2

International Finance: Institutional Background

Before we can learn about topics such as currency futures and options, currency swaps, the behavior of exchange rates, the measurement of exchange risk, and valuation of real and financial assets in the presence of this risk, we need to understand a much more fundamental issue: namely, money. All of us are aware that money exists and that it is quite useful. Still, a review of why it exists and how it is created is crucial to understanding some of the finer points of international finance, such as how the ownership of money is transferred across countries, how a central bank's balance sheet is maintained, how money from one country can be exchanged for money from another, and so on. Government policy with respect to the exchange rate (the price at which this buying and selling of currencies occurs) is also an important institutional aspect.

This chapter is structured as follows. First, we explain how money gradually evolved from a commodity with an intrinsic value to fiduciary money whose value is based on trust, and how the role of banks has changed accordingly. In section 2.2 we consider international banking transactions. This then leads to our discussion, in section 2.3, about international banking (often still called eurobanking). The emergence of the international bond market is also explained in that section. We then turn to two more macro-oriented issues: the balance of payments and its relation to exchange transactions (section 2.4), and the relation of government policy to the exchange rate (section 2.5).

2.1 Money and Banking: A Brief Review

In this section, we first review the role of money. We then look back a few millennia and explain how money has evolved over time from a bulky, commodity-type physical object into its current form, a record in a bank's electronic memory.

Figure 2.1. Baroque open-market policies. (Fresco, probably by J. M. Rottmayr (1656–1730), in the cupola of the Karlskirche, Vienna. Author's photo.)

2.1.1 The Roles of Money

Money has to do with buying and selling. The need for money arises in any economy in which economic units (for example, households, tribes, or fiefdoms) start to trade with each other. Pure, moneyless barter is inconvenient. To make a deal, a hungry blacksmith does not want to wander around until he meets a farmer whose horse has lost a shoe. The blacksmith would rather compensate the farmer for the food by giving him something called money. The advantage of paying in money rather than in horseshoes is that the farmer can then spend the money on other things if and when the need arises, and on any goods he chooses. Thus, trade and exchange with money are much easier, and the costs of searching for someone who needs exactly what you are selling at a particular point in time are greatly reduced if the buying and the selling bits can be separated.

Three conditions are needed for money to be a successful least-cost medium of exchange. First, it must be storable; the farmer would not like the unspent money to evaporate or rot. Second, it must have a stable purchasing power; the farmer would not like to discover that his hoard of money can buy a far smaller amount of goods than he had anticipated. This, in turn, requires that the stock of outstanding money must not rise substantially faster than the volume of transactions. Third, money must be easy to handle. Once these conditions are met, money can fulfill its role as the *least-cost medium of exchange*. When prices are expressed in units of money, money also acts as a *unit of account* or *numéraire*. Finally, money can also be lent and borrowed, which allows one to transfer purchasing power over time in a low-risk fashion.

2.1.2 How Money Is Created

In this section we trace the development of money from commodities and metal coins in early

economies to privately issued money and, more recently, to official currency notes issued by the central bank of a country, or even electronic claims representing the right to withdraw currency notes.

2.1.2.1 Official Metal Coins

In relatively primitive economies, standard commodities played the role of money. In prehistoric Europe, domestic animals were used as unit of account. In fact, the Latin word for money, *pecunia*, simply derives from *pecus*, cattle. Also the ancient Greek silver *talanton* ("weight") betrays its links to the old practice of using domestic animals as money: the original talent had the shape of a sheepskin, and it was about as heavy as a good-sized lamb—one slave could carry just one *talanton*.

Only cowboys, at best, would think of herds of cattle as being easy to handle. The ascent as a medium of exchange of one particular class of commodities, namely precious metals, occurred because for a given amount of purchasing power, precious metals are far less bulky and easier to transport than cattle. Second, precious metals do not rust. And third, production was and is sufficiently costly to ensure that the stock of rare metal does not grow much faster than the economy as a whole, thus ruling out sudden inflation due to a rapidly expanding money stock.

Early gold and silver money was defined by its weight. The *as*, early Rome's basic currency unit, actually served as weight unit too: it was a cast piece of bronze weighing about $\frac{1}{3}$ kg. Likewise, almost all medieval European states had a pound or a *libra, livre*, or a *lira* unit of account, referring to 330–500 g of silver (see panel 2.1 and table 2.1). (Also *mark* was originally a weight—about $\frac{1}{4}$ kg—as was *peso*, from the Latin *pensum*, meaning weight.) What is striking is that the current value of the British or Irish or Maltese pound, not to mention the Turkish or late Italian lira, is not anywhere near the value of 370 g of silver. This *debasing* of the currency started quite early. One problem was that people reduced the true precious-metal content by melting down their coins, adding some cheap metal, and reminting the alloy.[1] To stop this practice—or, cynics might say, to monopolize it—the local lord, or seigneur, of the fiefdom installed an official mint to which people could bring precious metals for minting. The seigneur then imprinted his quality stamp on the coins in return for a commission or tax, the *seignorage*. This was one way that governments earned money. Later, governments made the issuing of coins their sole monopoly. This allowed them to become poachers themselves and reduce the gold or silver value of their own coins. France's King Philippe Le Bel (Philip the Fair) was known in Flanders as, among other things, *Flup de munteschroder* (Flup the coinscratcher). The official minting monopoly meant that the rulers could produce a coin at a cost below its purchasing power and make a substantial profit—still called *seignorage* in a broader sense. Debasing another country's currency was not uncommon either: it was just part of economic warfare. For example, Philip the Bold, first duke of Burgundy, minted low-alloy replicas of the English *noble* and used them to pay for imports from England.[2]

In 1158, England's King Henry II fixed the financial pound on the basis of the weight standard of the French city of Troyes (Troy, in English) in the county of Champagne, then a leading European trading center. (In France, the leading currency was the

livre Tournois (the Tournois pound)—20 *sols*, each consisting of 12 *deniers*—from Tours; its rival had been the livre Parisis—20 *sols*, each consisting of 15 *deniers)*.

