Macroeconomic Concepts and Indicators

This chapter is all about a nation’s macroeconomy – it introduces the key concepts and indicators business managers, policymakers, and analysts look at and talk about when they describe the state of a nation’s economy and diagnose whether or not it is healthy, provides new business opportunities, or needs some policy intervention for improvement. To understand the macroeconomic environment you and your business operate in, you want to know the relevant terms, understand the concepts, and know what indicators to look at.

A firm’s revenue in any given year is a result of a combination of forces that are directly related to the company, its industry, and the domestic and international macroeconomic environment. Depending on the firm and the year, these factors might alternate in importance. In some years, macroeconomic factors might not be very important; but in others – particularly at the beginning or end of a recession – changes in macroeconomic conditions can be very important. Furthermore, firm and industry-specific forces tend to lose and macroeconomic factors tend to gain prominence the more one looks into the future. For investment projects with time horizons of five, ten, and even more years, information about whether the general economy is going to grow or not, whether interest rates will be high or low, whether prices in general will be rising at a fast or a low pace is crucial.

It is, therefore, important for a successful business manager to understand the macroeconomic environment his or her business is operating in. He or she must be able to interpret current and past data and developments, to understand current and past government policies, and to form expectations about future developments as an input to his or her business strategy. The purpose of this book is to enable you to do that.

As you will see, some of the material you are going to read sounds pretty technical. Macroeconomics is filled with jargon. This jargon is necessary, however, because the economy is complex and we need to be precise with our language and our thinking to deal with that complexity without getting confused. The people who write about the economy break their stories down by using specific terminology. If you are to understand what these experts are saying, you must master the terminology.

Good business managers continuously monitor the development of the markets for their products, observing prices and quantities of their own and competing
products. We usually divide up the analysis of such markets into supply components and demand components. Supply-and-demand components convey different meanings. For example, cell phones are bought and sold at a certain price. That price and the quantity of cell phones sold can vary over time, depending on demand and supply factors. Demand factors determine how many people want to buy cell phones and how much they are willing to spend on them. Supply factors determine how many cell phone firms decide to produce at given production costs and sales prices. The number of cell phones actually traded in the market during a particular year stems from the interactions of demand and supply factors. We might say that cell phone sales increased this year because some new apps made them more attractive to the consumer. That would be a demand story. Or we could say that cell phone prices fell because of the decline in the prices of rare earth metals used for their production. That would be a supply tale.

We do the same in macroeconomics. Here, however, we are not concerned with the quantity and price of an individual good or service, but with the quantities of all the goods and services produced on the territory of a nation and their average price, the nation’s price level. At the heart of macroeconomics is aggregation. Instead of the demand for an individual good or service, we are interested in aggregate demand (AD), i.e., the demand for all goods and services produced. Similarly, we are interested in the aggregate supply (AS) of all goods and services produced on the territory of a nation. It might be helpful to note that very much, though not all, of the discussion about changes in a country’s economy tends to focus on AD factors, because these are what drives the economy in the short run. Many of us are so busy with the short run that we never think much about the long run. That means that we often think that all of macroeconomics is about aggregate demand. But that isn’t true and we hope to explain why in this book. AS factors tend to be more important in the long run. As the late Paul Samuelson, winner of the Nobel Prize in economics in 1970 once said: “God gave economists two eyes, one to watch demand, one to watch supply.”

In macroeconomics, we ask these kinds of questions: Why did the economy slow down this year? Why did the recovery begin? How strong will the recovery be? What can monetary and fiscal policy do to achieve better outcomes? What are the prospects for growth of the economy as a whole over the next few years?

In order to answer these and similar questions, we begin with the most comprehensive measure of a nation’s economic activity, gross domestic product (GDP). We look at GDP from three different perspectives: GDP as aggregate demand, as aggregate supply, and as aggregate income (AI). The economic circuit shows why these three have to be the same. Next, we decompose GDP into its quantity component, called real GDP, and its price component. Real GDP is the main vehicle we use to talk about economic growth. We will then consider real GDP as an indicator of a nation’s overall wellbeing. Considering the price component will lead
us to various measures of the nation’s price level and inflation. Finally, we look at various indicators of the nation’s labor force and the state of the labor market.

