

L. RANDALL WRAY

MODERN MONEY THEORY



THIRD EDITION

A Primer on Macroeconomics for
Sovereign Monetary Systems



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L. Randall Wray

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A Primer on Macroeconomics for Sovereign
Monetary Systems

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CHAPTER 1

The Basics of Macroeconomic Accounting

In this chapter we are going to begin to build the necessary foundation to understand modern money. Please bear with us. It may not be obvious at first why this is important. But you cannot possibly understand the debate about the government's budget (and critique the deficit hysteria that typically grips most nations) without understanding basic macro accounting. Nor can you understand the problems in Euroland—which have to do with the set-up of its monetary system, not with the supposed profligate spending of lazy Greeks, Spaniards, and Italians. So be patient and pay attention. No higher math or knowledge of intricate accounting rules will be required. This is simple, basic stuff. It is a branch of logic. But it is extremely simple logic.

1.1 THE BASICS OF ACCOUNTING FOR STOCKS AND FLOWS

1.1.1 *One's Financial Asset Is Another's Financial Liability*

It is a fundamental principle of accounting that for every financial asset there is an equal and offsetting financial liability. The checking deposit (also called a demand deposit or a sight deposit) is a household's financial asset, offset by the bank's liability (or IOU). In other words, the deposits are household assets and the bank's liability. A government or corporate

bond is a household asset but represents a liability of the issuer (the government or the corporation). The household has some liabilities, too, including student loans, a home mortgage, or a car loan. These are held as assets by the creditor, which could be a bank or any of a number of types of financial institutions such as pension funds, hedge funds, or insurance companies. A household's net financial wealth is equal to the sum of all its financial assets (equal to its financial wealth) less the sum of its financial liabilities (all of the money-denominated IOUs it issued). If that is positive, it has positive net financial wealth.

1.1.2 Inside Wealth Versus Outside Wealth

It is often useful to distinguish among different types of sectors in the economy. The most basic distinction is between the public sector (including all levels of government) and the private sector (including households and firms). If we were to take all of the privately issued financial assets and liabilities, it is a matter of logic that the sum of financial assets must equal the sum of financial liabilities. In other words, net private financial wealth would have to be zero if we consider only private sector IOUs (unless the government is holding some of the private debt). This is sometimes called “inside wealth” because it is “inside” the private sector. In order for the private sector to accumulate net financial wealth, it must be in the form of “outside wealth”, that is, financial claims on another sector. Given our basic division between the public sector and the private sector, the outside financial wealth takes the form of government IOUs. The private sector holds government currency (including coins and paper currency) as well as the full range of government bonds (short-term bills, longer maturity bonds) as net financial assets, a portion of its positive net wealth.

1.1.3 A Note on Nonfinancial Wealth (Real Assets)

One's financial asset is necessarily offset by another's financial liability. In the aggregate, net financial wealth must equal zero. However, real assets represent one's wealth that is not offset by anyone's liability; hence at the aggregate level net wealth equals the value of real (nonfinancial) assets. To be clear, you might have purchased an automobile by going into debt. Your financial liability (your car loan debt) is offset by the financial asset held by the auto loan company (your IOU is often called the “note”—a promise to pay). Since those net to zero, what remains is the value of the

real asset—the car. In most of the discussion that follows, we will be concerned with financial assets and liabilities, but will keep in the back of our minds that the value of real assets provides net wealth at both the individual level and the aggregate level. Once we subtract all financial liabilities from total assets (real and financial) we are left with nonfinancial (real) assets or aggregate net worth. (See the discussion below in Sect. 1.6.)

1.1.4 *Net Private Financial Wealth Equals Public Debt*

Flows (of income or spending) accumulate to stocks (see Sect. 1.3). Private sector accumulation of net financial assets over the course of a year is made possible only if its spending is less than its income over that same period. In other words, saving enables accumulation of a stock of wealth in the form of financial assets. In our simple example with only a public sector and a private sector, these financial assets are government liabilities—government currency and government bonds.

Government IOUs, in turn, are accumulated by the private sector when the government spends *more* than it receives in the form of tax revenue. This is a government deficit, which is the flow of government spending less the flow of government tax revenue measured in the money of account over a given period (usually a year). This deficit accumulates to a stock of government debt—equal to the private sector’s accumulation of financial wealth over the same period.

A complete explanation of the process of government spending and taxing will be provided later. What is necessary to understand at this point is that the net financial assets held by the private sector are exactly equal to the net financial liabilities issued by the government in our two-sector example. If the government always runs a *balanced budget*, with its spending always equal to its tax revenue, the private sector’s net financial wealth will be zero. If the government runs continuous budget surpluses (spending is less than tax receipts), the private sector’s net financial wealth must be negative, with the private sector indebted to the public sector.

