value of exports of goods and services
- Trade balance (TB = EX – IM) = total value of exports minus imports
 - ♦ TB is also called *net exports*
 - ♦ $TB > 0 \Leftrightarrow$ *trade surplus*
 - ♦ $TB < 0 \Leftrightarrow$ *trade deficit*

GDP identity in an open economy

- New GDP identity for open economy

$$GDP = \underbrace{C + I + G} + \underbrace{(EX - IM)}_{\substack{\text{Trade Balance} \\ \text{(TB)}}$$

- Examples of why the new accounting entries are necessary to make the equality hold:
 - ♦ An imported Toyota truck is counted in C but not in GDP; the negative entry in IM cancels out the positive entry under C
 - ♦ Exported Ford truck is counted in GDP but not in C, I or G domestically; the positive entry in EX provides a way to account for it on the right-hand side of the equation.

Changes for open economies

- A second adjustment is to account for income payments that move across national borders.
- Examples:
 - ◆ Mexican citizens that work in US. Their labor is a type of service import into the US.
 - ◆ Ford auto plant in Mexico. The services provided by US factory and personnel in Mexico are a service export from US
- We can account for this in a measure of total income:
- **GNI: Gross national Income: total value of all income earned by a country's factors of production (without regard to location). This implies:**

$$GNI = GDP + \left[\begin{array}{c} \text{Foreign income payments} \\ \text{to domestic factors} \end{array} \right] - \left[\begin{array}{c} \text{Domestic income payments} \\ \text{to foreign factors} \end{array} \right]$$

Changes for open economies

- This implies

$$GNI = GDP + \underbrace{\left[\begin{array}{c} \text{Foreign income payments} \\ \text{to domestic factors} \end{array} \right]}_{EX_{FS}} - \underbrace{\left[\begin{array}{c} \text{Domestic income payments} \\ \text{to foreign factors} \end{array} \right]}_{IM_{FS}} = \underbrace{\hspace{10em}}_{NFIA}$$

Where we use notation to indicate factor service imports and exports, which sum to net factor income from abroad (NFIA)

So our expenditure equation becomes:

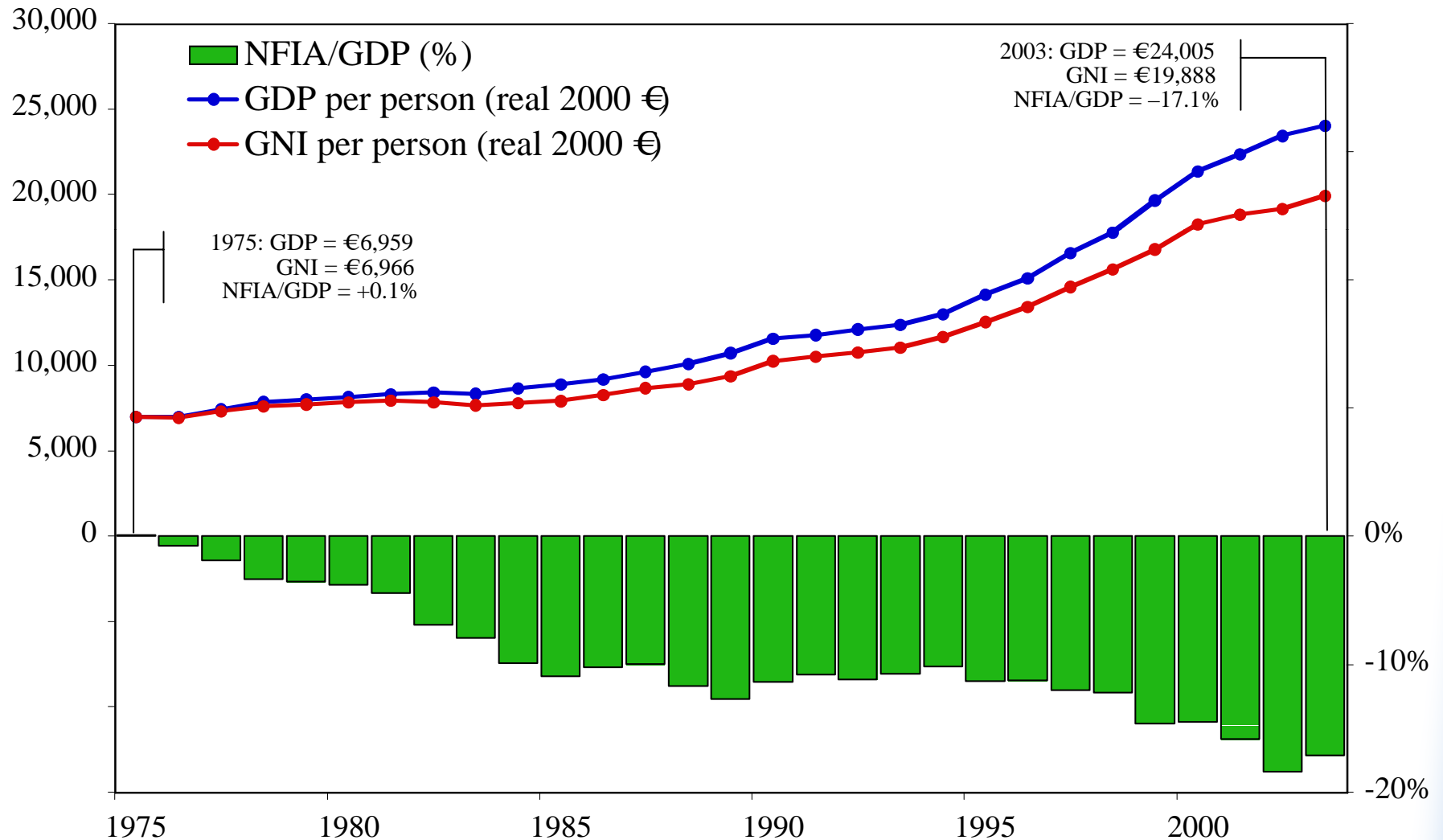
$$GNI = \underbrace{C + I + G}_{GDP} + (EX - IM) + \underbrace{(EX_{FS} - IM_{FS})}_{NFIA}$$

