

5. Sectoral basic identity and savings identity

1. The three-sector division of an economy

An economy can be divided into three sectors: (i) the domestic private sector (households, firms and banks); (ii) the domestic government sector (local, regional, and national governments); and (iii) the foreign sector (the private and the government sectors of the rest of the world)

2. Sectoral balance

Income flows and spending flows run within each sector and between sectors. Over a given period of time, a sector

- runs (or has) a surplus if the sector's spending flow is smaller than the sector's income flow over the period;
- runs (or has) a deficit if the sector's spending flow is larger than the sector's income flow over the period.
- is balanced if its spending flow is equal to its income flow over the period.

3. Financial wealth

The net financial wealth of an economic agent (household, firm, government...) is the difference between the agent's financial wealth (value of all the financial assets the agent has purchased) and the agent's financial liabilities (the value of all the financial assets the agent has issued).

4. Financial wealth and sectoral balance

A sector's net financial wealth is the sum of the net financial wealth of all the economic agents in the sector. The balance of a sector is the sector's net financial wealth. The balance is positive (or is in surplus) if the net financial wealth is positive (value of financial assets larger than value of liabilities). The balance is negative (or is in deficit) if the net financial wealth is negative.

5. Sectoral surplus and sectoral deficit

If a sector runs a surplus, then, in net terms, the sector generates a saving flow. This saving flow accumulates to a stock that takes the form of a net accumulation of financial assets, that is, an increase in the sector's net financial wealth. When a sector has a positive net financial wealth some agent in the sector has a claim on some other agent from another sector; for instance, a household owns a government bond issued by the government. If a sector runs a deficit, then the sector reduces its net financial wealth: the sector generates a dissaving flow. When a deficit occurs, the sector sells previously accumulated financial assets or creates (issues) new financial assets. A sector finances its deficit by decumulating financial assets.

6. Flows, stocks and basic principle of accounting

Flows determine whether a deficit or a surplus occur. Stocks represent accumulation or decumulation of debts. The basic principle of accounting states that for every financial asset there is an equivalent financial liability. Accordingly, someone's liability is always somebody else's financial asset.

7. Sectoral basic identity or macroeconomic balance equation

The three-sector basic identity states that the sum of the balances of all sectors is zero:

$$\text{Domestic Private Balance} + \text{Domestic Government Balance} + \text{Foreign Balance} \equiv 0.$$

The sectoral identity implies that a sector's deficit must be offset by some sector's surplus. In particular, for a sector to accumulate net financial wealth, some other sector must increase its indebtedness. It is therefore impossible for the three sectors to simultaneously run a surplus.

8. Accumulation of financial wealth by the private sector

The private sector must run a surplus to accumulate financial wealth. By the sectoral identity,

$$\text{Private Surplus} \equiv \text{Public Deficit} + \text{Balance of Payments Surplus}.$$

Public deficits and balance of payments surpluses create income and financial assets for the private sector. A public deficit is financed by issuing financial assets; by buying those assets, the private sector increases its net financial wealth. A balance of payments (current account) surplus means that the private sector finances the rest of the world, which is a source of income for the private sector. Analogously, public surpluses and balance of payments deficits withdraw income from the private sector and destroy financial assets held by the private sector:

$$\text{Private Deficit} \equiv \text{Public Surplus} + \text{Balance of Payments Deficit}.$$

9. Wynne Godley (1926-2010)

Orthodox economists did not predict nor anticipate the Great Recession that started in 2007-08. They claimed in their defense that no one saw it coming. But some did. Wynne Godley, a heterodox economist, issued warnings, using models based on the sectoral identity, that the unprecedented US expansion of the 1990s was doomed. He noticed that, at the time, relative to GDP, private sector deficit was five times larger than anything achieved previously and was being sustained for longer than in the past. Further economic expansion would raise the government surplus in the presence of a growing foreign deficit. The balance identity implies that the private deficit should worsen to unsustainable levels. GDP will stop growing once private spending no longer increases faster than private income. As soon as this occurs, public surplus will turn into a deficit and private deficit into a surplus. This is exactly what happened.

Wynne Godley; Alex Izurieta (2002): "The case for a severe recession," Challenge 45(2), 27-51.

Wynne Godley; L. Randall Wray (2000): "Is Goldilocks Doomed?," Journal of Economic Issues 34(1), 201-206.

10. Causality

Causality relationships cannot be derived from the sectoral identity. For instance, if the foreign balance is zero, there is a priori no way of telling whether it was the government deficit that caused the net accumulation of financial wealth by the private sector or the private accumulation that caused the government deficit.

11. Causation at the individual level

At least in the private sector, causation for individuals is very likely to run from income to expenditure. If some household (or firm) plans to run a deficit by spending above its income

level, then it can issue financial assets to finance the difference between expenditure and income. Some other agent that chooses to save will purchase the financial assets, thereby accumulating as financial wealth the liability generated by the agent that runs the deficit. Thus, the decision to spend in excess gives rise to financial wealth: deficits create financial wealth.