We can formulate a resulting “dilemma”: in our two-sector model it is impossible for both the public sector and the private sector to run surpluses. And if the public sector were to run surpluses, by identity the private sector would have to run equal deficits. If the public sector were to run sufficient surpluses over some period to retire all its outstanding debt, by identity the private sector would run equivalent deficits, running down its net financial wealth until it reached zero and then turned negative as government accumulates claims on the private sector.

1.1.5 *Rest of World Debts Are Domestic Financial Assets*

Another useful division is to form three sectors: a domestic private sector, a domestic public sector, and a “rest of the world” (ROW) sector that consists of foreign governments, firms, and households. In this case, it is possible for the domestic private sector to accumulate net claims on the ROW, even if the domestic government sector runs a *balanced budget*, with its spending over the period exactly equal to its tax revenue. The domestic private sector’s accumulation of net financial assets in that case is equal to the ROW’s issue of net financial liabilities.

Finally, the domestic private sector can accumulate net financial wealth consisting of both domestic government liabilities and ROW liabilities. And, it is possible for the domestic private sector to accumulate government debt (adding to its net financial wealth) while also issuing debt to the ROW (reducing its net financial wealth). In the next section we turn to a detailed discussion of sectoral balances.

1.1.6 *A Note on the Importance of Inside Assets*

Some critics have claimed that Modern Money Theory (MMT) ignores inside assets as it emphasizes net financial wealth. This is not true. MMT *has* tried to focus attention on the source of the private sector’s net financial assets—or outside wealth—because there is so much confusion about the desirability of government deficits. We insist that in a closed economy, the only source of net financial assets is the government; in an open economy, claims on the rest of the world are another source. However, the domestic private sector—by itself—cannot create net financial assets since every financial asset created and held within that sector is offset by a liability within the sector.

But that does not mean that the domestic private sector’s creation of financial assets and liabilities should be ignored. Of course, it matters *who* is in debt and *who* is the creditor. Generally, the business sector goes into debt in order to expand capacity to make profits. The household sector goes into debt to buy houses and consumer products; however, the household sector generally is a net creditor as it accumulates net financial assets—to save for college and retirement, for example. If we look within these subsectors, we find that some segments are heavily indebted while others are net creditors. For example, we find that households headed by older people are net creditors while those headed by younger people are net debtors. In the United States, we find heavy concentrations of

financial wealth among White households and small accumulations of financial wealth among Black and Hispanic households. And we find rising concentrations of financial assets among the richest 1 percent—especially during the COVID pandemic as wealth accumulation at the top accelerated.

All of these issues are important and have been increasingly studied over the past three decades. Rising household indebtedness in the United States and in much of Europe contributed to the Global Financial Crisis. Rising concentrations of wealth in the hands of the few have raised enormous problems for Western democracies. Borrowing by firms to finance speculation (and stock buybacks) rather than productive investment has burdened firms with debt without increasing their ability to profit from production. All of these issues have to do with both inside financial wealth and outside financial wealth. MMT has tried to open the discussion to the impact of fiscal austerity on the private sector's source of outside wealth. These are complementary, not exclusionary, efforts.

1.1.7 *Basics of Sectoral Accounting, Relations to Stock and Flow Concepts*

Let us continue with our division of the economy into three sectors: a domestic private sector (households and firms), a domestic government sector (including local, state or province, and national governments), and a foreign sector (the rest of the world, including households, firms, and governments). Each of these sectors can be treated as if it had an income flow and a spending flow over the accounting period, which we will take to be a year. There is no reason for any individual sector to balance its income and spending flows each year. If it spends less than its income, this is called a *budget surplus* for the year; if it spends more than its income, this is called a *budget deficit* for the year; a *balanced budget* indicates that income equaled spending over the year.

From the discussion above it will be clear that a budget surplus is the same thing as a saving flow and leads to net accumulation of financial assets (an increase in net financial wealth). By the same token, a budget deficit reduces net financial wealth. The sector that runs a deficit must either run down its financial assets that had been accumulated in previous years (when surpluses were run) or issue new IOUs to offset its deficits. In common parlance, we say that it “pays for” its deficit by exchanging (selling) its assets for spendable bank deposits (called “dissaving”), or it issues debt (“borrows”) to obtain spendable bank deposits. Once it runs out of

accumulated assets, it has no choice but to increase its indebtedness every year that it runs a deficit. On the other hand, a sector that runs a surplus will be accumulating net financial assets. This surplus will take the form of financial claims on at least one of the other sectors.