GDP, GNI, and Factor Payments

- Example
 - ◆ The case of Ireland
 - ◆ Many foreign owned factories (Apple, Intel,...)
 - ◆ These factories employ and pay local labor
 - ◆ They also employ foreign capital (and labor)
 - ◆ Payments to these foreign factors are substantial
 - They are counted in Irish GDP (they are paid out of VA of firms in Ireland)
 - But they are not counted in Irish GNI (they are not received by Irish owners of factors, but by foreigners)

GDP versus GNI

CASE STUDY: IRELAND



GDP versus GNI

CASE STUDY: IRELAND

- Ireland has high output (GDP)
- Irish people have much lower income (GNI almost 20% lower)
 - ◆ An extreme case, but it illustrates the key difference between GDP and GNI

Rank	GDP per capita	GNI per capita
1	Luxembourg	Luxembourg
2	United States	United States
3	Norway	Norway
4	Ireland	Switzerland
5	Switzerland	Canada
6	Canada	Denmark
7	Denmark	United Kingdom
8	Netherlands	Netherlands
9	Austria	Belgium
10	Iceland	Iceland
11	Australia	Austria
12	United Kingdom	Australia
13	Belgium	Japan
14	France	France
15	Sweden	Sweden
16	Japan	Finland
17	Finland	Ireland
18	Germany	Germany
19	Italy	Italy
20	Spain	Spain

Including unilateral transfers

- The final thing to account for are transfers of income (gifts) that cross borders.
- Example: US gives foreign aid to Iraq, which Iraq uses to buy US export goods.
- The purchase of exports appears in the accounting equation; must balance it by accounting for the international gift:
- The **net unilateral transfers (NUT)**: international gifts, with negative entry for giving country; positive for receiving country.

GNI versus GNDI

- When we include net unilateral transfers in the income total, we compute the gross national disposable income (GNDI or Y).
- This is the measure of total national income we will use in this course, represented by symbol Y.

$$Y = GNI + NUT$$

What the National Economic Aggregates Tell Us

- When we include unilateral transfers on the right hand side of our accounting equation...