The *troy pound* (5760 gr.) consisted, Roman style, of 12 *troy ounces* (480 gr.), each worth 20 *pennyweights* (24 gr.). There was a 16 ounce *pound avoirdupois* too, fixed at 7000 gr. by Henry VIII, but that was for regular weighting. The *troy mark* was 8 troy ounces or 160d. and the *crown* was worth one-quarter pound or five shillings or 60d. The *troy ounce* is still being used nowadays for precious metals; it is 31.103 476 8 g.

Sterling is not an indication of weight but of quality for silver; it derives, like the old French *esterlin*, from Easterling, the name for a member of the German *Hansa*, a league of trading cities. Cynics might conclude that "pound sterling" means "a French coin of German quality," but you did not hear *me* say this.

Like the mark, the pound was originally just a unit of account: while there were shilling coins (silver) and crown coins (silver and gold), there was no silver pound coin as that would have been inconveniently bulky and heavy. Henry VII first minted gold pounds in 1489. Its weight was 0.5 troy ounce, 23kt (96% pure), soon lowered to 22kt (92%) under Henry VIII. This coin was dubbed *sovereign* because it showed the king on the obverse.

The *guinea* originally referred to new pound coins (1663), made of gold from the Gulf of Guinea (Ghana, the Gold Coast). The new, unworn coins traded at a premium over the old. With gold appreciating relative to silver, the gold-based guineas and sovereigns further rose against the silver-based shilling (up to 30s. per guinea). By the twentieth century, the guinea had become just a unit of account meaning 21s., and since 1967 it has just been a hoity-toity synonym for pound; English barristers, for instance, say guinea when they mean pound. The English (and Irish and Scottish) pound went metric in 1967; at that time, Australia and New Zealand introduced their dollars (initially worth 0.5 pounds).

Panel 2.1. How British is the pound sterling?

This debasing—see parts (a) and (b) of table 2.1—threatened the stability of the money's purchasing power. Fluctuations in purchasing power also arose when the gold and silver mines were exhausted, when Germany opened new silver mines in Joachimsthal and started coining *joachimsthalers* or *thalers*, or when Spain imported huge amounts of gold and silver into Europe from its colonies.

Table 2.1. A family tree of floundering currencies.

(a) Ancient

Name	Original parity	Wikis
as, pl. aeres	*aes* = bronze	Republican Rome; related words: öre, øre (= metal, ore)
sesterce	2.5 *as*	Republican Rome
denarius	4 *sesterce*	Republican Rome, silver; see *denier*
solidus	gold (4.5 g)	Rome, 309 C.E.; called *numisma* in Byzantium

Until 270 B.C.E., the Roman *as*, a cast bronze piece, also doubled as a 1 lb. weight (ca. 325 g—Roman ounces were copied by medieval Europe, but Rome used a 12 oz. not a 16 oz. pound). Then, weight and coin became disjointed, with the coin falling by $\frac{11}{12}$ to 1 *uncia* of weight in a mere 60 years. By 23 B.C.E. it had become a small copper coin. In 270 C.E. its purchasing power was zip, and the coin was abandoned. Rome's *denarius* (10 *as*, later 16 *as*), which still survives as *dinar* in many countries in the Mediterranean or the Middle East, started off as a 4.75 g silver coin. It was still 93% pure (4.5 g) under Emperor Nero. Two hundred years later, in 215 C.E., it was down to 50% silver, and by 260 C.E. to 2.5%.

(b) Charlemagne (ca. 800 C.E.) and medieval

Name	Original parity	Wikis
denier (d.)	silver (1.55 g)	*dinaro, dinero, dinheiro, dinar*
solidus (s.)	12 *deniers*	*solde, solt, sol, sou, suelva, shilling; gros, grosschen, grote*
libra (£)	20s., 240d.	*livre, lira*, pound

The *denarius* was revived by Charlemagne (ca. 800 C.E.) and contained about 1.55 g of silver, a pennyweight or *denier*; 12 *deniers* made one (European, not ancient Roman) *solidus*. *Solidus*, of course meaning "strong," is at the origin of the French *sou* and, after translation, the French *gros* or the German *Groschen* or the Flemish *grote*. Tellingly, both *sou* and *Grosschen* are now bywords for worthless coins. The French *livre Tournois* was often called *franc* after its inscription "FRANCORUM REX," king of the Franks.