1.1.8 *Another Note on Real Assets*

A question arises: what if one uses saving (a budget surplus) to purchase real assets rather than to accumulate net financial assets? In that case, the financial assets are simply passed along to someone else. For example, if you spend less than your income, you can accumulate deposits in your checking account. If you decide you do not want to hold your savings in the form of a checking deposit, you can write a check to purchase, say, a painting, an antique car, a stamp collection, real estate, a machine, or even a business firm. You convert a financial asset into a real asset. However, the seller has made the opposite transaction and now holds the financial asset. The point is that if the private sector taken as a whole runs a budget surplus, someone will be accumulating net financial assets (claims on another sector), although activities within the private sector can shift those net financial assets from one “pocket” to another.

1.1.9 *Conclusion: One Sector’s Deficit Equals Another’s Surplus*

All of this brings us to the important accounting principle that if we sum the deficits run by one or more sectors, this must equal the surpluses run by the other sector(s). Following the pioneering work by Wynne Godley, we can state this principle in the form of a simple identity:

$$\begin{aligned} \text{Domestic Private Balance} + \text{Domestic Government Balance} \\ + \text{Foreign Balance} \equiv 0 \end{aligned}$$

For example, let us assume that the foreign sector (ROW) runs a *balanced budget* (in the identity above, the foreign balance equals zero). Let us further assume that the domestic private sector’s income is \$100 billion while its spending is equal to \$90 billion, for a budget surplus of \$10 billion over the year. Then, by identity, the domestic government sector’s budget deficit for the year is equal to \$10 billion. From the discussion above, we know that the domestic private sector will accumulate

\$10 billion of net financial wealth during the year, consisting of \$10 billion of domestic government sector liabilities.

As another example, assume that the foreign sector spends less than its income, with a budget surplus of \$20 billion. At the same time, the domestic government sector also spends less than its income, running a surplus of \$10 billion. From our accounting identity, we know that over the same period the domestic private sector must have run a budget deficit equal to \$30 billion (\$20 billion plus \$10 billion). At the same time, its net financial wealth will have fallen by \$30 billion as it sold assets and issued debt to finance its extra spending. Meanwhile, the domestic government sector will have increased its net financial wealth by \$10 billion (reducing its outstanding debt or increasing its claims on the other sectors), and the foreign sector will have increased its net financial position by \$20 billion (also reducing its outstanding debt or increasing its claims on the other sectors).

It is apparent that if one sector is going to run a budget surplus, at least one other sector *must* run a budget deficit.

In terms of stock variables, in order for one sector to accumulate net financial wealth, at least one other sector must increase its indebtedness by the same amount. It is impossible for all sectors to accumulate net financial wealth by running budget surpluses.

We can formulate another “dilemma”: if one of the three sectors is to run a surplus, at least one of the others must run a deficit.

No matter how hard we might try, we cannot all run surpluses simultaneously. It is a lot like those children in Lake Wobegon (an imaginary town featured in Garrison Keillor’s *Prairie Home Companion* weekly radio show in the United States) who are supposedly all above average. For every kid above average, there must be at least one below average. And for every deficit, there must be a surplus.

1.2 MMT, SECTORAL BALANCES, AND BEHAVIOR

In the previous section we introduced the basics of macro accounting. In this section we will go a bit deeper into the accounting, looking at the relation between flows (deficits) and stocks (debts). To avoid making mistakes we need to make sure that we have “consistency” between our flows and our stocks. We want to make sure that all spending and saving come from somewhere and go somewhere. And we must make sure that one sector’s surplus is offset by a deficit in another sector. This is a lot like keeping track of the scores in a baseball game, and in fact most financial “scores” really are electronic entries in the modern world (like those on an electronic scoreboard).

We will also try to say something about causation. For example, we would like to be able to understand why the US private sector balance was negative during the Clinton Goldilocks years (mid to late 1990s) while the government balance was positive—how did we get to that point, and what sorts of processes did it induce? Unlike the macro accounting identity (which must be true), it is not possible to say with certainty what causes a particular sector’s balance. Explaining why the US private sector had a deficit during the Goldilocks years is hard.

It is even more difficult to project if and for how long a budget deficit might continue. Economic projections are darned hard to get right—if they were easy, we would all make lots of money placing bets on outcomes.

Another way of stating this is to say that a good understanding of MMT and sectoral balances does not give one a monopoly on explanations of causation. We must not be overly confident. As the late and great Wynne Godley used to put it, he did not make forecasts; rather, he made contingent projections.