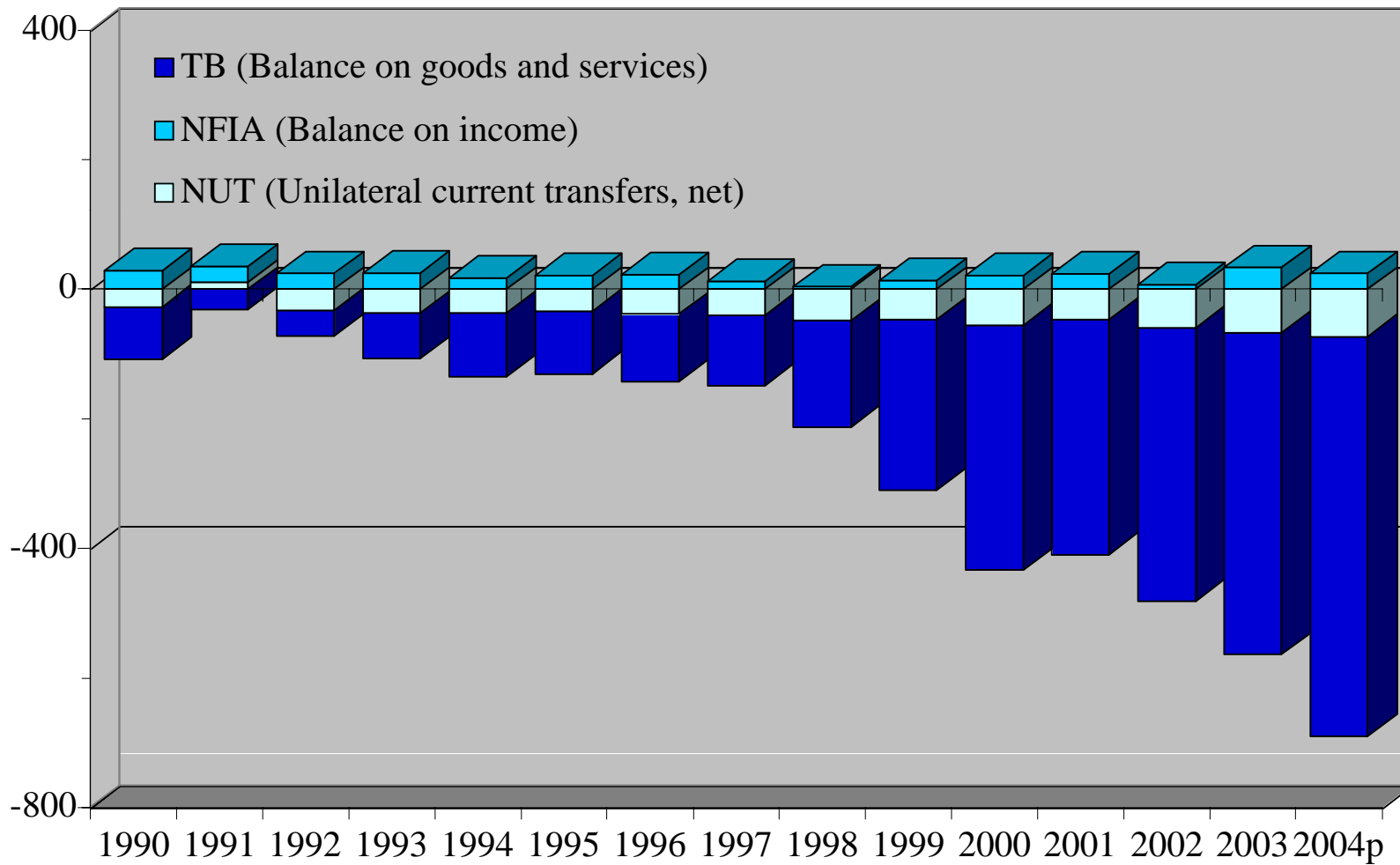
$$Y = C + I + G + \underbrace{\{ \underbrace{(EX - IM)}_{\substack{\text{Trade} \\ \text{Balance} \\ (TB)}} + \underbrace{(EX_{FS} - IM_{FS})}_{\substack{\text{Net Factor Income} \\ \text{from Abroad} \\ (NFIA)}} + \underbrace{(UT_+ - UT_-)}_{\substack{\text{Net Unilateral} \\ \text{Transfers} \\ (NUT)}} \}}_{\substack{\text{Current Account} \\ (CA)}}$$

- We have shown how the last term consists of all international transaction of goods, services, and income.
- This term is sufficiently important that it has a special name: it is called the **current account (CA)**.

US Data for 2004 (www.bea.gov)

<i>Line</i>	<i>Category</i>	<i>Symbol</i>	<i>\$ billion</i>
1	Personal consumption expenditures [consumption]	<i>C</i>	8,230
2	Plus: Gross private domestic investment [investment]	<i>I</i>	1,927
3	Plus: Government expenditures [government consumption]	<i>G</i>	2,184
4	Equals: Gross national expenditure	<i>GNE</i>	12,341
5	Plus: Net exports of goods and services	<i>TB</i>	−606
6	Equals: Gross domestic product	<i>GDP</i>	11,735
7	Plus: Net factor income from the rest of the world	<i>NFIA</i>	44
8	Equals: Gross national income	<i>GNI</i>	11,779
9	Plus: Net unilateral transfers from the rest of the world	<i>NUT</i>	−81
10	Equals: Gross national disposable income	<i>GNDI</i>	11,698