1.1 GDP: Aggregate Demand, Supply, and Income

Macroeconomics ignores the specific attributes of particular goods or services so that it can concentrate on all of a nation’s production. Instead of the markets for steel or consulting services, we think of the market for all the goods and services produced by the nation taken together. Goods are tangible things such as cars, computers, and umbrellas, or intangible things such as a piece of music downloadable from the internet. Goods are produced and they satisfy the wants and desires of consumers or producers. They are often described as being durables (e.g. cars, washing machines) or non-durables (e.g. food, clothing). They can also be referred to as follows:

<table>
<thead>
<tr>
<th>Types of goods</th>
<th>Final consumer</th>
<th>Intermediate</th>
<th>Raw material</th>
<th>Fixed asset</th>
</tr>
</thead>
<tbody>
<tr>
<td>A good intended for</td>
<td>A good intended as an input into the production of another good (example: steering wheel)</td>
<td>A material extracted from the earth or an agricultural product that will be further transformed by a producer (example: crude oil)</td>
<td>A durable good that will be repeatedly or continuously used by businesses to produce other goods (example: printing machine)</td>
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<tr>
<td>final use by a consumer. Can be durable or non-durable (example: dish washer and breakfast cereals)</td>
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Fixed assets include structures such as commercial or residential buildings or highways, equipment, and intellectual property products.

A service is an intangible which is consumed as it is rendered. Sure, you look beautiful for days after your haircut – but we think of the act of giving the haircut as over when you leave the hair salon. Consumers enjoy lots of personal services like travel, banking, education, medical services, and many more.

Aggregate demand is the total demand for all of a nation’s newly produced final consumer goods and services and fixed assets. Aggregate supply is the total supply of all the nation’s newly produced final consumer goods and services and fixed assets. Okay – we want to talk about the sum or aggregate of all these goods and services. How do we get from the thousands of different goods and services to talking about all of them? Al Capp, the famous cartoonist, had some fun with this idea – he talked about *smoooshing* together all these goods and services into one unit; so he called the sum total of all goods and services a SHMOO.² It turns out that most
countries do not publish statistics on the price or quantity of SHMOOs—but they do use a concept called GDP. What is that?

GDP is the aggregate market value of all final goods and services produced within a nation’s borders during a given period (usually a year or a quarter).

By multiplying the quantities of the goods and services included in GDP by their market prices, we obtain dollar values for all of them, which we can then aggregate, i.e., sum up. For the US, GDP is expressed in dollars. For Japan, GDP is expressed in yen, and for the euro area (the European Union (EU) countries using the euro as their currency), GDP is expressed in euros.

1.1.1 The Economic Circuit

The key to understanding macroeconomics is the economic circuit. The economic circuit describes the circular flow of goods and services and monetary payments through the economy during a given period. In the simplest version of the economic circuit, we divide a country’s entire economy into two sectors: households and firms or businesses. We abstract from the existence of the government sector and the international sector for a moment. The household sector consumes the final goods and services produced by the firm sector. It is also the ultimate owner of all labor, capital, and land in the economy. Capital in this context consists of the stock of fixed assets businesses use in the process of production. That households are the ultimate owners of the firms’ capital is obvious in the case of a hairdresser who owns his own shop and equipment. It is less obvious in the case of a common stock company, but shareholders do own a share in its capital. The firm sector produces final goods and services and new fixed assets using the labor, capital, and land that the household sector makes available to it through the markets for labor, land, and capital. Note that the firm sector includes all production activities from the extraction or production of raw materials to the assembly of the finished products. Thus, all production takes place in the firm sector, while the household sector makes use of the goods and services produced. Note that the distinction between “firms” and “households” is a functional one. An individual person can belong to both sectors at the same time. For example, a private consultant is a “firm” producing consulting services and a consumer at the same time.

The economic circuit describes the flow of labor, capital-use, and land-use services from households to firms and the flow of final goods and services produced by the firms to households. It represents a basic insight from macroeconomics, namely that every buyer on one market is also a seller on another market, and every seller on one market is also a buyer on another market. This is the essence of an exchange economy: Everybody gives something to obtain something else. For example, employees work for their companies in order to receive a salary which they spend on consumer goods sold by these and other companies.
Consider Figure 1.1, which illustrates the economic circuit. Blue arrows indicate flows of goods and services between households and firms in one direction. Black arrows indicate flows of payments between households and firms in the opposite direction. The upper half shows the flows of final goods and services from firms to households. These flows are intermediated through markets for goods and services. The lower half of the circuit shows the flows of labor, land-use, and capital-use services from households to firms. These flows are intermediated through markets for labor, capital, and land. Firms use them as inputs to production. They compensate households for making these factors of production available by paying wages for labor, rents for the use of land, and interest and profits for the use of capital. These payments constitute the household sector’s income in any given period. Household expenditures for goods and services become the revenues of the firms. Firms use their revenues to pay wages, rents, interest, and profits to the households.

Households use their incomes to finance their expenditures for goods and services. If they spend less than their current incomes, they save, i.e., they increase their net wealth. If they spend more than their current incomes, they dis-save and reduce their net wealth. Financial markets and institutions serve to intermediate income flows between those households who save and those who dis-save. But how can the household sector as a whole save? If the country’s total stock of land is fixed, all households together can save only by buying additional fixed assets which they then make available to the firm sector. Remember that the households are the
ultimate owners of all capital in the economy. The household sector may, in any
given period, increase the stock of capital available for production. We call this
investment.