For example, carrying on the work of Wynne Godley, the Levy Economics Institute (www.levy.org) makes such projections. Typically it begins with US Congressional Budget Office (CBO) projections of the path of government deficits and of economic growth over the next few years. CBO projections are largely determined by current law (i.e., laws governing spending and taxing, as well as mandates over deficit reduction). However, the CBO’s projections are not always stock-flow consistent and do not adopt the three-sector balances approach. In other words, they are in that sense incoherent.

But given projections over the government balance and GDP growth as well as empirical estimates of various economic parameters (e.g., propensity to consume and import), one can produce a stock-flow-consistent model that produces the implied sectoral balances as well as path of debt. The Levy Institute often finds that economic growth rates (for example) plus government deficit projections used in CBO forecasts imply highly implausible balances in the other two sectors (domestic private and foreign) as well as excessively high private debt ratios. To do that kind of analysis you must go beyond the simple accounting identities, but you should ensure your analysis doesn’t violate the identities.

1.2.1 Deficits→Savings and Debts→Wealth

We have established in our previous section that the deficits of one sector must equal the surpluses of (at least) one of the other sectors. We have also established that the debts of one sector must equal the financial wealth of

(at least) one of the other sectors. So far this all follows from the principles of macro accounting. However, the economist wishes to say more than this, for, like all scientists, economists are interested in causation. Economics is a social science, that is, the science of extraordinarily complex social systems in which causation is never simple because economic phenomena are subject to interdependence, hysteresis, cumulative causation, and “free will” influenced by expectations. Still, we can say something about causal relationships among the flows and stocks that we discussed previously. Some readers will note that the causal connections adopted here follow from Keynesian theory. Let us lay out our beliefs.

- (a) *Individual spending is mostly determined by income.* Our starting point will be the private sector decision to spend. For the individual, it seems plausible to argue that income largely determines spending because one with no income is certainly going to be severely constrained when deciding to purchase goods and services. However, on reflection it is apparent that even at the individual level, the link between income and spending is loose: one can spend less than one’s income, accumulating net financial assets, or one can spend more than one’s income by issuing financial liabilities and thereby becoming indebted. In turn, ability to borrow is also related to income. At the level of the individual household or firm, the direction of causation largely runs from income to spending even if the correspondence between the two flows is not perfect. There is little reason to believe that one’s own spending significantly determines one’s own income, so we conclude that the causation largely goes *from* income *to* expenditure.
- (b) *Deficits create financial wealth.* We can also say something about the direction of causation regarding accumulation of financial wealth at the level of the individual. If a household or firm decides to spend more than its income (incurring a budget deficit), it can issue liabilities to finance purchases. These liabilities will be accumulated as financial wealth by another household, firm, or government that is saving. Of course, for this net financial wealth accumulation to take place we must have one household or firm willing to spend more than its income, and another household, firm, or government willing to accumulate wealth in the form of the liabilities of that spender running a deficit. We can say that “it takes two to tango”. However, it is the decision to spend more than income that is the initiating cause of the creation of net financial wealth. No matter how much others might want to accumulate financial wealth, they will not be able to do so unless someone is willing to spend in excess of income.

Still, it is true that the household or firm will not be able to do so unless it can sell accumulated assets or find someone willing to hold its liabilities. We can suppose there is a propensity (or desire) to accumulate net financial wealth by at least some individual households, firms, governments, or foreigners. This does not mean that every individual firm or household will be able to issue debt so that it runs a deficit, but it does ensure that many firms and households will find willing holders of their debt. And in the case of a sovereign government, there is a special power—the ability to tax—that virtually guarantees that households and firms will want to accumulate the government’s debt. (This is a topic we pursue later.)

We conclude that while causation is complex, and while “it takes two to tango”, causation tends to run from a budget deficit to accumulation of financial wealth and from debt to financial wealth. Since accumulation of a stock of financial wealth results from a budget surplus, that is, from a flow of saving, we can also conclude that causation tends to run from deficits to saving since the unit spending more than income provides the financial wealth to accumulate by units with surpluses.

- (c) *Aggregate spending creates aggregate income.* At the aggregate level, taking the economy as a whole, causation is more clear-cut. A society cannot decide to have more income, but it can decide to spend more. Further, all spending must be received by someone, somewhere, as income.

Finally, as discussed earlier, spending is not necessarily constrained by income because it is possible for households, firms, or government to spend more than income. Indeed, as we discussed, any of the three main sectors can run a deficit with at least one of the others running a surplus. However, it is not possible for spending at the aggregate level to be different from aggregate income since the sum of the sectoral balances must be zero. For all of these reasons, we must reverse causation between spending and income when we turn to the aggregate; while at the individual level, income causes spending, at the aggregate level, spending causes income.