Understanding the Data for the National Economic Aggregates



What the Current Account Tells Us

- The current account plays a central role in this chapter
- **National income identity** (simplest form):

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

- Rewrite: subtract C+G from both sides:

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

- Gives us the **current account identity for an open economy**:

$$S = I + CA \quad \text{or} \quad CA = S - I$$

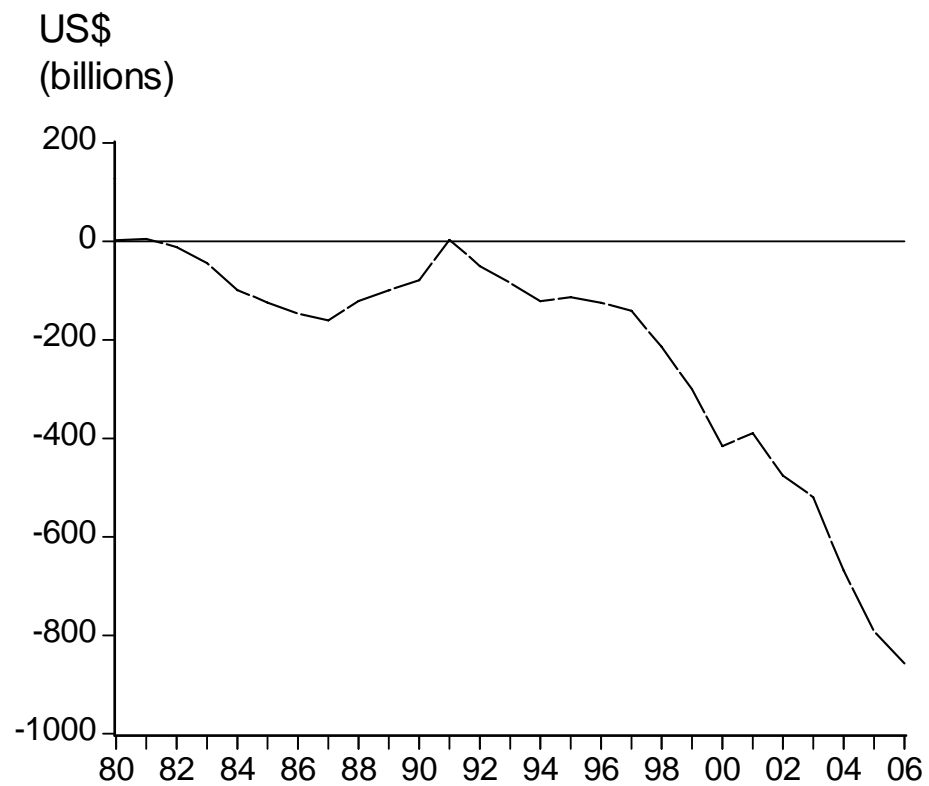
- Note that this is different from the closed economy case (CA=0 and S=I). In an open economy, investment is not limited to the amount of saving in a country.

What the Current Account Tells Us

- What does all this mean? A current account deficit measures how much a country spends in excess of income or—equivalently—how it saves too little relative to its investment needs.
- How is it possible for a country to spend more or less than it earns? Is this a good thing? How long can it go on?
- Consider data on the U.S. case:

US current account balance

Figure 1
U.S. current account



Source: IMF

CASE STUDY of US current account deficit

- Where is the US current account deficit coming from? Some people blame the CA deficit on the government budget deficit.
- 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
 $S^g = T - G$, where T is taxes
 - ◆ **private saving** by households and firms
 $S^p = Y - T - C$

