Gross Domestic Product

Aggregates expenditure
Total expenditure on final goods and services equals the value of output of final goods and services, which is GDP.

\[ \text{Total expenditure} = C + I + G + (X - M). \]

Aggregate income
Aggregate income earned from production of final goods, \( Y \), equals the total paid out for the use of resources, wages, interest, rent, and profit.

Firms pay out all their receipts from the sale of final goods, so income equals expenditure,

\[ Y = C + I + G + (X - M). \]
Financial Flows

Financial markets finance deficits and investment.

Household saving, $S$, is income minus net taxes and consumption expenditure, and flows to the financial markets;

\[ Y = C + S + T, \]

income equals the uses of income.

Rewrite

\[ S = Y - C - T \]

redefinition of savings

Remember it!
How Investment Is Financed

Investment is financed from three sources:

- Private saving, $S$
- Government budget surplus, $(T - G)$
- Borrowing from the rest of the world $(M - X)$

We can see these three sources of investment finance by using the fact that aggregate expenditure equals aggregate income.

Start with

$$Y = C + S + T = C + I + G + (X - M)$$

Then rearrange to obtain

$$I = S + (T - G) + (M - X)$$

Private saving $S$ plus government saving $(T - G)$ is called national saving.
How can the U.S. grow really fast?

\[ \Delta k = I = S + (T - G) - (X - M) \]

two rules:

- Encourage savings:

\[ \frac{\Delta k}{k} = \text{large} \]

- by households: \( S \)
- by the public sector: \( (T - G) \); also \( G \rightarrow k \)
- by "foreigners": \( (X - M) \); also \( N = \text{net} \)

Encourage innovation:

\[ \frac{\Delta Y}{Y} = \frac{\sigma T}{T} + a \frac{\Delta N}{N} + (1 - a) \frac{\Delta k}{k} \]
Gross Private Savings; Billions of Dollars SAAR

Gross Private Domestic Investment; Billions of Dollars SAAR

Source of Real Gross Investment ($I$)

\[ I = S + (I - G) - (X - M) \]

1830 = 1380 ↑ ↑ next page
Total Government Surplus or Deficit; Billions of dollars SAAR

Balance of Payments: Balance on Current Account; SA

\[
I = S + (T - C) - (X - M)
\]

\[
1830 = 1380 + 320 + 110
\]

discernability 2000/12/31
Shown: \[ Y = C + I + G + (X-M) \]

Definition:
\[ S = (Y-T) - C \]

Therefore:
\[ C = (Y-T) - S \]

Therefore:
\[ Y = (Y-T) - S + I + G + (X-M) \]

Therefore:
\[ S + T + N = I + G + X \]

Therefore:
\[ S = I + (G-T) + (X-N) \]

Fiscal deficit  
Trade deficit  
"Twin deficits"
Gross Domestic Product

• Gross Investment
  • The total amount spent on adding to the stock of capital and on replacing depreciated capital

• Net Investment
  • The amount spent on adding to the stock of capital
    • Gross Investment minus Depreciation

\[ Y = C + I + G + X - M \]
Gross investment is the total amount spent on purchases of new capital and on replacing depreciated capital.

Net investment is the change in the stock of capital and equals gross investment minus depreciation.

Gross and Net Domestic Product

"Gross" means before accounting for the depreciation of capital. The opposite of gross is net.

To understand this distinction, we need to distinguish between flows and stocks in macroeconomics.

A flow is a quantity per unit of time; a stock is the quantity that exists at a point in time.
**Stocks and Flows**

- The water in the tub is a "stock" of water.
- Open the faucet: additional water.
- Open the drain: "used water".

\[ \Delta k = NI = GI - D \]

**Net Investment**

A bathtub.

["Capital", "GI", "Depreciation"]
More acronyms

1. GOP
   Depreciation
   ____________
   NDP
   G: gross
   N: net

2. GI
   Depreciation
   _______
   NI
   Gross Investment
   Net Investment

3. NI = \Delta K
   \sum_{t = 1976}^{t = 1978} NI = \sum_{t = 1976}^{t = 1978} \Delta K = K_t

\Delta K = "a flow"  \quad K_t = a "stock"
In the circular flow of income and expenditure, households receive incomes (Y) from firms (blue flows) and make consumption expenditures (C); firms make investment expenditures (I); governments purchase goods and services (G); the rest of the world purchases net exports (NX)—(red flows). Aggregate income (blue flow) equals aggregate expenditure (red flows). Households' saving (S) and net taxes (T) leak from the circular flow. Firms borrow to finance their investment expenditures, and governments and the rest of the world borrow to finance their deficits or lend their surpluses (green flows). The values shown are for 1998.


a. Aggregate expenditure.
b. Aggregate income.
c. GDP.
d. Government budget deficit.
e. Household saving.
f. Government saving.
g. Foreign borrowing.
h. National saving.