- (d) *Deficits in one sector create the surpluses of another.* Earlier we showed that the deficits of one sector are by identity equal to the sum of the surplus balances of the other sector(s). If we divide the economy into three sectors (domestic private sector, domestic government sector, and foreign sector), then if one sector runs a deficit at least

one other must run a surplus. Just as in the case of our analysis of individual balances, it “takes two to tango” in the sense that one sector cannot run a deficit if no other sector will run a surplus. Equivalently, we can say that one sector cannot issue debt if no other sector is willing to accumulate the debt instruments.

Of course, much of the debt issued within a sector will be held by others in the same sector. For example, if we look at the finances of the private domestic sector, we will find that most business debt is held by domestic firms and households. In the terminology we introduced earlier, this is “inside debt” of those firms and households that run budget deficits held as “inside wealth” by those households and firms that run budget surpluses. However, if the domestic private sector taken as a whole spends more than its income, it must issue “outside debt” held as “outside wealth” by at least one of the other two sectors (domestic government sector and foreign sector). Because the initiating cause of a budget deficit is a desire to spend more than income, the causation mostly goes from deficits to surpluses and from debt to net financial wealth. While we recognize that no sector can run a deficit unless another wants to run a surplus, this is not usually a problem because there is a propensity to net save financial assets. That is to say, there is a desire to accumulate financial wealth—which by definition is somebody’s liability.

1.2.2 *Conclusion*

Before moving on it is necessary to emphasize that everything in this section applies to the macro accounting of any country. While examples used the Dollar, all of the results apply no matter what currency is used. Our fundamental macro balance equation,

$$\begin{aligned} \text{Domestic Private Balance} + \text{Domestic Government Balance} \\ + \text{Foreign Balance} \equiv 0 \end{aligned}$$

will strictly apply to the accounting of balances of any currency. Within a country there can also be flows (accumulating to stocks) in a foreign currency, and there will be a macro balance equation in that currency also.

Note that nothing changes if we expand our model to include a number of different countries, each issuing its own currency. There will be a macro balance equation for each of these countries and for each of the

currencies. Individual firms or households (or, for that matter, governments) can accumulate net financial assets denominated in several different currencies; vice versa, individual firms or households (or governments) can issue net debt denominated in several different currencies. It can even become more complicated, with an individual running a deficit in one currency and a surplus in another (issuing debt in one currency and accumulating wealth in another). Still, for every country and for every currency there will be a macro balance equation.

Frequently Asked Questions

Q: Is spending really determined by income? What about borrowing to spend?

A: Of course, it is true that wealthier people can fairly easily spend even if their flow of income is zero—they can sell assets or borrow against them. But for many households it is *mostly* true that income determines spending. And it is common sense to most people. The bigger theoretical point, however, is that at the aggregate level we need to think about reversing the causation. My household’s income is mostly determined by my employer’s decision to spend on my wages and salaries. So household consumption really depends to a great extent on its income (consumption is called “induced spending”—i.e., induced by an increase in income), but its income in turn comes from somewhere—largely spending by firms and governments on wages, profits, and interest. And that spending by firms is undertaken on the expectation of sales (expenditures by households, foreigners, governments, or other firms). We also have government, investment, and export spending that are at least to some extent “autonomous” from income (they don’t depend so much on today’s income). These are important issues both for explanation and for projections of economic performance. There is also a logical angle: a society can decide to spend more, but it cannot decide to have more income (unless it spends more). Spending is thus logically prior.

(continued)

(continued)

Q: Isn't it savers who force deficit spending and not the other way? If households won't spend, GDP declines, lowering tax revenue and thus causing a budget deficit.

A: Good point. It takes two to tango, of course. You need a non-government sector to net save in order for the government sector to end up with a deficit. Otherwise, government spending would ramp up nongovernment spending until taxes increased sufficiently to balance the government's budget.

Q: Why is an "imbalance" (i.e., a sectoral surplus or deficit) called a "sectoral balance"? Why would we call an "imbalance" a "balance": that is, if the private sector runs a deficit, why would we refer to that as the private sector's "balance"?

A: Well, you have a checking account "balance" at your bank that is probably positive. If you write a check for more than your "balance", and if you have automatic overdraft coverage, then you will now have a negative "balance" in your account! So you would still call that a "checking account balance" even though it is "imbalanced". The "balance" can be either positive, zero, or negative for any sector.