12. Causation at the aggregate level

For the economy as a whole it does not seem possible to decide to have more income, but it is to choose to spend more. Any additional spending is necessarily received as additional income by someone. By the sectoral identity, aggregate spending equals aggregate income. That is why the heterodox view in macroeconomic theory tends to support the idea that income causes spending at the individual level but spending cause income at the aggregate level.

13. The savings identity

The sectoral identity takes into account all the monetary flows in an economy. An apparently close approximation can be obtained by considering the flows associated with GDP. This gives rise to the savings identity, which states that

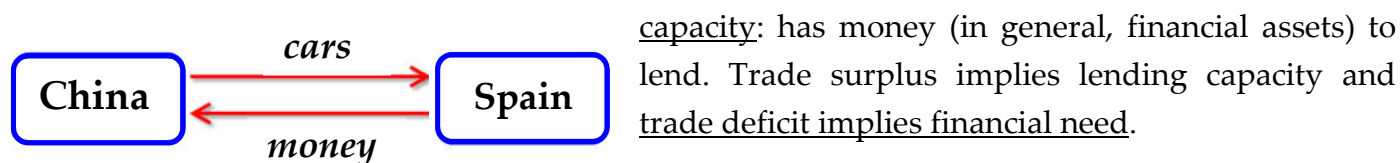
$$\text{Net Private Savings} + \text{Government (or Public) Savings} + \text{Foreign Savings} = 0$$

where:

- (i) Net Private Savings = Private Savings – Investment = $S - I$;
- (ii) Government Savings = Taxes – Government Purchases – Transfer Payments = $T - G - TR$;
- (iii) Foreign Savings = Imports – Exports = $IM - EX$.

14. Why $IM - EX$ represents foreign savings

Imagine that China exports only cars to Spain and that China imports nothing from Spain, as depicted below. China runs a trade surplus with Spain and Spain a trade deficit with China. China delivers goods and receives in exchange money. Thus, China is saving and has lending



capacity: has money (in general, financial assets) to lend. Trade surplus implies lending capacity and trade deficit implies financial need.

15. Expenditure categories

National income accounting assigns the value of each good produced to one of four categories (all nominal or all real) according to the type of agent that has received the good.

- **Consumption expenditures or, for short, consumption C.** Consumption C is the value of the purchases of new goods (durable and non-durable) and services by households (no matter in which economy the goods have been produced).

- **Gross private domestic investment or investment I.** Investment I consists of the value of:

- (i) fixed investment (on new factories, office buildings, and machinery to produce goods);
- (ii) residential investment (spending by households or firms on new homes); and
- (iii) changes in the firms' inventories (goods that have been produced but not sold yet).

- **Government consumption and gross investment or government purchases G.** Government purchases G is spending by all levels of government (local, regional, national) on newly produced goods and services. It includes consumption and investment spendings.
- **Transfer payments TR.** Transfer payments TR are payments by the government without receiving anything in return. Typical transfer payments are Social Security payments to retired and disabled people and unemployment insurance to unemployed people. Transfer payments are excluded from government purchases.
- **Exports EX.** Exports EX are the value of the exports of goods and services.
- **Imports IM.** Imports IM are the value of the imports of goods and services.

16. Foreign balance

Net exports NX are defined as exports minus imports: $NX = EX - IM$. The difference “exports minus imports” is also known as trade (or foreign) balance. A trade surplus occurs when exports are greater than imports, so net exports are positive: $NX > 0$. A trade deficit occurs when imports are greater than exports, which means that $NX < 0$.

17. Government budget

Designating by **T** the taxes paid by households and firms to the government, the government budget (or public deficit) is $PD \equiv G + TR - T$ and equals the government’s spending on goods and services plus transfer payments minus the government’s tax receipts. A budget (or public) deficit occurs if $PD > 0$: that is, spending is larger than receipts. A budget (or public) surplus occurs if $PD < 0$. The government budget is balanced if $DP = 0$. Public savings is $-DP$ or, equivalently, $T - G - TR$. Public debt is the accumulation of past deficits.

18. Fundamental macroeconomic identity

The fundamental macroeconomic identity asserts that the ex-post aggregate supply of output (that is, GDP **Y**) equals the ex-post aggregate demand for output. Formally:

$$Y \equiv C + I + G + EX - IM.$$

Imports **IM** are subtracted because they have been included already in **C**, **I**, or **G**. The identity just tells who makes use of the total production $Y + IM$ available in the economy: households, firms, government, or foreigners (so $Y + IM \equiv C + I + G + EX$).

19. Example on the fundamental macroeconomic identity

A new car is available in an economy. If the car has been produced within the economy, the value of the car is included in **Y**; if it has been produced abroad, its value is added to **IM**. Who gets the car determines the category **C**, **I**, **G** or **EX** in which the value of the car must be placed.

- If a household purchases the car, its value appears in **C**.
- If a firm buys the car to use it in production activities (a leasing car company, for instance), then the value of the car is in **I**.
- If some public organization gets the car, then its value is included in **G**.

- (iv) If someone from another economy obtains the car, then its value counts as **EX**.
- (v) If the car is produced domestically and no one purchases it, then its value is residually assigned to **I**: the firm that produced the car is attributed involuntary investment.