CASE STUDY of US current account deficit

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

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

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

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

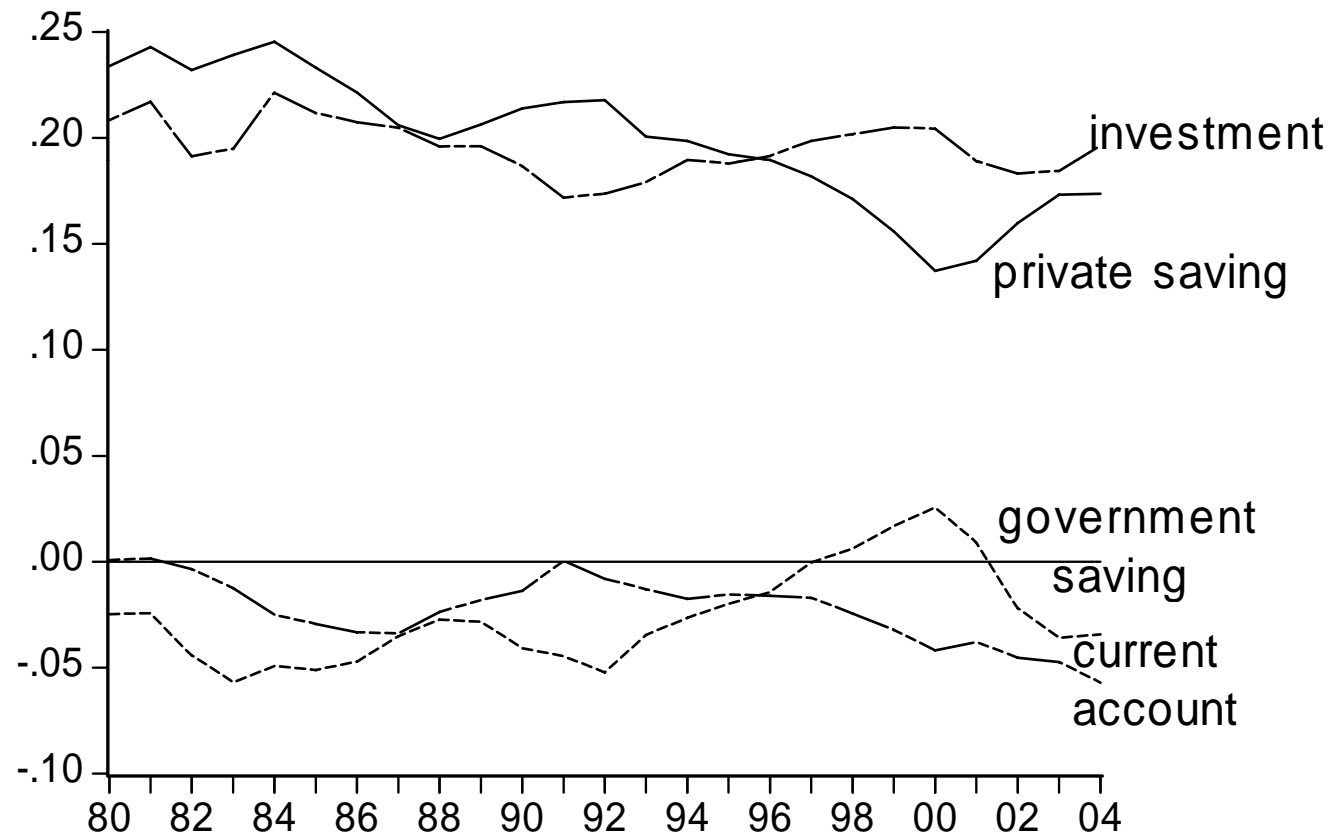
$$= \text{private saving} - \text{government deficit} - I$$

- Implication: All else equal an increase in the government deficit causes an increase in the current account deficit.
Is all else equal?
- In the US data below, which of these components contributes to the CA deficit in the 1980s; which now?

US current account balance

Figure 2
U.S. current account and components

share of GNP



Source: IMF

The Balance of Payments

- Definition: Balance of Payments (BOP): record of transactions with the rest of the world, both trade in goods and assets.
- The **current account (CA)** is one part of the BOP account, tracking flow of real resources between countries
 - ◆ Market flows of goods and services (TB)
 - ◆ Market flows of factor services (NFIA)
 - ◆ Nonmarket flows = transfers (NUT)
- We must also keep track of assets flows used to pay for the trade in goods and services.

The Balance of Payments

- BOP rule 1:
 - ◆ A transaction resulting in a payment to foreigners is recorded as a debit and is given a negative sign. Example: American buys a Rolls Royce from the UK: the import is a debit for US.
 - ◆ A transaction result in a receipt from foreigners is entered as a credit with a positive sign. Example: Queen of England buys a Chevy truck from US: export is a credit for the US.

The Balance of Payments

- BOP rule 2: transactions are put into one of three accounts:
 - ◆ Current account (CA) seen above, for exports and imports of goods and services
 - ◆ Financial account (FA), for export and import of financial assets: bonds, stocks, money, factories, land, ownership of bank accounts, etc.
 - ◆ A third account of little importance for US is capital account (KA): capturing non market transactions, such as write-off of financial debts.

