Chapter 5: Sectoral Accounting and the Flow of Funds

Learning Objectives

1. Understand the relationship between sectoral balances and changes to net financial assets.

2. Recognise the distinction between vertical and horizontal transactions in their impact on net financial assets.

3. Interpret a balance sheet (stocks) and period to period changes of its items (flows).

5.1 Introduction

In Chapter 4, we saw that the national accounts divided the national economy into different expenditure categories – consumption by persons/households (note housing is investment); investment by private business firms; spending by the government; exports to and imports from the foreign sector.

The most basic macroeconomics rule is that one person's spending is another person's income. Another way of stating this rule is that the use of income by one person (i.e. spending) will become the source of income for another person or persons.

In this Chapter, we extend our understanding of the national accounts, which record these different flows of expenditure and income. The **sectoral balances perspective** of the national accounts brings the uses and sources of national income together. We show that when appropriately defined, the sectoral balances must sum to zero. We expand our discussion of stocks and flows and then introduce the flow of funds by reference to the sectoral balances.

The sectoral balances approach helps us to understand the relations among the spending and income balances of the households, firms, government, and foreign sectors of the economy. For example, they allow us to conclude that it is impossible for all sectors to run surpluses (that is, to 'save overall' – spend less than their income) simultaneously. For one sector to run a surplus, we need at least another to run a deficit (spend more than their income). You will learn that for those nations, which run external deficits against the rest of the world, then, in order for households and firms together (that is, the private domestic sector) to run surpluses (spending less than income in order to save overall) it is necessary for the government to run fiscal deficits (spend more than taxes). There are many useful insights that can be gained from an understanding of a nation's sectoral balances.

5.2 The Sectoral Balances View of the National Accounts

The Australian Bureau of Statistics publication – *Australian System of National Accounts: Concepts, Sources and Methods, 2014* – provides an excellent source for understanding the background concepts that are used to derive the sectoral balances framework. The discussion is generally applicable to all countries.

From this framework, economists derived what is called the basic **income-expenditure model** in macroeconomics to explain the theory of income determination that forms the core of the so-called **Keynesian** approach (see Chapter 7).

The income-expenditure model is a combination of accounting identities drawn from the national accounting framework and behavioural theories about how flows of expenditure by households, firms, governments, and foreigners combine to generate sales, which in turn, motivate output and income generation.

Remember, that an expenditure **flow** is measured as a certain quantity of dollars that is spent per unit of time. So for example, in the June-quarter 2015, the Australian Bureau of Statistics estimated that household consumption in Australia was $A220,913 million in real, seasonally-adjusted terms.

Conversely, a **stock** is measured at a point in time and is the product of prior, relevant flows. For example, the Australian Bureau of Statistics estimated that total employment in Australia in

October 2015 was 11,838.2 thousand. The flows that generated this stock of employment were all the movements of workers between the different labour force categories: employment, unemployment, and not in the labour force. Of course, most workers remained in the same labour force category as they were in September 2015.

The accounting aspects that underpin the income-expenditure model draw on different ways of thinking about the national accounts.

We can view the national accounts in several ways. First, from the perspective of the **sources** of national income, we can write out the sources of spending that flow into the economy over a given period, using the following shorthand.

(5.1) $$GDP \equiv C + I + G + (X - M)$$

that is, total national income (GDP) is the sum of total final consumption expenditure (C), total private investment (I), total government expenditure (G) and net exports ($X - M$). Note the use of the mathematical symbol $\equiv$, which denotes an **Identity** that is true by definition.

At this stage we simply take these flows of expenditure as given and understand them to be parts of the national accounts of a nation.

When these components of spending are summed, they equal **aggregate demand for goods and services** in a particular period. Aggregate demand, in turn, generates a response by producers (private and public) in the form of production, which, in turn, generates flows of income to suppliers of inputs into production (wages, profits). The sum of those flows equals national income.

As we noted in Chapter 4, the trade account is only one aspect of the financial flows between the domestic economy and the external sector. We must include net external income flows (FNI), which arise from the dividend and income flows that accrue to investments that residents make abroad minus the dividend and interest flows that are paid to foreign investors who have interests within the nation.

Adding in the net external income flows (FNI) to Equation (5.1) for GDP we get the familiar definition of gross national product or gross national income measure (GNP):

(5.2) $$GNP \equiv C + I + G + (X - M) + FNI$$

At this stage, we could make the analysis quite complicated by considering retained earnings in corporations and the like, but here we assume that all income generated by firms and corporations ultimately is received by households.

To obtain the sectoral balances form of the identity, we subtract total taxes net of transfers (T) from both sides of Equation (5.2), using the rules that govern the manipulation of equations, as outlined in the *Methods, Tools and Techniques Appendix*.

We thus obtain:

(5.3) $$GNP - T \equiv C + I + G + (X - M) + FNI - T$$

Now we can collect the terms by arranging them according to the three sectoral balances:

(5.4) $$(GNP - C - T) - I \equiv (G - T) + (X - M + FNI)$$

The terms in Equation (5.4) are relatively easy to understand now. The term *(GNP – C – T)* represents total income less the amount consumed by households less the amount paid by households to government in taxes net of transfers. Thus, it represents household saving.

The left-hand side of Equation (5.4), *(GNP – C – T) – I,* thus is the **overall saving** of the **private domestic sector**, which is distinct from total household saving denoted by the term *(GNP – C – T).*

In other words, the left-hand side of Equation (5.4) is the **private domestic financial balance**. If it is positive then the sector is spending less than its total income (so the sector is adding to its stock of net financial assets) and if it is negative the sector is spending more than its total income.