20. The income identity

The income accounting identity establishes how income is used and asserts that

$$Y \equiv C + S + (T - TR).$$

Interpreting GDP Y as aggregate income (GDP as net incomes earned by the factors of production), then the income identity states that income can be used to consume, to save, and to pay taxes (taxes net of transfers). Disposable income Y_d is defined as $Y_d \equiv Y - T + TR$. By combining this and identity $Y \equiv C + S + (T - TR)$, it follows that $Y_d \equiv C + S$.

21. The savings identity (new version)

By the fundamental identity, $Y - C \equiv I + G + NX$. By the income identity, $Y - C \equiv S + T - TR$. Combining the two yields $I + G + NX \equiv S + T - TR$. Rearranging, the following expression of the savings identity is obtained:

$$\underbrace{S}_{\text{private saving}} \equiv \underbrace{I}_{\text{investment}} + \underbrace{(G + TR - T)}_{\text{government budget deficit}} + \underbrace{NX}_{\text{trade balance}}$$

This identity tells that there are three ways of disposing of the savings of an economy. Each part of 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 (the economy runs a trade surplus, so the rest of the world runs a trade deficit with the economy).

22. The investment identity

Solving for I in the savings identity, the investment accounting identity below obtains. The investment identity holds that investment is financed by private saving S , public saving $T - G - TR$ or foreign saving $-NX$.

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

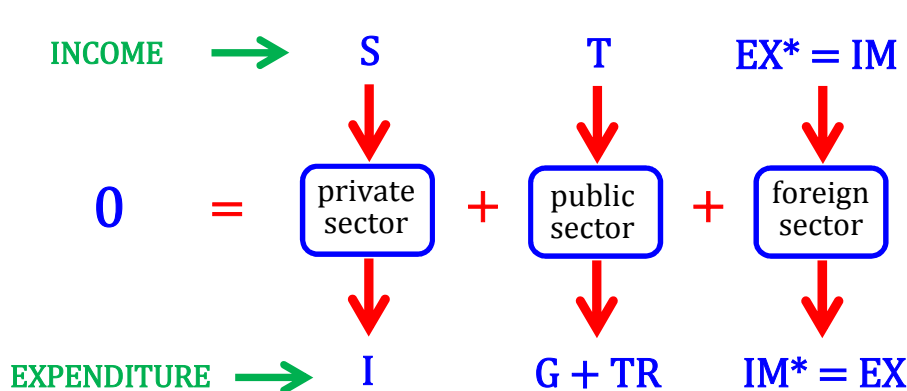
23. Twin deficits

Suppose investment equals savings: $I = S$. By the savings identity, the public deficit $G + TR - T$ equals the trade balance NX . 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, government and trade deficits simultaneously occur. As a result, the government spends more without having to increase taxes, and households and firms buy from abroad more goods than they sell. Can it be concluded that all of them live beyond their possibilities?

24. Sectoral identity and savings identity

The following GDP-based version of the balance identity is obtained by moving I to the right-hand side of the investment identity:

$$(S - I) + (T - G - TR) + (-NX) \equiv 0.$$



The sketch on the left shows the savings identity as a sectoral identity. First, $S - I$ is the private sector balance. The private sector runs a surplus if $S - I > 0$, that is, when savings exceed investment. Second, $T - G - TR$ represents the public sector balance. The public

sector runs a surplus if $T - G - TR > 0$, that is, if public revenue exceeds public spending. And third $-NX$ captures the foreign sector balance. The foreign sector runs a surplus if $-NX > 0$, that is, if $-(EX - IM) > 0$ or, equivalently, if $IM > EX$. This situation means that $EX^* > IM^*$, where the asterisk ascribes the variable to the rest of the world. Since $EX^* > IM^*$ implies that the rest of the world has lending capacity, it follows that $-NX > 0$ is equivalent to the revenue of the rest of the world being larger than the spending of the rest of the world. For this reason, $-NX > 0$ describes a foreign sector surplus and that the rest of the world have positive savings. Summarizing:

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

private surplus \equiv public deficit + trade surplus

25. Net borrowing and net lending

A sector runs a deficit when it has an excess of expenditure over income. To finance the deficit, net borrowing is needed: the sector must increase liabilities more than it increases financial assets. In (1) below, which represents the savings identity, each difference within parentheses measures the net borrowing of the sector. By changing its sign, net borrowing is transformed into net lending (which means net acquisition of financial assets). A sector generates net lending when the sector's income exceeds the sector's expenditure. Foreign net borrowing (the rest of the world's inflows minus outflows) is the reverse of domestic net lending.

$$(\text{Private Expenditure} - \text{Private Income}) + (\text{Government Expenditure} - \text{Government Income}) + (\text{Inflows from the rest of the world} - \text{Outflows to the rest of the world}) = 0 \quad (1)$$

26. Impact on economic activity

Each difference within parentheses in (1) can be viewed as the sector's contribution to aggregate demand. A positive difference implies a demand expansion, whereas a negative difference implies a demand contraction. Economic activity is therefore held down by any sector whose difference expenditure–income is negative. Consequently, expansions of investment, of public spending or of exports contribute to push up economic activity.