How the Balance of Payments Works

Examples of credits (+ sign):

Current account (CA):

Exports of goods and services

Exports of factor services

Unilateral transfers received

Financial account (FA):

Exports of home and foreign assets

How the Balance of Payments Works

Examples of Debits (minus sign):

Current account (CA):

Imports of goods and services

Imports of factor services

Unilateral transfers given

Financial account (FA):

Imports of home and foreign assets

Financial Account Breakdown by Asset Type

- We Can think of a financial account credit as the export of a financial asset; a financial account debit as the import of an asset
- Use superscripts H and F to denote home and foreign assets:

$$\begin{aligned} FA &= \underbrace{EX_A - IM_A}_{\text{net export of assets}} \\ &= \underbrace{(EX_A^H - IM_A^H)}_{\text{net export of home assets}} + \underbrace{(EX_A^F - IM_A^F)}_{\text{net export of foreign assets}} \end{aligned}$$

The Balance of Payments

- BOP rule 3: every international transactions will imply two BOP entries, one as a credit and one as a debit.
- Example:
 - ◆ If U.S. person buys a Rolls Royce, paying dollars to seller in U.K. This is a debit in U.S. current account.
 - ◆ The British person then must do something with the dollars
 - buy a Chevy with them: is a credit in current account
 - buys stock in U.S. company: is a credit in financial account
 - holds on to U.S. cash - is a U.S. asset, so is a credit in financial account

The Balance of Payments

- Since every transaction gives rise to two offsetting entries in the balance of payments, a current account debit will necessarily be offset by a credit, either in current account, financial account, or the capital account.

- This implies:

$$\underline{CA + KA + FA = 0}$$

This equation is referred to as the Balance of Payments identity; must hold by definition.

Assets and Liabilities

- **From the home perspective:**
- A foreign asset is a claim on a foreign country; if a home entity holds such an asset it is called an **external asset** of the home country
 - ◆ An obligation owed to home by the rest of the world
 - ◆ An example would be when a U.S. firm invest overseas and acquires a computer factory located in Ireland
- Conversely, a home asset is a claim on the home country; if a foreign entity holds such an asset it is called an **external liability** of the home country

Financial inflows

- Recall that the current account is how much more are spending than producing, or saving minus investment.
- If you are spending more than producing, say have a CA deficit, which must finance this somehow.
- We could sell assets in our country to pay for the goods we want. This would generate a financial account credit to balance the current account deficit.
- Or we could issue debt which sell to foreigners, another way of borrowing, and also would be a financial account credit. Can refer to this as a “financial inflow” (also sometimes called a “capital inflow”) to finance the current account deficit.
- So a positive financial account indicates a sale of assets generating a financial inflow to finance a CA deficit.

Understanding the Data for the Balance of Payments Account

- Example:
- US data, 2004
- Again taken from the BEA
- <http://www.bea.gov>
- International Transactions Account (ITA)
 - ◆ Inconveniently, the NIPA and the ITA define the “United States” quite differently!
 - ◆ So the two sets of numbers don’t quite match!

Understanding the Data for the Balance of Payments Account

- US Data appear in this order:
 - ◆ CA items, KA items, FA items (properly signed + or -)
 - with subcategories (some of which are shown here)
 - ◆ Statistical discrepancy (data don't add up to zero!)
 - ◆ Summary items (overall TB, overall CA, overall FA, etc.)

<i>Major account</i>	<i>Line</i>	<i>Category or subcategory</i>	<i>Symbol</i>	<i>\$ billion</i>
<i>Current Account</i>	1	Exports of goods and services	+EX	+1,147
		1a of which: Goods		+808
		1b Services		+340
	2	Income receipts [Exports of factor services]	+EX_{FS}	+369
	3	Imports of goods and services (-)	-IM	-1,764
		3a of which: Goods		-1,473
		3b Services		-291
	4	Income payments [Imports of factor services] (-)	-IM_{FS}	-345
	5	Unilateral transfers, net	NUT	-73