(c) Late medieval and modern

Name	Original parity	Wikis
real	1.25s.	Spanish (= Royal). Survives in Saudi Arabia, Yemen, Oman, Iran, Quatar (Ri(y)al); resurrected in Brazil
half crown	2.5s.	U.K. coin until 1967; became quarter dollar in New Zealand and Australia
crown	5s.	survives in Scandinavia or pre-1967 U.K.
florin	4 flemish s.	Dutch Republic, gold; copied after Firenze (Florence)
thaler	2.5 florins	German, silver; aliases: daler, daalder, tolar, or dollar; England (e.g., Macbeth, act 1, scene 1): 1 dollar = 10s.
peso	1 *thaler*	Spain, Latin America
piaster	1 *thaler*	France; Louisiana; now $\frac{1}{100}$ Middle East £, dinar, or lira
écu	3 £*Tournois*	French, gold or silver; *escudo* (PT), *scudo* (IT)
euro	1 ECU	ECU itself originally worth 1 EUA, code for 1 USD

The *thaler* was the first world currency, especially in its Austrian, French, and Spanish versions (Maria Theresa (M-T) dollar, *piaster*, *peso*). The silver M-T dollar still circulates in the Arabian peninsula. Because of its parity, 2.5 florins, the *thaler* was denoted in the same way as the old *sesterce* (2.5 *as*): IIS in Roman numerals ("II" for "2" and "S" for "semi"), compressed into "$" (and thence "$"). The value of the 1958 USD was copied into the European Unit of Account (EUA)—the old European Community bookkeeping unit—and thence into the ECU and the EUR.

2.1.2.2 Privately Issued Paper Money

Another drawback of precious-metal money was that carrying huge amounts of gold from Italy to Scotland, for example, was rather cumbersome and risky. Traders therefore deposited money with international bankers (who often started off as goldsmiths), and used the receipts, or later also bills of exchange and promissory notes, to pay each other.[3] The receipts and bills were convertible into the underlying coins *at sight* (that is, whenever presented to the bank),

and were as good as gold as long as the issuer was creditworthy.[4] Note that a merchant who pays with a promissory note that remains in circulation for years before being cashed in, obtains an interest-free loan. By rolling over the notes, the merchant earns quite an advantage. This is *seignorage* (income from creating money) under a new guise.

Banks themselves then started issuing bills on a regular basis. Early bank notes were rather similar to the modern traveler's check—they were printed and issued by a private bank, in standard denominations, and were convertible at sight into the underlying, official coins. But bankers knew that, on average, only a small fraction of the circulating notes was actually cashed in; most of them remained in circulation for quite some time. This meant that, on the basis of one coin, a bank could issue notes for a much larger total value. Let us see how such an issuing bank's balance sheet is built up and how it creates money.

Table 2.2. Balance sheet of an issuing bank: day 1.

Assets			Liabilities		
Silver coins (owner's input)		120	Equity		120
Gold (A's deposit)		100	Notes issued	to A	100
Domestic credit (loan to B)		200		to B	200
Credit to the government (loan to G)		150		to G	150
Foreign credit	(loan to F)	70		to F	70
	(dollar T-bills)	100		to X	100
Total assets		740	Total notes issued		740

Once you understand the following example, it becomes easier to understand how modern central banks work.

Example 2.1. Consider a bank that issues its own notes. On the bank's opening day, the following five transactions take place:

- A merchant, A, deposits 100 golden crowns in exchange for bank notes. The notes become the bank's liabilities, since they are essentially promissory notes that can be cashed in for true money (gold coins). The merchant's coins go into the bank's vault and are part of its assets.
- Another merchant, B, asks for a loan of 200 crowns. The bank issues bank notes (a liability, since the borrower can cash in the notes for coins), and accepts a promissory note (or any similar claim) signed by B as the offsetting asset.
- The government, G, asks for a loan of 150 crowns. The bank hands over bank notes (that are, again, part of the bank's liabilities), and accepts a Treasury bill (T-bill) or a government bond as the corresponding asset.
- A foreign merchant, F, wants to borrow 70 crowns. The bank issues notes, and it accepts a claim on the foreign trader as the corresponding asset.
- A local exporter, X, wants to convert dollar bank notes into crown bank notes worth 100 crowns. The bank issues crown bank notes (a liability), and it uses the dollar notes to buy foreign T-bills.

By the end of the day, the bank's balance sheet looks like table 2.2. For completeness, I have added 120 crowns of silver initially brought in by the owner/shareholder: there always needs to be some equity.

Table 2.2 shows how bank notes are created, and how an issuing bank's balance sheet is being built up. The issuing bank's own bank notes are the liability side of its balance sheet.[5] On the asset side we find (i) international reserves or "reserves of foreign exchange" (gold and

silver, plus claims on foreigners or governments of foreign countries), (ii) claims on the domestic private sector, and (iii) claims on the domestic government. Note also that most of the money it created is *lent* to the economy, not given away. So by refusing to roll over the loans, the bank can shrink the money supply back to the original size. Even the money brought into circulation as a payment for assets bought from the private sector or the government, as in the above foreign exchange example, can be retired: just sell back the asset into the open market and take payment in notes. This mechanism, as we shall see, is still the basis of monetary policy.

Figure 2.2. Bank notes: echoes from the past. Two new notes and an old one. (a) The Barbados dollar note still reassures the holder that this note is "legal tender for the payment of any amount," that is, cannot be refused as a means of payment. (b) This particular Hong Kong dollar note is issued by HSBC, a private bank, and still bears the message that the general manager (of HSBC) "promises to pay the bearer on demand at its Office here" the amount of ten dollars (in coins). (c) I will translate the 1910 German note bit by bit: *Ein Tausend Mark* (one thousand marks) *zahlt die Reichsbankhauptkasse* (the central teller of the *Reichsbank* pays) *in Berlin* (in Berlin) *ohne legitimationsprüfung* (without proof of legitimation) *dem Einlieferer dieser Banknote* (to the deliverer of this bank note).