The term *(G – T)* is the **government financial balance** or primary fiscal balance and is in deficit if government spending *(G)* is greater than government tax revenue *(T)*, and in surplus if the balance is negative.

Finally, the other right-hand side term *(X – M + FNI)* is the **external financial balance**, commonly known as the Current Account Balance (CAB). It is in surplus if positive and deficit if negative. It is the balance between the spending/income flows of foreigners in the nation and the spending/income flows by residents that go to foreign nations.

We can say that:

The private domestic financial balance equals the sum of the government financial balance plus the current account balance.

This is an accounting statement.

Note that by re-arranging Equation (5.4) we get another version of the sectoral balances equation:

(5.5) $\qquad (S – I) + (T – G) - CAB \equiv 0$

which shows that, when suitably defined, the balances sum to zero.

For example, let us assume that the external or foreign balance equals zero. Let us further assume that the private domestic sector's income is $100 billion while its spending is equal to $90 billion, which delivers an overall surplus of $10 billion over the year. Then, from the identity, Equation (5.5), the government sector's fiscal deficit for the year is equal to $10 billion. We know that the private domestic sector will accumulate $10 billion of net financial wealth during the year, consisting of $10 billion of domestic government sector liabilities (given that the external balance is zero).

As another example, assume that the foreign sector spends less in the nation in question relative to the income it receives from that nation, which generates a current account deficit of $20 billion. At the same time, the government sector also spends less than its income, running a fiscal surplus of $10 billion. From our accounting identity, we know that over the same period the private domestic sector must have run an overall 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/or issued debt. Meanwhile, the 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 reduced its net financial position by $20 billion (also raising its outstanding debt or reducing its claims on the other sectors).

It is apparent that if one sector is going to run a surplus, at least one other sector must run a deficit. In terms of stock variables, in order for one sector to accumulate net financial wealth, at least one other sector must be in deficit. **It is impossible for all sectors to accumulate net financial wealth by running surpluses.**

How can we use the sectoral balances framework?

Figure 5.1   UK sectoral balances, 1960 to 2014
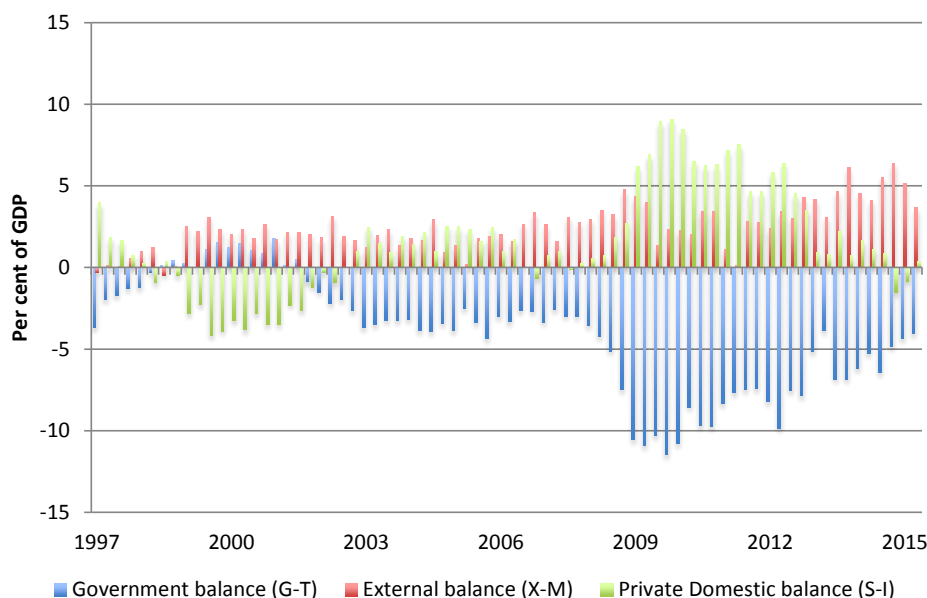
Source: OECD (2015) (see also Watts and Sharpe, 2016). Note: Imports (M) include net income flows in this graph.

The UK sectoral balances shown above (Figure 5.1) replicate Equation (5.5), except that the balances which sum to zero, are expressed as percentage shares of GDP.

At this stage 3 observations are appropriate:

1. Despite the contemporary rhetoric, the UK has rarely run an annual fiscal surplus. Indeed seven surpluses have been achieved since 1960.

2. Like a number of other developed economies, including the USA and Australia, current account surpluses have also been relatively rare.

3. Private sector balances have typically been in surplus. The limited occurrence of private sector deficits have been often accompanied by fiscal surpluses. The three annual fiscal surpluses between 1998 and 2000 were accompanied by current account deficits and relatively large private sector deficits (7.3 percent of GDP in 2000). The 2001 economic slowdown followed (Watts and Sharpe, 2016). Wray (1999) notes that fiscal surpluses usually have been followed by recessions in the USA. A similar pattern is evident in most advanced economies.

In Chapter 7 we will develop an understanding of how expenditure drives income generation via the principle of aggregate (effective) demand. The principle tells us that total income in the

economy per period will be exactly equal to total spending from all sources but also details the behavioural processes involved that bring that equality into line.

We will outline theories of the components of expenditure. For example, there are various theories of household consumption expenditure but all of them suggest that consumption is determined positively by changes in disposable income. The response of consumption to a change in income is called the Marginal Propensity to Consume (MPC). It is normally hypothesised that the MPC will be less than one, so that the residual of disposable income not consumed will be positive. That constitutes saving.