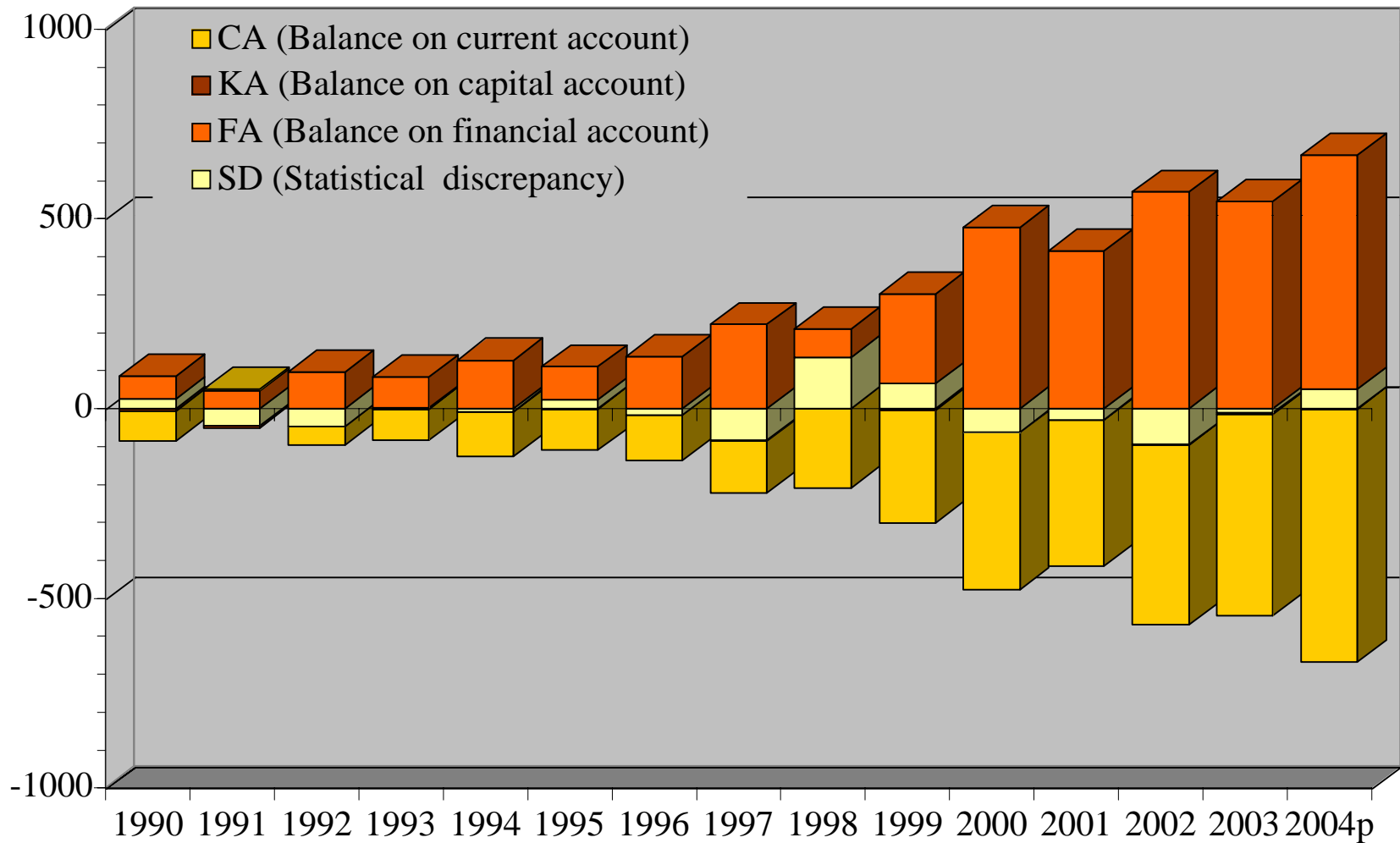
Understanding the Data for the Balance of Payments Account

	6	Capital account, net	<i>KA</i>	-1
<i>Capital and Financial Account</i>	7	U.S.-owned assets abroad, net [change in external assets] increase/financial outflow (-)	$+EX_A^H - IM_A^H$	
	7a	Of which: U.S. official reserve assets		+3
	7b	Other assets		-821
	8	Foreign-owned assets in U.S., net [change in external liabilities] increase/financial inflow (+)	$+EX_A^F - IM_A^F$	
	8a	Of which: Foreign official assets		+355
	8b	Other assets		+1,078
<i>Statistical Discrepancy</i>	9	Statistical discrepancy (sum of 1 to 8, sign reversed)	<i>SD</i>	+52
<i>Summary Items</i>		Balance on current account (lines 1, 2, 3, 4, & 5)	<i>CA</i>	-666
		Of which: Balance on goods & services (lines 1 & 3)	<i>TB</i>	-617
		Balance on income (lines 2 & 4)	<i>NFIA</i>	+24
		Balance on financial account (lines 7 & 8)	<i>FA</i>	+615
		Of which: Official Settlements Balance (lines 7a & 8a)		+358
		Nonreserve Financial Account (lines 7b & 8b)		+257

Official reserves transactions

- Note the accounts include official reserve assets: purchase and sale of foreign currency reserves by central banks.
- This will include attempts by central banks to influence the foreign exchange market seen in last chapter.
- Def: official settlements balance: gap left after summing all non-reserve entries with the CA – the gap that official reserve transacts need to cover for BOP balance.
- The basic logic: suppose private transactions end up with foreigners holding dollars from US exports, more so than the foreign holders want to keep. This excess supply of dollars can lead to fall in value of dollar. So central banks might intervene in the foreign exchange market to buy dollars in exchange for their reserves in other currencies.

