1st fundamental accounting identity

- With all variables being real, the fundamental national income accounting identity states that

$$\underbrace{Y}_{\text{ex-post supply of output}} \equiv \underbrace{C + I + G + NX}_{\text{ex-post demand for output}}.$$

C = consumption spending by households
I = investment spending by firms and households
G = government purchases of goods
NX = net exports of goods = exports – imports
EX IM

2nd fund. accounting identity/v1

- T = taxes paid by households and firms
- TR = transfers paid to households and firms
- S = private saving (saving by households & firms)
- $C + S \equiv Y_D$ (disposable income) $\equiv Y + TR - T$
- By adding $TR - T$ to each side of $Y \equiv C + I + G + NX$ and rearranging, the following identity obtains:

$$\underbrace{I}_{\text{investment}} \equiv \underbrace{S}_{\text{private saving}} + \underbrace{(T - TR - G)}_{\text{government saving}} + \underbrace{(IM - EX)}_{\text{foreign saving}}.$$

2nd fund. accounting identity/v2

- The identity says that domestic investment must be financed by private saving, public saving, or foreign saving. It can also be expressed as follows:

$$\underbrace{(S - I)}_{\text{net private saving}} \equiv \underbrace{(G + TR - T)}_{\text{government budget = = spending – receipts (can also be defined the other way round)}} + \underbrace{NX}_{\text{trade balance or net exports}}.$$

budget surplus if $T > G + TR$
budget deficit if $T < G + TR$

lending capacity = trade surplus if $NX > 0$; trade deficit if $NX < 0$

financial need

Where do savings go?

- The identity can also be formulated as

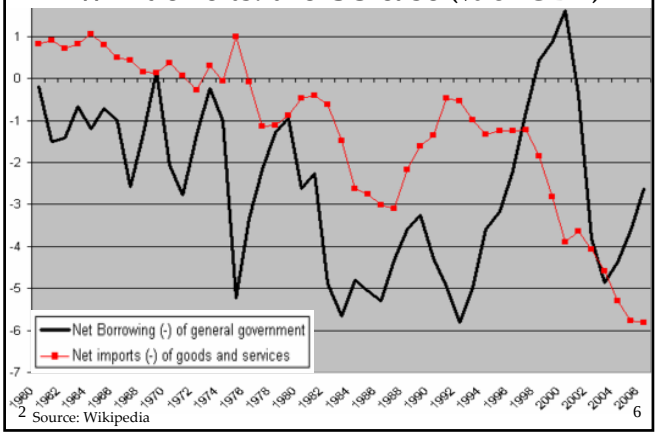
$$S \equiv I + (G + TR - T) + NX.$$

- This says that there are three ways of disposing of the savings of an economy.
- Savings can go to firms to finance investment…
- … to the government to finance a budget deficit…
- … or to foreigners, when they buy more from the economy than the economy buys from them.

Twin deficits: twice the fun

- If investment equals savings, so $I = S$, the 2nd identity (version 2) implies that the government budget deficit equals the trade balance.
- This means that if the government runs a budget deficit, then it must be financed by foreigners: if $I = S$, then $G + TR - T > 0$ implies $NX < 0$.
- In sum, the government spends more without having to increase taxes and the rest of members of the economy buy from abroad more goods than they sell; see the US case during the 80s and 90s.

Twin deficits: the US case (% of GDP)



Source: Wikipedia

From expenditure to GDP

- According to national income accounting, GDP equals expenditure, income, and value added.
- The expenditure approach to measure GDP splits GDP into four components (*C*, *I*, *G*, and *NX*) according to the identity of the purchaser (or according to the purpose of the expenditure).
- The expenditure approach leads to the identity $Y \equiv C + I + G + NX$: everything that is produced is purchased by consumers to be consumed, by firms to be invested, by the government, or by foreigners. Hence, production ≡ expenditure.

GDP, Spain, expenditure approach

	2010Q1	2010Q2	2010Q3
C	153.3	156	156.5 (61.1%)
I	65.3	62.9	51.8 (20.2%)
G	46.2	58.4	48.7 (19%)
EX	62.3	70.1	72.5 (28.33%)
IM	70	76.2	73.6 (–28.76%)
GDP	257.3	271.5	255.9 (100%)

Source: INE

billions of €

From income to GDP

- The income approach to measure GDP obtains GDP as the sum of the payments made to all the factors of production (inputs).
- Inputs are aggregated into two categories: labour (workers) and capital (firms). The government is a third category, because it collects taxes.
- The income approach leads to the identity $Y \equiv$ wages + profits + taxes: everything that is produced becomes the income of workers (wages), of firms (profits), or of the government (taxes). Summing up, production ≡ income.

GDP, Spain, income approach

	2010Q1	2010Q2	2010Q3
wages	119.7	132.3	121.3 (47.4%)
profits	109.8	118.2	110 (42.9%)
taxes	27.7	20.9	24.6 (9.61%)
GDP	257.3	271.5	255.9 (100%)

Source: INE

billions of €

From value added to GDP

- The value added approach to measure GDP views GDP as the sum of the value that each producer adds to the production purchased by the producer.
- If the reprographic industry buys paper worth 100 and energy worth 200 to make copies worth 600, then the added value of the industry is 600 – 200 – 100 = 300. If that value were 600, the production of paper and energy would be counted twice.
- Value added = value of the final (new) goods produced – value of the intermediate goods. In this case, production ≡ total value added.

GDP, Spain, value added approach

	2010Q1	2010Q2	2010Q3
Agriculture &c.	5.4	8.1	5.1 (2%)
Energy	6.7	7.1	7.3 (2.8%)
Industry	30.7	30.3	28.2 (11%)
Construction	22.3	24.4	24.6 (9.6%)
Services	166.1	182.1	167.6 (65.4%)
Taxes	25.8	19.3	22.8 (8.9%)
GDP	257.3	271.5	255.9 (100%)

Source: INE

billions of €