So the private domestic sector financial balance *(S – I)* will increase, other things equal, when national income rises.

Similarly, taxation revenue (net of transfers) is considered to be a positive function of national income. So, other things equal, the government financial balance *(G – T)* falls when national income rises, and vice versa. Similarly, government spending automatically increases when national income falls as a result of welfare payments rising. In this way, the government fiscal deficit (surplus) is said to operate as an automatic stabiliser, with net expenditure being higher when national income is lower and vice versa.

Imports are also considered to be a positive function of national income – so when national income increases, we simultaneously buy more locally-produced goods and more imported goods. So the external balance falls when national income rises, and vice versa, other things equal.

In turn, changes in financial balances by sector are driven by joint impact of changes in expenditure and national income flows, as outlined above.

The accounting structures that underpin the sectoral balances framework also allow us to check logic. For example, if a politician says that the government and non-government sectors should simultaneously reduce their net indebtedness (increase their net wealth) (assuming neo-liberal public debt issuance strategies) then we know that is not possible. We don't have to resort to theory to make those sorts of conclusions.

But the accounting structures do not allow us to determine the validity of a political statement that austerity measures will stimulate growth. At that point we need theory but we should still use the sectoral balances framework to draw inferences about the overall macroeconomic outcome when sectoral balances respond to the imposition of austerity.

5.3 Revisiting Stocks and Flows

Flows

In this section we re-examine the concepts of stock and flow variables, which were briefly outlined in Chapter 1, and delineate their differences, as well as the relationship between the two. This will enable us to clearly set out the necessary relationships between deficit spending and saving, and between financial deficits and debts. This Chapter will clarify these fundamental accounting relationships.

Flow variables are measured over time. The simplest example is personal income, which can be stated as $10 per hour, or $400 per week, or $20,000 per year. The important point is that without a clear statement of the time component, any statement about a flow is incomplete and

somewhat meaningless: if one says one's income is $100, we need to know whether that is per hour, per day, per week, or per year to make sense of it. It is also useful to work with growth of flow variables, often calculated as annual growth rates. For example, your employer might offer a labour contract that provides for annual cost of living increases equal to 4% per year. In the first year you would receive $20,000, while in the second you would receive a wage income of $20,800 ($20,000 plus 4% of $20,000, which is equal to $800).

What flows? When we speak of the flow of a river, it is obvious that it is water, which is flowing, measured in terms of thousands of cubic metres per second. However, it is not so clear what is flowing when we refer to flows of income and expenditure. For example, what flows to provide a wage income equal to $20,000 per year? The simple answer is 'dollars'. You work for your employer 8 hours a day, 5 days a week, and after two weeks you receive a cheque drawn on a bank or an electronic transfer for the sum of $800 (ignoring possible deductions for taxes and benefits). Even on payday, it is difficult to conceive of the pay cheque as the 'dollars' that were flowing while you were working. Actually, as we will see in Chapter 6, the cheque is really just an IOU issued by your employer's bank that is denominated in your nation's money of account - the dollar in our example.

In fact, we can conceive of your work for hourly wages as an implicit accumulation of the IOUs of your employer. Over the course of the two weeks during which you worked, you earned a flow of wages equal to $10 for each hour worked, received in the form of an implicit promise from your employer to pay you in dollars at the end of the two week period. Indeed, in the event of a dispute, the court system would recognize the legal obligation of your employer to pay dollars to you for hours worked. In this sense, we can conceive of each hour worked leading to your accumulation of IOUs of your employer denominated in dollars. On payday, your employer extinguishes their IOUs by delivering to you a cheque or a transfer for the total obligations accumulated over the two-week period. Two important conclusions follow from this example.

Flows are measured in terms of money. The money of account is the means by which we measure flows of income or spending. The associated flow of currency can take a physical form of notes and coins, but equally can be an electronic entry, say in a private bank account. Thus, in contrast to a flow of water, the flows of spending or income do not always take a physical form.

As we will explore later, metal coins and paper currency are really nothing more than government IOUs denominated in the money of account. While government currency is in some respects different from the cheques issued by banks and from the implicit IOUs you accumulate against your employer, all share a common characteristic because all are IOUs denominated in dollars.

We also need to differentiate between flows of income and spending denominated in the money of account from the associated flows of (labour) services and goods and services. In principle, consumer goods and services are used up to satisfy the needs and desires of households, however, consumption purchases made this week could include goods that will be used for many months or even years. Economists typically record consumption at the time the purchase is made and at the dollar value of the purchase even while recognising that goods and services purchased might provide a stream of 'satisfaction' over a long period of time.

Stocks

Flows accumulate as stocks. The flow of water in a stream can be accumulated in a reservoir behind a dam, or in the cup we dip into the stream. The stock of water is then the number of cubic metres in the reservoir, or the half litre in the cup. Unlike a flow, a stock can be measured without reference to a time period as it exists at a point of time. We can measure the stock of water in a lake at noon on the last day of the summer as 1.5 billion cubic metres, and at noon on the last day of the following winter as 2.0 billion cubic metres. Because the stock has increased, we can surmise that the inflow of water during the passing of six months has been greater than the outflow of water over that period, by an amount equal to 0.5 billion cubic metres.

Let us continue to assume that you receive a biweekly pay cheque equal to $800, twenty-five times a year for a total annual income of $20,000. On payday, you deposit your employer's cheque in your bank account, increasing your deposit by $800. Your bank deposit represents a portion of your wealth, held in the form of a financial asset, which is a claim on your bank. Because wealth is measured at a point in time, it is a stock variable. In addition to your bank account, you might also hold other forms of financial wealth (stocks and bonds, currency in your pocket, other types of bank deposits) as well as real wealth (a car, real estate, a business firm, art and jewels). Again, all of these are stock variables whose value is measured in terms of the money of account at a point in time.