Since the production cost of bank notes was quite low, private banks earned a large seignorage. The risk, of course, was that holders of the notes would lose confidence in the issuer, in which case there would be a run on the bank, with many people simultaneously trying to convert their notes into coins. In the United States, for instance, there were widespread runs on banks as late as 1907. John Pierpont Morgan, a New York banker, helped solve the crisis by shipping in a then gigantic USD 100 million (100m) worth of gold from Europe. As recently as 2007, there was a run on an English bank, inaptly named Northern Rock—the first such run since 1866.

To avert such crises in confidence (and probably also to regain the seignorage), most governments then assigned the production of bank notes to a government institution, or at least a semiofficial institution, the central bank.[6]

2.1.2.3 Official Paper Money and the Central Bank

Initially, the official bank notes were still convertible at sight into true money—that is, into the coins issued by the mint or the treasury. For instance, until the mid 1900s, most bank notes still said that the note was "payable on sight" (although the 1910 reichsmark note ominously added that you had to see the Berlin head office for that purpose). Indian rupee bank notes still show a

payable-at-sight phrase: "I [the governor of the central bank] promise to pay to the bearer the sum of x rupees." So do British pounds. Still, for all practical purposes, the central bank's notes have become as good as (or even better than) the treasury's coins, and have become the true underlying money in the eyes of the population. In many countries, coins are no longer legal tender above certain amounts. For instance, the seller of a house cannot be forced to accept payment of the full amount in coins. Thus, money has become a fiduciary instrument. Unlike cattle or gold, modern money has basically no intrinsic worth of its own, nor is the value of modern money based on a right to convert bank notes into gold. Rather, the value of money is based on the trust of the people, who believe that money will have a reasonably stable purchasing power.[7]

One difference between a modern central bank and the private issuing banks of old is that the modern bank notes are no longer convertible into gold. If many central banks still hold gold, the reason is that they think of it as a good investment. Other differences between a modern central bank and a private issuing bank include the following:

- A central bank no longer deals directly with the public. Its customers are commercial banks, foreign central banks, and the government. Commercial banks, in fact, act as liaisons between the public and the central bank. For instance, commercial banks can borrow from the central bank by rediscounting commercial paper (i.e., by passing on to the central bank loans they extended to private companies), or by selling to the central bank the foreign currency they bought from the private sector.
- When a central bank buys a domestic or foreign asset from a commercial bank, it no longer pays entirely in the form of bank notes. Commercial banks demand notes only to the extent that their own customers demand actual currency; most of the payment for the asset the commercial bank sold is credited to its account with the central bank, where it is still payable at sight. One result is that the central bank's liabilities consist not only of bank notes, but also of commercial banks' deposits into their account with the central bank. This liability side (bank notes circulating plus central bank deposits) is called the country's *monetary base* or M_0. The monetary base is still the basis for money creation by commercial banks, in the sense that it provides the backing for the electronic money the commercial banks are issuing—as we shall see in the next section.

SDRs are internationally created funds. They were invented toward the end of the fixed-rate era (1944–74), in an attempt to create an alternative international currency next to the beleaguered USD, with the seignorage going to the IMF member states rather than to the United States. The original SDR was at par with the USD. One difference with the USD is that the original SDR was issued by the IMF rather than by the Federal Reserve. Another difference is that the SDR is a purely electronic currency; an SDR deposit cannot be cashed in for SDR bank notes or coins. Central banks can make payments to each other in SDRs, or convert SDRs into other currencies and vice versa at the going market value of the SDR. When in the 1970s the USD plunged relative to the DEM and JPY, the SDR was redefined as a basket of sixteen currencies. This definition was rather cumbersome, so after some time the basket was again redefined, this time in terms of just five currencies: USD 0.54, DEM 0.46, JPY 34, FRF 0.74, and GBP 0.071. Since the introduction of the EUR, the marks and francs have not been replaced by euros, so the SDR now consists of just USD, GBP, and JPY.

The changes in the SDR composition did not help to make the SDR popular. And in many countries, politicians hated surrendering seignorage to the UN in the first place, disingenuously arguing that the IMF's money was inflationary.

Panel 2.2. The special drawing right (SDR).

A minor change is that the bank's reserves also include special drawing rights (SDRs) held with the IMF[8] (see panel 2.2). But the amounts are tiny, at best.

2.1.2.4 Privately Issued Electronic Money

The official monopoly on the printing of bank notes did not mean that private banks lost all seignorage. Any private bank knows from experience that its borrowers rarely take up the full amount of a loan as notes or coins. Rather, customers tend to leave most of their borrowed funds in a *checking account* (also called a *sight account* or *current account*, in Europe), and make payments by check (United States) or bank transfer (Europe). In short, *loans make deposits*.

Example 2.2. Shengmei gets a car loan from her bank. She almost surely will not withdraw the money in cash, but will pay for the car by check or bank transfer. The car dealer will likewise keep most of the money in a bank account; and if and when the money is spent (to pay wages and suppliers and taxes and so on) it will mostly be via checks or transfers, not cash. The new holders will likewise keep most of the money in their bank accounts, etc.