1.3 STOCKS, FLOWS, AND BALANCE SHEET: A BATHTUB ANALOGY

Each item in the balance sheet of a firm, household, or government records the outstanding amount of an asset or a liability. The outstanding amount is a stock, that is, the measure of value at a point in time. Stocks are affected by flows because inflows accumulate to a stock, while outflows reduce a stock.

Maybe a better way to look at it is in terms of a bathtub. Below is a bathtub half full of water. The water in the tub is called the stock of water. Currently, there is no water flowing in the tub from the faucet, and there is a stopper on the drain so no water is flowing out of the tub. Thus the stock of water remains the same. This initial level of water will be used as a point of reference below (Fig. 1.1).

Fig. 1.1 Initial amount of water

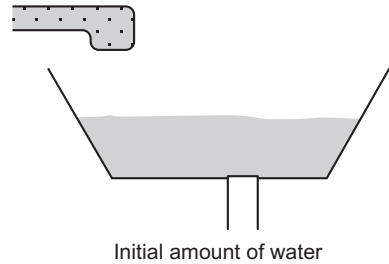
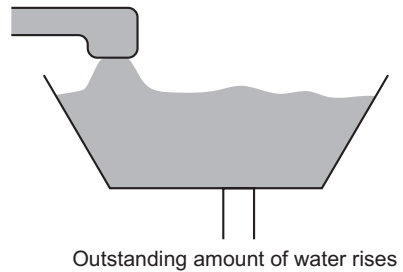


Fig. 1.2 Outstanding amount of water rises



The stable level of water in the bathtub would be similar to having money in a checking account (a stock of deposits) and neither receiving any deposits (no inflow) nor spending any deposits (no outflow). It also would be similar to having an outstanding amount of debts and not taking on more debt or repaying any debts.

What would happen if suddenly we turn on the faucet? Water would flow into the tub and the stock of water would rise (Fig. 1.2).

This is like receiving a monetary income and saving all of it, so the amount of deposits in a checking account would rise. This would also be similar to buying a new car and keeping the old one: the stock of cars owned would rise. Of course, if we now turn off the faucet and remove the stopper on the drain, the water in the tub would flow out of the tub and the stock of water would decline until nothing is left in the tub. The equivalent of this in terms of a checking account would be that someone does not receive income but still spends. This is called dissaving and would lead to a decline in the outstanding funds in the checking account until all the deposits were gone. Similarly, if someone repays her debts and does not borrow more, her outstanding amount of debts declines.

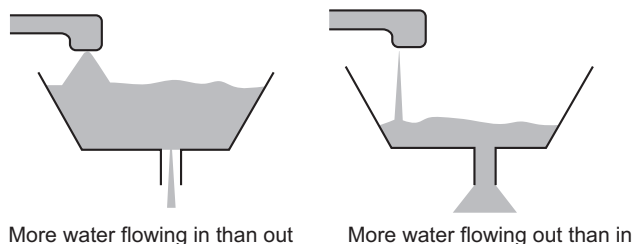


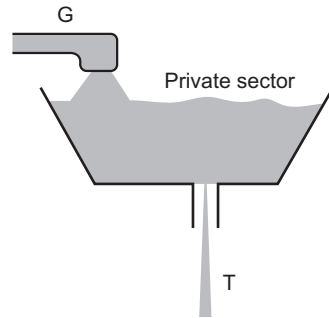
Fig. 1.3 (a) More water flowing in than out. (b) More water flowing out than in

Finally, if both the faucet and drain are open, the outstanding amount of water will rise if the inflow of water from the faucet is greater than the outflow of water through the drain. In terms of a checking account that would mean that the income inflow is greater than the outflow due to spending, so the individual is saving. The income saved adds to the outstanding stock of funds in the checking account. If the individual spends more than income, dissaving depletes the checking account. In terms of the tub, if more water flows out the drain than flows from the faucet, the tub empties (Fig. 1.3).

One of the central goals of national accounting (Flow of Funds Accounts and National Income and Product Accounts) is to account for all the flows and all the stocks for all assets and liabilities of the private sector, the government, and the rest of the world. The common measure used to measure stocks and flows is the monetary unit of account (Dollar, Euro, etc.). It is not always easy to measure everything in monetary terms because the monetary value of some stocks and flows is hard to know. One reason is that some things are not purchased directly or at all. (What is the monetary value of public lighting? What about a public park? What is the value of the vegetables grown in your garden?) Another reason is that some inflows and outflows escape measurements (there are leakages in the water pipes and water evaporates from the tub) because there is no recording for them. Some people lose cash; someone's old car may get stolen and a claim is not reported. More broadly, there are a lot of underground economic activities that are not recorded anywhere. Thus in practice some statistical discrepancies will emerge in accounting due to difficulty of measurement or unavailability of data.