Once you have deposited your $800 pay cheque, you begin to draw down your bank account to finance your purchases. Let us continue to assume that your annual consumption will be $18,000 for the year, comprised of purchases of consumer goods (food, fuel for your automobile, clothing) and consumer services (entertainment, medical care, legal services). Hence, between pay cheques, you spend a total of $720 for consumption, drawing down your bank account by that amount to finance these purchases.

Over the year, your flow of wage income has been equal to $20,000 and you have spent $18,000 of that on consumption. Then you have accumulated a stock equal to $2000 - which is equal to the inflow of income less the outflow of spending. Recalling our definition from above, your flow of saving over the year is also equal to $2000, because saving is defined as the residual dollar value of income that has not been spent over the period.

This will accumulate as an addition to your stock of wealth. If you allow the funds to accumulate in your cheque account - which we will initially assume does not earn interest - the annual addition to your financial wealth will be $2000. Alternatively, you could instead purchase interest-earning bonds, another form of financial wealth. In this case, however, you will also have a flow of interest earnings, in addition to your labour income. The flow of interest income - let us say it amounts to $200 over the course of the year - will also add to your stock of financial wealth (so that the total addition to your stock of financial wealth is $2200).

However, there are many other possible uses of your saving flow. You might decide to buy stocks or other kinds of financial assets. Or, you might purchase real assets - a collectable car, real estate, or equipment for your family's business firm. The saving decision can be analysed as a two-step process: first as a decision to withhold a portion of one's income flow from spending, and second a decision as to the form in which wealth will be accumulated. An income flow is first realised as an accumulation of IOUs - normally, claims on a bank in the form of a deposit - that in the second step is used to purchase an asset.

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 cheque deposit (also called a demand deposit or a sight deposit) is a household's financial asset, offset by the bank's liability (or IOU). A government or corporate bond is a household asset, but represents a liability of the issuer (either 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 including 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.

Examples of stocks include: stock of capital; inventories; financial wealth; and net worth.

Inside wealth versus outside wealth

It is often useful to distinguish among types of sectors in the economy. The most basic distinction is between the public sector (including all levels of government) and the domestic private sector (including households and firms). Note here we are simplifying by excluding the foreign sector as if the economy was completely closed to trade and capital flows.

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 financial wealth would have to be zero if we consider only private sector IOUs. This is sometimes called 'inside wealth' because it is 'inside' the private sector. In order for the private sector as a whole 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 domestic 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, which is a portion of its positive net wealth.

Net private financial wealth equals public debt. Recall from our discussion above that accumulation of stocks requires flows. The private sector accumulation of net financial assets over the course of a year is made possible only because its spending is less than its income over that same period. In other words, it has been saving, enabling it to accumulate a stock of wealth in the form of financial assets. In our simple example with only a public sector and a domestic private sector, these net financial assets are government liabilities—government currency and government bonds. These government IOUs, in turn, can be accumulated only when the government spends more than it receives in the form of tax revenue. This is called 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 in Chapter 13. 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 spending always equals its tax revenue, the private sector's net financial wealth would be zero.

Rest of world debts are domestic financial assets. We can broaden our analysis by considering the financial assets and liabilities of the rest of the world. So we now form three sectors in this open economy: a domestic private sector, a domestic public sector, and a 'rest of the world' sector that consists of foreign governments, firms, and households. In this case, it is possible for the domestic private sector to accumulate net financial claims on the rest of the world, even if the domestic public sector runs a balanced budget, with its spending over the period exactly equal to its tax revenue. The domestic sector's accumulation of net financial assets is equal to the rest of the world's issue of net financial liabilities. Finally, and more realistically, the domestic private sector can accumulate net financial wealth consisting of both domestic government liabilities as well as rest of world liabilities. It is also possible for the domestic private sector to accumulate government debt (adding to its net financial wealth) while also issuing debt to the rest of the world (reducing its net financial wealth). In the next section we turn to a detailed discussion of sectoral balances.

Non-financial wealth (real assets)

One's financial asset is necessarily offset by another's financial liability. However, real assets represent one's wealth that is not offset by another's liability, hence, at the aggregate level net wealth equals the value of real (non-financial) assets. To be clear, you might have purchased an automobile by going into debt. Your financial liability (your car loan) is offset by the financial asset held by the auto loan company. 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 at the aggregate level. Once we subtract all financial liabilities from total assets (real and financial) we are left with non-financial (real) assets, or aggregate net worth.

5.4   Integrating NIPA, Stocks, Flows and the Flow of Funds Accounts

The sectoral balances framework, which is derived from the national accounts framework, was explored in Section 5.2. It is intrinsically linked to the flow of funds analysis. They are different, but related, ways of considering national economic activity.

An early exponent of the flow-of-funds approach, Lawrence Ritter (1963:220) wrote that:

> The flow of funds is a system of social accounting in which (a) the economy is divided into a number of sectors and (b) a 'sources- and-uses-of-funds statement' is constructed for each sector. When all these sector sources-and-uses-of-funds statements are placed side by side, we obtain (c) the flow-of-funds matrix for the economy as a whole.