How does a central bank stop bank runs? At the very least, a commercial bank can always immediately draw down, in cash, all of its deposits of money kept with the central bank. Slightly more generously, the central bank is willing to lend money to a beleaguered commercial bank. But this safeguard should not be abused. An orthodox central bank will not waste taxpayers' money on banks that chose risky assets, so last-resort lending is only possible for short periods (one day at a time) and if the private bank can post excellent security. In addition, many central banks would charge a penalty interest rate so as to make the prospect of such refinancing really a last-resort option.

That, at least, is the Anglo-Saxon theory of last-resort lending. In practice, the indirect cost of letting a commercial bank go belly-up are so high that central banks often dance around the official rules and seek other solutions. Japan's central bank would kindly ask other private banks to take over a sickly colleague, for instance. Many European central banks, and now also the European Central Bank, lend on the basis of subprime assets too; they just take a bigger haircut. In England there was a genuine bank run, with long rows of people queuing up outside the troubled Northern Rock bank, in the fall of 2007—the early months of the "subprime" crisis. When Northern Rock had run out of prime (i.e., first-class solid) assets, the Bank of England also relaxed its lending rules and took second-rate collateral instead. The Treasury (Britain's ministry of finance), in addition, guaranteed all customer deposits with the bank to stop the run. In the end, Northern Rock was entirely taken over by the government.

In general, any sizable bank can probably bet that central banks and/or governments will step in no matter how ineptly the bank was run (the "too big to fail" guarantee): given the web of interbank OTC contracts, an individual failure would have "domino effects," to use the standard phrase, and ruin the credibility and perhaps solvability of all other banks. Japan even flooded its economy with money, bringing down interest rates to near-zero levels, for a bewildering fifteen years so as to nurse back to health the country's commercial banks, badly hurt by the real-estate crash of 1990.

Another first, in the subprime crisis, is that the Federal Reserve even extended its safety net to noncommercial banks (including notably Bear Sterns, an investment bank) and to bond dealers. This probably means they will now be supervised more closely. Lastly, the duration of last-resort lending was extended from days to a few weeks and even a few months.

Panel 2.3. Last-resort lending: putting practice into theory.

The *loans make deposits* principle means that private banks can (and do) extend loans for a much larger volume than the amount of base money that they keep in their vaults or with the central bank. So today, private banks create electronic money (loans recorded in the bank's computer) rather than physical money (bank notes). The ratio between the total amount of money (monetary base plus checking-account money, M_1) and the monetary base (M_0) is the *money multiplier*.

This mechanism again creates the possibility of runs on commercial banks if deposit-holders

want to convert all of their sight deposits into notes and coins. A recent example was the minor run on Hong Kong banks after the 1987 stock market crash, or the run on Northern Rock, an English bank hit by the "subprime" crisis, in 2007. To avert runs and enhance credibility, private banks in many countries must meet *reserve requirements:* they must keep a minimum fraction of the customers' deposits in coins or bank notes, or, more conveniently, in a non-interest-bearing account with the central bank. The central bank also agrees to act as *lender of last resort*, that is, to provide liquidity to private banks in case of a run (see panel 2.3).

Figure 2.3. Hyperinflation in 1946: a one-billion milpengö bank note from Hungary. One milpengö is already a million pengös, so this note stands for 10^{15} pengös.

This whole section is neatly summarized in the following formula:

$$\text{Money supply} = M_1 = m\,M_0 = m \times (D + G + \text{RFX}), \qquad (2.1)$$

where m is the money multiplier, M_0 is the money base (notes and commercial banks' deposits with the central bank), D is credit to the domestic private sector, G is credit to the government, RFX is the reserves of foreign exchange (including gold), and $M_0 = D + G + \text{RFX}$ (equality of the central bank's assets and liabilities).

Equation (2.1) says that the total money supply depends on the money multiplier and the monetary base, which, in turn, consists of domestic credit, credit to the government, and foreign reserves. The equation is also useful in explaining how monetary policy works, which is the topic of the next section.

2.1.2.5 Monetary Policy

Even though central banks generously leave most of the money creation to commercial banks, they still control the process. This control is exerted by the central bank's power over the monetary base and over the money multiplier.

Intervention in the foreign-exchange markets. Central banks can influence the monetary base by buying or selling foreign exchange (changing RFX in equation (2.1)). This expansion of the central bank's asset side is accompanied by an expansion of the liability side (domestic money supply): the central bank pays in notes (or it credits the commercial banks'

accounts with the central bank) for the foreign exchange it buys from the commercial banks. Thus, any change in RFX leads to an identical change in M_0, which then affects the amount of money that private banks can create on the basis of M_0.

Open-market policy. Likewise, central banks can influence the monetary base by restricting or expanding the amount of credit they give to the government or the private sector (that is, change D and G in equation (2.1)). Open-market policy works in the same way as interventions in the foreign exchange market: the central bank pays in notes (or it credits the commercial banks' accounts with the central bank) for the T-bills or commercial paper it buys from the government or from the private banks.

Reserve requirements. Alternatively, the central bank can curb money creation by commercial banks by changing the reserve requirements (changing the upper bound on the multiplier m in equation (2.1)). If banks have to hold more base money per unit of electronic money, the total amount of loans they can extend with a given amount of base money becomes smaller. Around 1990, for instance, India stepped up the reserve requirements to a staggering 50% in order to bring inflation back to single-digit levels. A 50% reserve requirement means that the money multiplier can be at most 2.