The essence of the economic circuit is that these flows must be equal in value in
any given period. That is:

- total firm sales (value of production) equals total household expenditures (value
  of purchases);
- total remuneration of inputs to production equals total household income;
- total value of production equals total income paid to households;
- total household income equals total household consumption expenditures plus
  saving;
- total household saving equals total purchases of capital goods or investment.

These are accounting identities, i.e., they must always be true. It cannot be other-
wise. But, you will say, what about unsold goods that have been produced? We treat
them as changes in inventories and include them in investment, because they can be
sold in future periods.

The economic circuit indicates that any increase in household income must lead
to an increase in household expenditures, which must lead to an increase in firm
revenues and to an increase in wages, rents, interest, and profit paid to households.
Thus, one household’s expenditure ultimately becomes another household’s income.
For example, if the price of apples goes up, the income of apple farmers usually
increases. This implies that, while the demand for apples by nonfarm households
may fall due to the increase in price, aggregate household expenditures on all
final goods and services will increase. Understanding this is key to understanding
macroeconomics.

While the flows represented by the blue arrows are flows of goods and services,
the flows represented by black arrows are payment flows, which are executed using
the economy’s means of payment, money. Each unit of money may be used in
multiple payments during a period. For example a dollar note can be used during a
period first by a customer to buy bread, and then by the baker to pay the wages of
the baker’s employee, and then by the employee to buy an apple for the employee’s
family. We call the average number of times each unit of money is used in payments
during a period the velocity of money. Thus, another identity from the economic
circuit is that

\[(\text{Number of units of money}) \times (\text{velocity of money}) = \text{total value of expenditures for final goods and services.}\]

Figure 1.1 indicates the fundamental identities by showing that one can measure the
total value of output, or GDP, of an economy at three points. GDP can be regarded as
the total value of expenditures for final goods and services. This is aggregate
demand. GDP can be regarded as the total value of goods and services produced. This is aggregate supply. GDP can be regarded as the total of all incomes paid to the household sector. This is aggregate income. Because of the economic circuit, it must be true that aggregate demand equals aggregate supply, and aggregate supply equals aggregate income, and, therefore, aggregate demand equals aggregate income.

Now, when we say that these identities are accounting identities, we say that they must be true ex post, i.e., when all market transactions have been executed, all goods and services have been produced, delivered, consumed, or invested (think of this as at the end of a period). This is how we measure GDP statistically.

Ex ante, before this has happened (think of this as at the beginning of a period), these identities are not necessarily true. This is because aggregate demand is planned and decided by the households, while aggregate supply is planned and decided by the firms. Wages, rents, interest, and profits are paid by firms, while incomes are received and expended by households. Since there are different decision makers involved, nothing guarantees that their plans are compatible with each other. For example, suppose that firms plan to produce less at current prices than households desire to buy and to employ less capital and labor than households wish to make available at current wages and interest rates. As a result, incomes are lower than desired and households cannot finance their expenditure plans. At the same time, there is idle capital and unemployed labor. The fundamental identities do not hold ex ante in that case. Alternatively, suppose that some households put the money they do not spend on consumption under their mattresses instead of buying new capital goods. This is called hoarding rather than saving. At given prices, wages, and interest rates, planned savings are lower than planned investment. Again, the fundamental identities do not hold in an ex ante sense.

Ex ante, the equality of aggregate demand, aggregate supply, and aggregate income defines what we call a macroeconomic equilibrium. An important feature of a market economy is that prices, wages, and interest rates adjust every period to achieve such an equilibrium. This gives us a hint for predicting how prices, wages, and interest rates co-move with output, consumption, investment, and employment each period. Analyzing these co-movements will be the topic of the later chapters in this book.

Figure 1.2 gives us an expanded view of the economic circuit. It includes the government sector and the international sector. The government collects taxes from households and firms; it buys goods and services from private firms and employs government workers and civil servants. It can also be an owner of land and capital and receive income from these. The government, in fact, has a hybrid function in the economy, because it uses labor, land, and capital to produce “public goods and services” such as national defense, internal security, law and order, maintenance of infrastructure like roads, etc. Such public goods and services are not traded on markets, and, therefore, cannot be evaluated at market prices. In GDP accounting,
we represent their value by the cost of producing them. Government spending on wages and salaries, capital-use, and land-use services thus become part of aggregate demand, aggregate supply, and aggregate income all at the same time.