Thus, the flow-of-funds accounts allow us to link a sector's balance sheet (statements about stocks of financial and real net wealth) to income statements (statements about flows) in a consistent fashion. In a monetary economy, flows of expenditures measured in terms of dollars spent over a period involve transactions between sectors in the economy, which also have logical stock counterparts, that is flows feed stocks. The flow-of-funds accounts ensure that all of these transactions are correctly accounted for.

This approach underpinned the work of the so-called New Cambridge approach that was part of the Cambridge Economic Policy Group at the University of Cambridge in the early 1970s. Key members of this group were Martin Fetherston, Wynne Godley and Francis Cripps, all of who were of a Keynesian persuasion.

While the sectoral balances approach had been understood much earlier (for example, by Nicholas Kaldor and others), it was popularised by the New Cambridge macroeconomic analysis which introduced the concept of the **Net Acquisition of Financial Assets (NAFA)** into the forefront of its Keynesian income-expenditure model (see below).

Like Lawrence Ritter, the Cambridge economists were interested in tracing the flow of funds between the different sectors of the economy, which they divided into the government sector; the private domestic sector and the external sector, as outlined above. These transactions have occurred in a given period, and these sectors could record a financial deficit or surplus.

We can re-write Equation (5.5) as follows:

(5.5)   *(S – I) = NAFA = (G – T) + CAB*

(S – I) is the private domestic financial balance or NAFA of the private domestic sector. The private domestic sector is in financial surplus (deficit) when its disposable income *(GNP - T)* exceeds (is less than) its spending on consumption goods and investment goods.

From a stock perspective, NAFA can also be measured by the difference between the private domestic sector's stock of net financial assets at time *t* and the stock at time *t-1*, where *t* could be 2016, so that *t-1* would be 2015.

Noting the stock/flow distinction, Equation (5.5) can be interpreted as meaning that if its right hand side is positive, government sector deficits (G – T > 0) and current account surpluses *(CAB > 0)* generate national income and additional net financial assets for the private domestic sector. Then *NAFA>0*, which means that the private sector is running a surplus, and acquiring new assets and/or reducing its existing debt obligations, whereas the government financial balance is negative.

Conversely, fiscal surpluses *(G – T < 0)* and current account deficits *(CAB < 0)* reduce national income and undermine the capacity of the private domestic sector to net save and add to its stock of net financial assets. In this case *NAFA<0*, so that the private domestic sector is running down its net financial position by borrowing from the other sectors and/or by liquidating some of its stock of accumulated wealth.

If *G – T < 0*, then the government sector is spending less than it is taking out of the economy in taxation and undermining the capacity of the other two sectors to accumulate net financial assets by running surpluses and vice versa.

CAB is the external sector financial balance (the Current Account Balance) and comprises the **trade balance** (that is, the difference between export and import revenue on goods and services) and the **net income flows** that accrue to residents as a consequence of interest and dividends received on overseas ownership (offset by similar payments to foreigners).

If the overall external sector balance is in deficit then the national economy is borrowing from abroad or running down its net financial position in other ways and foreigners are accumulating financial asset claims and vice versa.

Equation (5.5) can also be written as:

(5.6) $\qquad [(S – I) – CAB] = (G – T)$

where the term on the left-hand side *[(S – I) – CAB]* is the non-government sector financial balance and is of equal and opposite sign to the government financial balance, *T - G*.

This is the familiar Modern Monetary Theory (MMT) conclusion that a government sector deficit (surplus) is equal dollar-for-dollar to the non-government sector surplus (deficit).

MMT adopts the same interpretation of these balances as the New Cambridge approach, but when applied to the government sector, any conclusion is somewhat meaningless other than in a purely accounting sense.

Importantly, transactions within the private domestic sector do not alter the net financial position of the sector overall. For example, if a bank creates a loan for one of its customers then its assets rise but on the other side, the liabilities of the customer increases by an equal amount – leaving no change in the **net** position of the sector.

The only way the private domestic sector can increase its net financial assets is through transactions with the government or external sector – for example, by acquiring a government bond or buying a foreign government bond (or a foreign corporate bond). These two points are key MMT insights.

Once we understand the interlinked nature of the three sectors then it is a simple step to realise that if one sector has improved its position by the net acquisition of financial assets, following a financial surplus, at least one other sector must have reduced its net financial assets or run a financial deficit.

The flow-of-funds framework allows us to understand that the funds a particular sector receives during a period from current receipts, borrowing, selling financial assets, and running down cash balances have to be equal to the total of its current expenditures, capital expenditures, debt repayments, lending, and accumulation of cash balances. The approach clearly allows us to trace the uses and sources of funds for each sector.

It should be emphasised that the flow-of-funds approach is based on accounting principles rather than being a behavioural (theoretical) framework for understanding the factors, which explain the magnitudes of these flows. Relatedly, there are no insights into the adjustment processes that govern the change in net financial assets in each sector.

That is not to be taken as a criticism of the approach – it is merely an observation. It also doesn't reduce the utility and insights that the approach provides. Often economists like to denigrate analyses that manipulate accounting identities as if they are too low brow. But any approach is valuable if it provides useful ways of thinking.

Causal relationships

From the discussion above, it is clear that a non-government surplus is the same thing as a saving flow and leads to the net accumulation of financial assets. By the same token, a deficit reduces net financial wealth. If the private domestic or external sector runs a deficit, it must either use its financial assets that have been accumulated in previous years (when surpluses were run), and reduce its bank deposits, or it must issue new IOUs to obtain bank deposits to offset its deficits. 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, if the external or private domestic sector runs a surplus then it will be accumulating net financial assets. This will take the form of financial claims on at least one of the other sectors.