Credit controls. The most direct way to control M_1 is to impose limits on the amounts that private banks can lend.

Having examined what money is and how it is created, we now turn to its more international aspects.

2.2 The International Payment Mechanism

In this section, we explain how transactions involving the exchange of foreign currency are made, while discussing the effects these transactions have on the money supply.

2.2.1 Some Basic Principles

Recall that money mainly changes hands (or bank accounts) when one is buying or selling goods, services, or assets. A special problem arises if the buyer and seller live in countries that have different currencies: then at least one of the parties has to handle a foreign currency. As long as currencies are defined by their weight in gold or silver and are freely minted, this creates no special problem. An ounce of gold is an ounce of gold everywhere, and currencies minted in various countries freely circulated elsewhere, traded approximately on the basis of their intrinsic value (see the story of the guinea in panel 2.1). So, basically, any trade imbalance was settled in gold or silver (which were themselves also physical goods), and this happened by physically transporting the coins.

Today, things are not that easy. If the invoice is in the exporter's currency, the importer often has to buy the currency of the exporter, or the exporter can agree to be paid in foreign currency, and then exchange the foreign money for domestic currency herself. If payment is in bank notes, the notes can still simply be handed over, but most international payments are by check or bank transfer. The following example shows how such payments take place.

Example 2.3. Assume that a U.S. importer, USM, pays by check in his own currency, USD 1m, to a U.K. exporter, UKX. Writing the check, of course, means that the U.S. importer has a checking account with a U.S. bank (USB). By definition, money on that account is convertible into dollar notes and coins. One possible scenario is that the U.K. exporter also has a checking account with a U.S. bank. We shall assume that this is the same bank as the U.S. importer's bank, USB. (If this is not the case, think of USB as the consolidation of all U.S. banks.) UKX deposits the check into her account with USB, and can cash in that amount at any time. Clearly, the U.S. money supply is not affected; there is only a transfer of ownership of electronic money from the U.S. importer to the U.K. exporter.

In the modified example below, we see what happens if the U.K. exporter does not have an

account in the United States, but, as in the previous example, still decides not to sell the USD yet.

Example 2.4. The U.K. exporter deposits the check into a USD checking account he or she holds with the London bank. The U.K. bank, UKB, records in its books that it owes the exporter USD 1m (a liability), and that it has received a check. UKB will then deposit the check into its account with USB, because this is where the money can be cashed in; thus, the UKB's asset now is a USD 1m claim on USB. The difference from the previous example is that, after this transaction, the U.K. exporter has a USD claim not on a U.S. bank, but on a U.K. bank, which, in turn, holds a claim on a U.S. bank. The U.K. bank acts as a front between the owner of the funds (UKX) and the bank where the money is ultimately held (USB).

The fact that the U.K. exporter now has a USD claim not on a U.S. bank but on a U.K. bank (which, in turn, holds a claim on a U.S. bank) makes a difference. The London bank is not a U.S. bank: that is, it has no USD reserves deposited with the U.S. central bank (the Federal Reserve), nor can it call on the Federal Reserve as a lender of last resort. This U.K. bank will, understandably, not give the exporter the right to convert the USD deposit into USD notes and coins at sight (that is, without prior notice and without costs). In that sense, the London USD checking account is not a sight account in the strict sense. If the exporter asks for dollar notes, the London bank could possibly cash in USD 1m from its U.S. account and have the notes flown over, which would be expensive, or the London bank could buy USD dollar notes from somebody else in the United Kingdom, if that is cheaper. The implication is that USD held on a *non-U.S.* bank account will generally have a different price (or exchange rate) than USD notes, as you probably noticed from your bank's posted exchange rates or from your newspaper.

There is also seignorage associated with having a currency that is used internationally. Recall how local merchants, when paying with promissory notes that were not immediately cashed in, effectively obtained interest-free loans. The same still happens internationally: a small country, whose currency is not used anywhere else, has to pay for its imports by exporting goods, or by selling assets.[9] In contrast, a large country like the United States, which has a widely accepted currency, can pay in its own money and still expect that this money will remain in circulation among international traders for many years before it is cashed in for goods or for assets. This becomes an interest-free loan, with an unstated time to maturity, from the rest of the world to the United States.

Table 2.3. Netting: and example.

		To A	To B	To C	Gross out (row sum)	Net out
From	A	—	40	15	55	10
	B	30	—	60	90	15
	C	15	35	—	50	—
Gross in (column sum)		45	75	75	195	
Net in		—	—	25		25

2.2.2 Domestic Interbank Transfers: Real-Time Gross Settlement versus Periodic Netting

If you want to transfer money to another business electronically, you move money from your bank account to the other's bank account. Cash payments remain possible but are becoming quite rare, except for small (or illegal) transactions. True, if you buy and sell a lot to each other all the time, you and the other firm may open a mutual *current account*. This functions like a booklet where you jot down all transactions that increase or decrease your net debt to the other party. But entries into such a current account are not payments. Rather, they help you keep track of how much the actual net payment will be at the moment you really make the transfer (in cash, or via a bank account) at end of the day, or week, or month, or quarter.