Another goal of national accounting is to see how economic sectors relate to each other. For example, when the government spends on goods

Fig. 1.4 Government deficit and private sector



Government deficit and private sector

and services (G), this leads to an inflow of income to the private sector. On the other hand, taxes (T) are a drain on the private sector. In the graph above, G is greater than T (meaning government spending is greater than tax revenue), so the bathtub savings of the private sector rise (Fig. 1.4).

In this case the government is running a deficit and the private sector is saving, so the water in the tub increases. This gives us an accounting identity:

$$S \equiv (G - T)$$

The flow of the private sector saving (S) is equal by definition to the size of the fiscal deficit ($G - T$). They can never be different from one another (hence the three bars equals sign, which stands for “true by identity”).

Technically this is true for a two-sector economy, with a government sector and a household sector. Once we add business firms to the household sector, that is like adding another faucet, for investment spending by firms. That augments our identity to $S \equiv (G - T) + I$, where I stands for private domestic investment. This says that private sector saving equals the budget deficit plus investment spending.

If we added a foreign sector, we would need another faucet (exports) and drain (imports), and then our full identity would be: $S \equiv (G - T) + I + NX$ (where NX is net exports, meaning exports minus imports). Saving thus equals the budget deficit plus investment, plus net exports.

1.4 GOVERNMENT BUDGET DEFICITS ARE LARGELY NONDISCRETIONARY: THE CASES OF THE GREAT RECESSION OF 2007 AND THE COVID-19 PANDEMIC

In previous sections we have examined the three balances identity and established that the sum of deficits and surpluses across the three sectors (domestic private, government, and foreign) must be zero. We have also said something about causation because it is not enough to simply lay out identities. We have argued that while household income largely determines spending at the individual level, at the level of the economy as a whole it is best to reverse that causation: spending determines income.

Individual households can certainly decide to spend less in order to save more. But if all households were to try to spend less, this would reduce aggregate consumption and national income. Firms would reduce output, laying off workers, cutting the wage bill, and thereby lowering household income. This is J.M. Keynes' well-known "paradox of thrift"—trying to save more by cutting aggregate consumption will not increase saving but reduce income instead. We'll have more to say about that in a box below.

Surprisingly, it is also the case that government can choose to spend more, but cannot easily decide to increase its income—that is, tax revenue. While government can raise *tax rates*, tax *revenue* depends largely on economic performance—as revenue depends on variables outside government's control, such as household and business income, purchases, capital gains, and taxable imports. It turns out that government spending tends to be countercyclical (rising as the economy slows) while tax revenue is highly pro-cyclical (falls when the economy slows). Combining those tendencies means that budget deficits increase sharply in an economic downturn and deficits fall in economic booms.

Let's examine two cases to demonstrate this: the Global Financial Crisis (GFC) of the late 2000s and the Global COVID-19 Pandemic of the early 2020s. In both cases budget deficits grew rapidly—although for slightly different reasons.

As the economy crashed into the GFC, social spending by government (e.g., on unemployment compensation) rose while tax revenues collapsed. The deficit grew rapidly leading to widespread fears of eventual insolvency or bankruptcy and attempts to cut spending (and perhaps to increase taxes) to reduce deficits. The national conversation (in the United States, the United Kingdom, and Europe, for instance) presumed that

government budget deficits are discretionary. If only the government were to try hard enough, it could slash its deficit.

However, anyone who proposes to cut government deficits must be prepared to project impacts on the other balances (private and foreign) because by identity the budget deficit cannot be reduced unless the private sector surplus or the foreign surplus (flip side to the domestic current account deficit) is reduced.

After the Great Recession of 2008, many government budgets moved sharply to large deficits. (See the figure below for the US case.) While observers attributed this to various fiscal stimulus packages (including bailouts of the auto industry and Wall Street in the United States, and bank bailouts in Ireland, for example), the largest portion of the increase in the deficit in most countries came from automatic stabilizers and not from discretionary spending.

This is easily observable in the graph below for the situation in the United States during the period surrounding the Global Financial Crisis which shows the rate of growth of tax revenues (mostly automatic), government consumption expenditures (somewhat discretionary), and transfer payments (again mostly automatic) relative to the same quarter of the previous year (Fig. 1.5):

In 2005 tax revenues were humming, with a growth rate hitting 15 percent per year—far above GDP growth—hence reducing nongovernment sector after-tax income—and faster than government spending, which grew just above 5 percent. Such fiscal tightening (called fiscal drag) often is followed by a downturn, and the downturn that accompanied the GFC was no exception. When it came, the budget deficits increased, mostly automatically. While government consumption expenditures remained relatively stable over the downturn (after a short spike in 2007–2008), the rate of growth of tax revenues dropped sharply from a 5 percent growth rate to a 10 percent *negative* growth rate (from Q4 of 2007 to Q2 of 2008), reaching another low of negative 15 percent in Q1 of 2009. Tax receipts quite simply fell off a cliff as the economy slumped deeply.