As we will discuss later, it is misleading to apply terminology such as 'dis-saving' or 'borrowing' to the sovereign government, which issues the currency.

While we have identified an accounting relationship between the sectoral balances, we can say something about causal relationships between the flows of income and expenditure and the impact on stocks.

Individual spending is mostly determined by income. For the individual, it is plausible to argue that income 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. Still, at the level of the individual household or firm, the direction of causation runs from income to spending even if the correspondence between the two flows is not perfect.

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 by running a deficit, it can issue liabilities to finance purchases. Another household or firm will accumulate these liabilities as net financial wealth. Alternatively, they might allow the government to run a fiscal surplus. Of course, for this net financial wealth accumulation to take place, we must have one household or firm willing to deficit spend, and another household, firm, or government willing to accumulate wealth in the form of the liabilities of that deficit spender. So 'it takes two to tango'. However, the decision to deficit spend 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 deficit spend. Still, it is true that the household or firm will not be able to deficit spend unless it can sell accumulated assets or find someone willing to hold its liabilities, such as a bank through the creation of a loan.

In the case of a sovereign government, there is a special power - the ability to tax, that guarantees that households and firms will want to accumulate the government's debt. We conclude that while causation is complex, it tends to run from individual deficit spending to accumulation of financial wealth by another economic entity, and from debt to financial wealth. Since the accumulation of a stock of financial wealth results from a surplus, that is, from a flow of saving, we can also conclude that causation tends to run from deficit spending to saving. At the sectoral, rather than individual, level the same principles apply. Thus, 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.

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 above, 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.

In MMT, we differentiate between horizontal and vertical transactions within the economy. Horizontal transactions occur between people and firms within the non-government sector (for example, purchases of goods and services, borrowing from banks). Vertical transactions occur between the government sector and the non-government sector (for example, government spending and taxation).

Horizontal transactions do not add to the stock of net financial assets held by the non-government sector. 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 above, 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. Likewise if households choose to deficit spend, that is, spend more than their flow of annual income, then they may secure bank loans. In this case the net asset position of the private sector is unchanged. These are horizontal transactions.

However, if the domestic private sector taken as a whole spends more than its income, it must issue 'outside debt' held as 'outside wealth', which would be held by the foreign sector, but the stock of net financial assets held by the non-government sector (private domestic plus foreign) is again unchanged, since these are horizontal transactions.

The initiating cause of the private sector deficit is assumed to be a desire to spend more than income, so the causation mostly goes from deficits to surpluses and from debt to net financial wealth. While we recognise 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 and acquire financial assets.

Vertical transactions do add to the stock of net financial assets held by the non-government sector. On the other hand, assume that a fiscal deficit occurs (perhaps as a result of increased government spending), and for simplicity the CAB is zero, then the private sector achieves a net increase in its stock of financial assets. This transaction between the government and private sector is referred as a vertical transaction and, in this instance, leads to an increase in net financial assets held by the non-government sector. On the other hand, if the government runs a fiscal surplus (by taking net spending out of the economy), with the CAB zero, the non-government sector (specifically the private sector) suffers a loss in its net holdings of financial assets.

In this section, we demonstrate how a flow-of-funds approach to the analysis of monetary transactions highlights both the importance of the distinction between and vertical and horizontal transactions and the fundamental accounting nature of the so-called government 'budget' constraint (GBC) identity, which we will refer to as the government fiscal constraint.

5.5   Balance Sheets

Following Ritter, we can present a very simple 'generalised balance sheet', which would apply to any sector, as being depicted in the following T-account, Figure 5.2

Several points are worth noting. Real assets are treated differently to financial assets because they only appear on the balance sheet of the owner. Financial liabilities are different because their existence as debt (to some other sector) means they will be matched by a financial asset on at least one other sector's balance sheet.

Financial assets denote monetary amounts owned by that sector, which by the same logic as before means that there will be a matching liability on at least one other balance sheet within the system.

When we consider the monetary system as a whole, we conclude that financial assets and financial liabilities net to zero – that is, the total value of the financial assets equals the total value of outstanding liabilities.

The accounting also tells us that for the overall economy, net worth equals to monetary value of the real assets in the economy

Figure 5.2   A stylised sectoral balance sheet

Assets	Liabilities and Net Worth
Financial assets:	Liabilities
1. Money	
2. Other	
Real assets	Net worth
Σ	Σ

The balance sheet depicts stocks but we can easily see how they might provide us with information about flows, in the way the national accounts does. A stock is measured at point in time (say, the end of the year) whereas flows measure monetary transactions over a period (say, a year).

If we examine the difference between a balance sheet compiled at say December 31, 2015, and a balance sheet compiled at December 31, 2016, we will be able to represent the information in the balance sheet about assets, liabilities and net worth as flow data.

Consider Figure 5.3 (where the Δ symbol refers to changes over the period concerned). Now the entries in the T-account denote uses and sources of funds (that is, flows) over the period of interest. There are two components, one relates to financial assets and the other real assets and net worth.

A given sector (for example, household, firm, government) can obtain funds by increasing their liabilities by borrowing and incurring debt (ΔL). They can apply those funds to accumulating more financial assets (ΔFA) or building cash balances (ΔM).

Figure 5.3   A uses-and-sources-of-funds statement

Uses	Sources
Δ Financial assets (lending)	Δ Liabilities (borrowing)
Δ Money (cash balances)	
Δ Real assets (investment)	Δ Net worth (saving)
Σ	Σ

If we wanted to complicate matters we could decompose ΔFA, ΔM and ΔL further, by recognising that a given sector can also sell existing financial assets or run down cash balances to obtain new funds. Similarly, it might use funds to reduce liabilities (pay down debts). So the entries in Figure 5.3 are to be considered **net transactions**.