In the same vein, commercial banks ("depository institutions") within one country typically transfer money to each other via their central bank rather than in cash. All banks have an account with their central bank,[10] showing how much money they can withdraw in cash if they would want to. So to make a payment, the sending bank S instructs the central bank to transfer money from S's account into the account of the receiving bank, R. Banks may do some netting via a bilateral or multilateral netting system, but the final net payment is via their accounts with the central bank.

Traditionally, banks did set up a netting/clearing system among each other—often, but not always, in cooperation with the central bank—and then made or received the net payments once a day. This daily settlement typically happens toward the end of the working day. Let us consider a simple example, which looks at the wire transfers between banks.[11] Table 2.3 shows a simple example with three banks; the matrix shows how much bank X (= {A, B, C}) has to transfer to bank Y because of payment instructions from its customers. The row sums tell us, for each bank, the total amount of outgoing payment instructions, while the column sums provide us with the incoming ones. The difference of the "total out" and the "total in" gives us the "net out" (if positive) or the "net in" (if negative). By netting the payments, the volume of transfers is substantially reduced, from 195 to 25 in this example. This allows banks to work with far smaller balances in their central bank account: you cannot make payments exceeding what is in your bank account, so each bank would have needed larger central bank balances if the gross payments had been due rather than the net ones.[12]

So far so good. But big players with big amounts due may want their money faster. Also, when they deposit a check or a bill into their account they do not like being credited tentatively ("with the usual reservation"), they appreciate *finality* of payments. For big amounts, since the mid 1990s central banks have usually offered a system where transfers are executed immediately rather than bottled up until the next daily settlement. And of course, if there is no waiting at all, then there cannot be any netting either. Hence the name *real-time gross settlement* (RTGS). Often, committees must have spent a lot of time finding a clever acronym, like CHAPS (United Kingdom), SPOT (Portugal), HERMES (Germany), ELLIPS (Belgium), IRIS (Ireland), DEBES (Denmark). The United States chose *Fedwire*. The European Central Bank has its TARGET supersystem, which links the RTGS programs of each EU central bank (whether an EMU member or not) provided the payment is in euros. Each of these systems typically provides the option of intraday borrowing, per hour. (Traditionally, lending or borrowing was per day, of course, given that payments were only done once a day.)

The above relates to interbank transfers within one country. These are just one step in a

transfer from company X to person Y, and the other steps can occur fairly independently of the interbank part. For instance, if you deposit a check into your bank account, the amount is usually credited "with the usual reservations," with same-day or first- or second-working-day value—long before your bank actually receives the payment from the writer's bank, that is.[13]

2.2.3 International Payments

Let us now consider international payments. One extra problem is that the sending and receiving banks, S and R*, are no longer members of the same clearing organization. (We use an asterisk to indicate "foreign.") The traditional solution is to work with *correspondent banks*. If banks S* and S have agreed to act as correspondents for each other, they have a current-account relationship, with a liability account called *loro* ("theirs") or *vostro* ("yours") and an asset account called *nostro* ("ours"). So S sends the payment instruction to S*, which then makes the payment to R* via the foreign central bank's clearing system. The current account is then settled quite rarely, say once a quarter or whenever the balance becomes too big. The main point of postponed settlement of the loro/nostro accounts is of course a kind of netting over time. The way the party with the surplus receives a genuine payment for the net remaining balance—since transfers via the central bank are not possible between S and S^*—is to spend the balance: simply buy securities or withdraw cash. Correspondent banking is slow and expensive, especially with payee-driven payments: a check has to be sent abroad, from S to S^*, and then to R^*, and each has to handle and record it, etc.

There are international wire (or bank-transfer) systems too. Europe's postal banks have set up *Eurogiro*, which delivers fifth-day value as the default option: the beneficiary can withdraw cash the fifth working day after the payment is initiated. Second-day value is available, at a price, as well as quasi-immediate value, via Western Union, a U.S. telephone/telegraph company that has been offering fast wiring services for ages. The most important player, however, is the Society of Worldwide Interbank Telecommunication (SWIFT). SWIFT was set up as a cooperative, after World War II, by JP Morgan, near Brussels (BE), and later transferred to a consortium of banks. SWIFT transmits messages between banks, well over ten million of them per day, for a small fee; any free cash flow remaining after SWIFT has paid its expenses is then paid out to the shareholding banks. Payments via SWIFT mean same-day value. Other services offered by SWIFT (and Eurogiro) include the option to have a local check printed out in the beneficiary's country, by SWIFT or Eurogiro; that check is then immediately delivered to the debtor's bank, thus avoiding mail float.

2.3 International ("Euro") Money and Bond Markets

In the previous section, we mentioned that one can deposit a USD check into a sight account with a bank located outside the United States. One can, however, also make a *time deposit* by depositing the USD with a U.K. bank for, say, three months. In return for interest income, the owner of these funds then transfers the right to use the money during that period to the U.K. bank. This is an example of a "eurodollar" transaction, in the sense that the dollar is deposited in Europe, outside the dollar's home turf.