Understanding the Data for the Balance of Payments Account



External Wealth

- If FA is nonzero, then (all else equal) asset flows would imply changes in

External wealth (W) = external assets – external liabilities

- But all else is not necessarily equal for assets
 - ◆ Changes in W can be generated by acquisition/disposal of assets
 - ◆ But changes in W can also be generated by changes in the prices of assets (capital gains/losses)
- More accounting needed to keep this straight!

External Wealth

- Definitions

$$\underbrace{\text{external wealth}}_W = \underbrace{\left[\begin{array}{c} \text{ROW assets} \\ \text{owned by home} \end{array} \right]}_A - \underbrace{\left[\begin{array}{c} \text{home assets} \\ \text{owned by ROW} \end{array} \right]}_L$$

- L = what is owed by home to the rest of the world
- A= what is owed by the rest of the world to home.
- W is also referred to as the *net international investment position* or *net foreign assets*.
- If $W > 0$ the home country is a **net creditor** country. The country's external assets exceed its external liabilities.
- If $W < 0$ the home country is a **net debtor** country. The country's external liabilities exceed its external assets.

External Wealth

- Changes in external wealth equal net import of assets, adjusted for capital gains effects:

$$\underbrace{\left[\begin{array}{c} \text{change in} \\ \text{external wealth} \end{array} \right]}_{\Delta W} = \underbrace{\left[\begin{array}{c} \text{capital gains on} \\ \text{external wealth} \end{array} \right]}_{\substack{\text{valuation effects} \\ = \\ \text{capital gains minus capital losses}}} - \underbrace{\left[\begin{array}{c} \text{financial} \\ \text{account} \end{array} \right]}_{\substack{\text{net export of assets} \\ = \\ FA}}$$

- Now use the BOP identity, $CA+KA+FA=0$, to obtain

$$\underbrace{\left[\begin{array}{c} \text{change in} \\ \text{external wealth} \end{array} \right]}_{\Delta W} = \underbrace{\left[\begin{array}{c} \text{capital gains on} \\ \text{external wealth} \end{array} \right]}_{\substack{\text{valuation effects} \\ = \\ \text{capital gains minus capital losses}}} + \underbrace{\left[\begin{array}{c} \text{current} \\ \text{account} \end{array} \right]}_{\substack{CA \\ = \\ \text{net lending}}} + \underbrace{\left[\begin{array}{c} \text{capital} \\ \text{account} \end{array} \right]}_{\substack{KA \\ = \\ \text{net capital transfers received}}}$$

- A simple (obvious?) lesson but it applies nationally:
 - As always, there are 3 ways to get wealthy: windfalls, thrift, or gifts

Understanding the Data on External Wealth

EXCHANGE RATE EFFECTS

Category	Changes in position in 2003						Position, 2003 \$ billion
	Position, 2002 \$ billion	Of which				Total (a+b+c+d)	
		Valuation effects					
		Financial flows (a)	Price changes (b)	Exchange- rate changes (c)	Other changes (d)		
<i>(i) External Assets</i>							
U.S.-owned assets abroad	6,613	283	677	469	-178	1,251	7,864
of which: U.S. official reserve assets	159	-1	18	8	0	25	184
U.S. Government assets, other	85	0	0	85
U.S. private assets:	6,369	285	659	460	-178	1,226	7,596
<i>(ii) External Liabilities</i>							
Foreign-owned assets in the United States	9,167	829	690	71	-242	1,348	10,515
of which: Foreign official assets in the U.S	1,213	249	4	9	261	1,474
Other foreign assets:	7,954	581	686	71	-251	1,086	9,041
<i>(iii) External Wealth</i>							
Net international investment position of the U.S.	-2,553	-546	-14	398	64	-98	-2,651
<i>Symbol</i>	W (last period)	-FA	capital gains		ΔW	W (this period)	

Understanding the Data on External Wealth

“MANNA FROM HEAVEN”?