The second source and use of funds for a sector relates to changes in Real assets (ΔRA) and the change in net worth (ΔNW) over a given period.

In the national accounts framework (see Chapter 4), we considered the division between the capital account and the current account, where the former related to investment in productive capacity and the latter referred to recurrent spending and income. The capital account measured transactions, which change the real assets held and the net worth of the economy.

What do we mean by a change in real assets? In the national accounts, we considered gross capital formation or investment, which is defined as expenditure on productive capital goods (for example, plant and equipment, factories). This is a use of funds by firms in the current period. Depreciation represents the difference between gross and net investment. For now though we abstract from that real world complexity.

Finally, we consider the change in net worth for a sector in a given period is the residual after all the uses and sources of funds have been accounted for. From an accounting perspective, net worth is equal to the difference between total assets and total liabilities.

It follows that a change in net worth over the period of interest is equal to the difference between the change in total assets and the change in total liabilities. If total assets increase by more (decrease by less) than total liabilities increase (decrease) then the net worth of the sector has risen.

Another way of thinking about the change in net worth, which is a flow of funds, is to link it to the national accounts concept of saving.

In the national accounts framework, we consider household saving, for example, to be the difference between consumption (a use) and disposable income (a source). This concept generalises (with caution) to the statement that the surplus of a sector is the difference between its current revenue and its current expenditure.

What happens to the flow of surplus funds? If the current flow of income is greater than the current expenditure, then at the end of the period, the sector would have accumulated an

increased stock of total net assets – either by increasing the actual assets held and/or reducing liabilities owed.

The surplus between current income and current expenditure has to be matched $-for-$ by an increase in the stock of total net assets. We have already discussed total net assets above but in different terms.

We defined the change in net worth over a period as the difference between the change in total assets and the change in total liabilities. That difference is exactly equal to the surplus of current income over current expenditure.

Thus, from an accounting perspective, we can consider saving to be the change in net worth over a period.

Figure 5.3, however, only implicitly includes the current account transactions – the flow of current income and expenditure – inasmuch as we have defined the change in net worth (ΔNW) to be the difference between the two current flows.

The simplicity of Figure 5.3, however, makes clear an essential insight – if a sector is running a deficit (that is, it is spending more than it is earning or in the parlance used above, it is investing more than it is saving) then it must obtain the deficit funds from its available sources:

- Increased borrowing
- Running down cash balances
- Selling existing financial assets

Conversely, a sector that it running a surplus (that is, it is spending less than it is earning or in the parlance used above, it is investing less than it is saving) must be using the surplus funds to:

- Repay debt
- Build up cash balances
- Increase its financial assets (increasing lending)

We also have to be cautious in our terminology when considering the different sectors. If we are considering the household sector, then it is clear that if they spend less than their income and thus save, they are deferring current consumption in the hope that they will be able to command greater consumption in a future period. The increase in their net worth provides for increased future consumption for the household.

Similarly, for a business firm, if they are spending less than they are earning, we consider them to be retaining earnings, which is a source of funds to the firm in the future.

We consider the private domestic sector as a whole (the sum of the households and firms) to be saving overall, if total investment by firms is less than total saving by households. From the national accounts, we consider that households save and firms invest.

However, in the case of the government sector such terminology would be misleading. If the government spends less than they take out of the non-government sector in the form of taxation we say they are running a fiscal surplus. A fiscal deficit occurs when their spending is greater than their taxation revenue.

But a fiscal surplus does not increase the capacity of the sovereign government to spend in the future, in the same way that a surplus (saving) increases the capacity of a household to spend in the future.

As we saw in Chapter 1, a sovereign, currency-issuing government faces no intrinsic financial constraints, and can, at any time, purchase whatever is for sale in the currency that it issues. Its capacity to do so is not influenced by its past spending and revenue patterns.

Figure 5.4 provides the most comprehensive framework for analysing the flow-of-funds because it brings together the current transactions (income and expenditure), the financial transactions, and the capital transactions that we have dealt with earlier. The capital and financial transactions are captured in changes to the balance sheet (Figure 5.2).

Note when we talk about the sovereign government we are excluding the levels of government that do not issue the currency. State and local governments are more like households or firms in that respect, although they do have the capacity to tax and issue fines.

Figure 5.4 A complete sector uses-and-sources-of-funds statement

Uses	Sources
Current expenditure	Current receipts
Δ Net worth (saving)	
-------------------------	----------------------------
Δ Financial assets (lending)	Δ Liabilities (borrowing)
Δ Money (cash balances)	
Δ Real assets (investment)	Δ Net worth (saving)
Σ	Σ

The transactions above the dotted line comprise the income statement and record current expenditure (uses). The balancing item above the dotted line constitutes the change in net worth (ΔNW) or 'saving'.

The changes in the balance sheet are shown below the dotted line and the balancing item is once again, the change in net worth (ΔNW).

You can see that we could cancel out the change in net worth (ΔNW), which is the balancing item in both the income statement and the change in the balance sheet. This would leave us with the accounting statement that that sources of funds to a sector through current income and borrowing must, as a matter of accounting, be used – for current expenditures, investment, lending, and/or building up cash balances.

5.6   The Flow of Funds Matrix

The T-accounts tracing the sectoral sources and uses of funds can be summarised for all sectors in the economy by the Flow-of-Funds Transactions Matrix, a stylised version of which is shown in Figure 5.5.