Once we recognize the existence of the government in the economic circuit, our fundamental identities must be adjusted. This is because the government can spend more than it receives in tax revenues and finance the difference by issuing government bonds. This gives the household sector another way of saving, namely by buying government bonds. Furthermore, we have to take into account that households have to pay taxes out of their incomes. Thus, we consider total disposable income, which is household income net of taxes. Abstracting from the international sector for now, our fundamental identities are as follows:

- total value of production (firms and government) equals total household consumption expenditures plus government consumption;
- total remuneration of inputs to production equals total household disposable income plus total tax revenue;
- total value of production equals total household disposable income plus tax revenues;
- total household disposable income equals total household consumption expenditures plus saving;

![Figure 1.2 The economic circuit of an open economy with government sector](image-url)
• total tax revenues equals total government spending plus government saving;
• total household saving plus government saving equals total investment.

Next, we turn to the international sector. Firms sell output produced in the country to other countries (exports) and foreign firms sell goods and services and new fixed assets produced abroad to domestic households and the government (imports). As a result, the total demand for domestically produced goods and services now includes the demand from abroad, i.e., exports, and domestic consumption, government expenditures, and investment contain goods and services produced by foreign firms. Since GDP is the value of domestically produced goods and services, we have to subtract imports from the sum total of domestic consumption, government expenditures, and investment. The difference between exports and imports, or net exports, thus becomes part of aggregate demand.

Foreign firms may employ domestic workers, land, and capital for production and pay wages, rents, interest, and profits to domestic households, while domestic firms may use foreign labor, land, and capital for their production and pay incomes to foreign households. Thus, there is also a net flow of factor incomes between the domestic and the foreign economies.

Once again, there are some fundamental identities, and we can measure GDP as aggregate demand, aggregate supply, and aggregate income. We look at these identities in more detail in the next section.

1.1.2 National Accounting

The economic circuit is the foundation of national accounting, the statistical measurement of economic activity. In the US, national accounting is a job done by the Bureau of Economic Analysis (BEA) (www.bea.gov), which is part of the federal government. BEA’s accounting system is called National Income and Product Accounts (NIPA). It is the analogue of an income and expense statement for the entire economy.

There are a few important accounting principles behind NIPA. The first is double-entry bookkeeping. Every economic transaction recorded in NIPA must appear in two different places, once as a source of revenue and once as an expenditure of resources. These different places may well be in the accounts of two different sectors. For example, wages paid by firms will be recorded as an expense in the business sector’s production account and as a revenue in the household sector’s income account. Double-entry bookkeeping conforms with the principle of the economic circuit that one agent’s purchase must be another agent’s sale.

The second important principle behind NIPA is accrual accounting. This means that a transaction is recorded at the time when the commitments to deliver and to pay are incurred and regardless of when the pertinent transactions are actually executed. This is in contrast to cash accounting, where transactions are recorded at the time of their execution. For annual national accounts, the difference between
accruals and cash accounting plays no big role for consumer purchases of food or clothing, for example. But it does play a role for transactions that involve significant gestation periods, e.g., a government’s purchase of a new submarine.

The third important principle is that NIPA includes some imputations of the value of goods and services produced for own use or for non-market transactions. Cases of own use include farm production for consumption by the farm household, and the value of the services provided by owner-occupied housing. The value of the service provided by the use of a tenant-occupied house is measured by the rent paid. If the same house is owner-occupied, no rent is paid although the same service is being produced and consumed. In order to assure that changes in ownership do not affect the measurement of economic activity, the rent paid for a comparable house is imputed for the use of an owner-occupied house.

The most important case of non-market transactions is the government’s production of public goods and services. Their value is accounted for by the cost of production. Illegal activities such as drug dealing or prostitution are not included in NIPA at all. In contrast, the 2010 European System of National and Regional Accounts (ESA) published by the EU’s statistical office, Eurostat, allows governments to include estimates of such activities in their national accounts.

The final accounting principle is periodicity and territoriality. NIPA is compiled and published in two versions, quarterly and annually based on the calendar year. It measures economic activities on the territory of the US.

Without going into too much detail, we show how US national accounting works and how it is linked to the concept of the economic circuit. We recognize productive activities in two sectors of the economy: the firm or business sector and the government sector.3 Domestic firms produce goods and services for sale to domestic and foreign households, firms, and governments. We begin with the production account of an individual domestic business (Table 1.1). For the sake of brevity, we write “goods” instead of the more proper “goods and services.” On the right-hand side, the account reports all payment inflows to the business from selling final and intermediate goods to domestic households, other domestic businesses, and the domestic government as well as foreign firms.

The left-hand side reports all the expenses incurred by the firm. These consist of the payment for purchases of intermediate goods, the compensation of employees, i.e., wages and salaries including any supplements, rents paid for buildings, interest paid on loans, taxes on production and imports such as payroll taxes or sales taxes, non-personal property taxes, federal excise taxes, and import and export tariffs, less production subsidies such as farm subsidies. Note that all purchases of foreign goods are considered purchases of intermediate goods, since the domestic business as a minimum provides the services of bringing the imported goods to the domestic retailer or consumer. The difference between all revenues and all expenses is called gross operating surplus. It is split up into the consumption of fixed capital or...