Transfer payments grew at a rate above 10 percent after 2007 largely due to the rotten economy. Decreasing taxes coupled with increased transfer payments automatically pushed the budget into a larger deficit, notwithstanding the flat consumption expenditures. The automatic stabilizer—and not the bailouts or stimulus—is the main reason why the economy did not go into a freefall as it had in the Great Depression of the

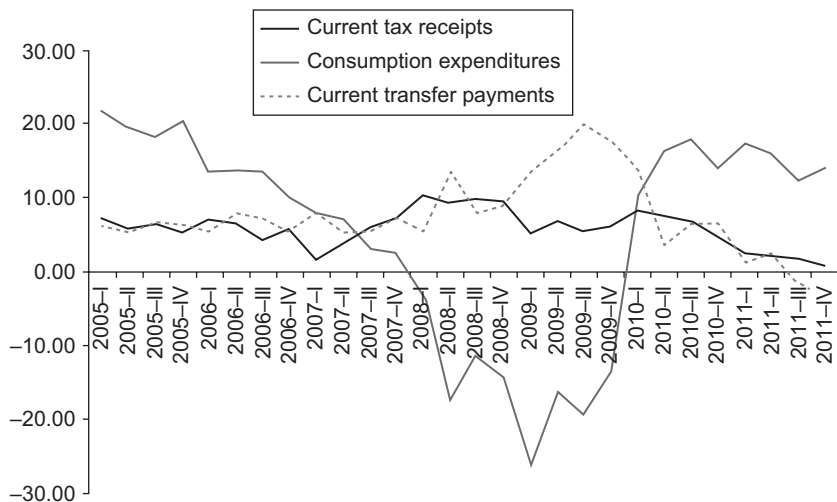


Fig. 1.5 Federal government tax receipts, consumption expenditures, and transfer payments (growth rate relative to the same quarter of the previous year). (Source: Bureau of Economic Analysis and author's calculations)

1930s. As the economy slowed, the budget automatically went into a deficit, putting a floor on aggregate demand.

With countercyclical spending and pro-cyclical taxes, the government's budget acted as a powerful automatic stabilizer: deficits increase sharply in a downturn.

After the global crash, the US household sector retrenched (as it always does in a recession), with saving rising sharply. Slow growth has been the major cause of the rapidly growing budget deficit, and the slow growth, in turn, was due to a high propensity to save by the retrenching household sector. See the next graph that shows a spike in savings after 2007, reversing a long trend of falling household savings rates (Fig. 1.6):

What we see is a rather remarkable reduction of household saving on trend since the mid-1980s—falling from about 10 percent of disposable personal income to nearly zero by 2005. The cause is beyond the scope of this section, but the flip side to that was the rise of household debt. That trend turned around sharply after the GFC, with households saving like it was 1992 all over again. Given the loss of jobs, and stagnant incomes (at best) for most Americans, uncertainty drove up the propensity to save.



Fig. 1.6 Propensity to save out of disposable income. (Source: BEA)

(Note that saving as a percent of disposable income is not exactly the same as the household balance that goes into our three-sector balance equation. That is why although this is a small positive saving number, in the sectoral balances equation households actually spent more than their income. See the technical note at the end of the chapter for the wonky stuff.)

When the global COVID-19 pandemic hit, large parts of the economy were shut down and many workers lost their wages. Spending collapsed and unemployment soared at an unprecedented pace. With falling spending and income, tax revenue also plunged. Then President Trump and President Biden ramped up relief spending without worrying about impacts on the federal government's deficit—that rapidly grew to 25 percent of GDP. While some called this *stimulus* spending, households used their relief checks largely to pay down overdue bills and to increase saving. The uncertainty surrounding the health pandemic encouraged precaution, not spending. Furthermore, with businesses shut down and global supply chains in disarray, more spending was not what the economy needed. Figure 1.7 shows the rise of the government's deficit along with the increase of the nongovernment sector's surplus (or, savings).

Finally, Fig. 1.8 shows the sectoral balances over the period from 1960 through 2022. In this one, we break out the rest of the world from the domestic nongovernment sectors (US households and firms). In both of the crises (the GFC and the COVID-19 pandemic) the domestic private