The overriding accounting rule that governs the presentation of the flow-of-funds accounts is that for the economy as a whole and for each sector in the economy the total sources of funds must be equal to the total uses of funds. Remember that sources of funds provided by the various sectors in the economy are used by those sectors.

Figure 5.5 (taken from Ritter, 1963) shows three sectors and the total economy. At the most aggregate level, the three sectors could be the private domestic sector, the government sector and the external sector.

Figure 5.5   A stylised three sector flow-of-funds matrix

	Sector A		Sector B		Sector C		Total Economy	
Flow	U	S	U	S	U	S	U	S
Saving (ΔNW)								
Investment (ΔRA)								
Lending (ΔFA)								
Cash balances (ΔM)								
Borrowing (ΔL)								

For each period being accounted for, the statistician would record the flows of funds that related to each of the row categories in the matrix. Most importantly, we have learned that for every deficit sector, which saves less than it invests, there has to be offsetting surpluses in at least one other sector.

Lawrence S. Ritter (1963:228-229) called the economy-wide flow-of-funds matrix:

> ⋯ an interlocking self-contained system … [which] … shows, for a specified time period, the balanced sources-and-uses-of-funds statements for each sector, the interrelations among the sectors, and the aggregate totals of saving, investment, lending, hoarding, and borrowing for the economy as a whole. Any one sector may invest more or less than it saves, or borrow more or less than it lends. However, for the economy as a whole, saving must necessarily equal investment, and borrowing must equal lending plus hoarding.

Thus a deficit sector, which saves less than it invests, must be offset by at least one other surplus sector to net the flows to zero.

What are the practical uses of presenting economic data in this way?

Various uses can be made of the information provided in the flow-of-funds accounts.

The flow-of-funds accounts provide information of all financial flows within the economy on a sector-by-sector basis. They allow researchers and policy makers to understand how funds flow from one sector (say the household sector) through the banking system and onto final users by, for example, firms engaged in productive investment.

They also allow researchers and policy makers to monitor major economic trends such as the changing indebtedness of the sectors included and the sources of funding for the respective sectors. For example, an understanding of the flow-of-funds accounts would have provided insights into the growing indebtedness of the private sector prior to the Global Financial Crisis in 2008 and perhaps, alerted policy makers to the likely financial instability arising from these trends.

Economic researchers also use the flow-of-funds accounts to study saving patterns in the economy. The accounts can tell us where the savings of a sector are being deployed. The accounts can tell us which sector(s) are accumulating surpluses or deficits and the division between financial and real assets. They also allow us to understand patterns of gross capital formation.

Economic researchers also use the flow-of-funds accounts to examine the dynamics of such concepts as household wealth. We can learn how household balances sheets change over time and how that wealth is composed. For example, one of the hallmarks of the period leading up to the Global Financial Crisis in many countries was the shift in household wealth to riskier categories, such as share holding sourced from margin loans. The shift in importance in overall wealth from the more secure home mortgages to more risky sources of wealth was significant because it exposed the economies to an increased risk of financial instability.

Finally, central banks use the flow-of-funds accounts to help them estimate the sensitivity of the economy to changes in the availability of credit.

Flow of funds accounts and the national accounts

The flow-of-funds accounts complement the national accounts and the balance of payments accounts, which are produced by national statistical agencies on a regular basis, as a way of measuring economic activity in total and across the broad economic sectors.

We will consider the balance of payments accounts in Chapter 16.

There are important differences between the flow-of-funds accounts and the national accounts, which can be summarised as:

- The national accounts contain no data pertaining to financial transactions – borrowing, lending or changes in cash balances. Only non-financial transactions are measured. The flow-of-funds accounts fill that void.

- The national accounts focus on the current flows of final expenditure, output and income. As we saw in Chapter 4, transactions that involve so-called double counting or intermediate transactions are excluded from the calculations of final expenditures. The flow-of-funds accounts allow us to trace transactions involving assets that have been created in past periods.

- The structure of the national accounts is such that consumer durable expenditure is included under current expenditure when conceptually it should be considered investment activity. In the flow-of-funds accounts all sectors can invest and save.

Appendix

A graphical framework for understanding the sectoral balances

From Equation (5.4) we learned that the sum of the sectoral balances is zero as a matter of accounting – so $(I - S) + (G - T) + (X - M) = 0$. We can construct an axis defining four quadrants. Figure 5.6 depicts the government fiscal balance on the vertical axis and the external balance on the horizontal axis.

So all points above zero on the vertical axis represent a government fiscal surplus *(G < T)* and all points below zero on the vertical axis denote government fiscal deficits $(G > T)$.

Similarly, all points to the right of the zero line on the horizontal axis denote external surpluses $(X > M)$ and all points to the left of zero on the horizontal axis represent external deficits $(X < M)$.

Clearly, the origin of the axis denotes a position where all balances are equal to zero. From the insight gained from Equation (5.4), we also know that when the private domestic balance is zero $(S = $ I$)$, then the government fiscal deficit (surplus) has to equal the external deficit (surplus). From Figure 5.6, the diagonal 45-degree line thus shows all combinations of government fiscal balances and external balances where the private domestic balance is zero $(S = I)$. We will refer to this as the **SI line**.

We can use that knowledge to determine the segments of the diagram where the private domestic balance is in surplus $(S > I)$ and in deficit $(S < I)$. To make it easier, we can express the sectoral balances equation (5.4) in a different way:

(5.7)   *(S - I) = (G - T) + (X - M)*

Equation (5.7) is just another way of expressing the accounting rule but in this case isolates the private domestic balance on the left-hand side.