In this textbook, money and capital markets are called *international* if the currency of denomination is not the official currency of the country where the transaction takes place. The traditional name for international markets, still frequently used, is euromarkets—euromoney and eurobond markets, for example—and especially eurodollars. This name made sense initially, since the only international markets in those days were those for dollars in Europe (including the United Kingdom). The terminology became more artificial when the term was applied not just to eurodollars but also to other currencies. Deutsche Marks deposited in Paris were then, somewhat confusingly, called euro-DMs. Things became quite problematic when the European Union coined its new common currency, the euro: a euro-deposit in London (outside Euroland) would then, bewilderingly, be called a euro-euro. There have been calls to use the prefix *xeno-* to indicate such extranational transactions, but this has not caught on. For this reason we use the term "international" where others might still use "euro-." Another candidate term might have been "offshore," but this word has a connotation of "exempt from domestic tax rules," like a ship in international waters—which is not what we have in mind here.

Example 2.5. A Norwegian investor may deposit USD with a bank located outside the United States, perhaps in Oslo or in London. This deposit is then considered an international deposit. (USD deposits with an *international banking facility*, a U.S. banking institution that is deemed to be outside the United States as far as banking regulations are concerned, are also considered to be not U.S.) In contrast, if the USD deposit is made in the United States, the transaction is a domestic deposit.

Such international markets have long antecedents. In many European trading centers, bankers have been accepting deposits and trading commercial paper denominated in many different currencies since the Middle Ages (see figure 2.4). The prefix euro- was first used for USD deposits and loans made in Paris and especially London after World War II when the USD replaced the GBP as the leading international currency. Later, such international markets also emerged for other currencies.

In Bruges, the main trading center in the Low Countries (Benelux) until the late 1400s, exchange transactions and discounting and trading of bills took place on a little square in front of two inns, Ter Beurse (picture) and De Oude Beurs, named after the innkeeper, Van der Beurze (beurs means purse)—hence the continental words börse, beurs, bourse, bolsa, borsa, and so on, for organized capital markets. Bruges's Beurs was rather informal by current standards, but it drew up a rulebook in 1309, including the opening and closing bell still found in the NYSE. The first truly organized exchange in the West, with fixed opening hours, rules, members, and such, was the Beurs of Antwerp in 1531; commercial paper and T-bills were traded in the afternoon while commodity forwards and options were traded in the morning. One of the Beurs's members was Lord Thomas Gresham—yes, the Gresham of good and bad money—who soon convinced Elizabeth I to build a similar bursa in London, 1565. (She later changed its name, by decree, into Royal Exchange. Do read Gresham's CV on Wikipedia, incidentally: the SEC would jail him, nowadays.) Rotterdam and Amsterdam followed in 1595 and 1613, respectively. Amsterdam's addition was the anonymous joint-stock company and the corporate bond (the Dutch United East India Company issued shares and bonds in 1603). (Author's photo.)

Figure 2.4. Bourse, börse, borsa, beurs, bolsa, exchange.

Banks accept deposits in order to relend them: international deposits must also be accompanied by international loans. The development of international money and loan markets was followed by the opening of markets for securities, the first of which was the international bond market. A more recent phenomenon is the international commercial paper market; an international equity market is also emerging. We shall discuss these markets in chapters 16–18.

There are many reasons why some investors preferred to make their USD deposits outside the United States, as well as why there was (and is) so much USD borrowing outside the United States. One of these reasons was that the international markets were less regulated than the United States market. There has been substantial deregulation everywhere, but for a long time the absence of reserve requirements, deposit insurance, transaction taxes, withholding taxes, etc., made international transactions cheaper than similar transactions in many domestic money markets. Also, it was comparatively easy to evade income taxes on income from international deposits, which further increased the attractiveness of this market. These factors have allowed the emergence of a market for large, wholesale deals, at interest spreads that are

narrower than the spreads that typically prevail in domestic markets. A detailed discussion of these and other explanations for the success of eurocurrency markets is provided in chapter 16.

One thing is certain, however: in order for many dollars to end up in the hands of non-U.S. companies and individuals, the United States must have had a long and persistent deficit on its current account. This brings us to the next topic, the balance of payments.

2.4 What Is the Balance of Payments?

In this section, we explain the balance of payments accounts and its subaccounts, along with the accounting convention used to record transactions in these accounts.

2.4.1 Definition and Principles Underlying the Balance of Payments

The balance of payments (BOP) account is a statistical record of the flow of all financial transactions between the residents of one country and the rest of the world over a given period of time (usually one year). Transactions are grouped in "source" and "use" tables. If you are familiar with basic accounting, you can think of each transaction being recorded twice, like under double-entry accounting: once as a source and once as a use.

- **Sources** get a *plus* sign (credit). The source side of a deal tells us where we obtained the money in the international transactions. We could have earned some (goods or services sold, or income from labor or capital or real estate), we could have sold assets, we may have borrowed, or (note this!) we could have depleted our bank account. Some money or assets might even have been brought along by immigrants.
- **Uses** get a *minus* sign (debit). The use side of a deal tells us what we did with the money. We may have bought goods or services; we could have paid foreign workers or investors or landlords; perhaps we purchased assets or lent money internationally, or gave it away as development aid; or (note again!) we may have added money to our bank account.

There is an account for each possible source and use. It is customary to group these accounts into the following groups and subgroups; do read the list shown in table 2.4 and the resulting BOP, table 2.5.[14] Most entries are pretty obvious—except perhaps for changes in financial items, and primarily so for liquidities, where it is very tempting to think of the entries in terms of corporate balance sheets rather than sources/uses. It is probably worth spelling out the likely source of confusion.

Note, indeed, from the definition, that the balance of payments, being mostly a record of the *flow* of payments over a period of time, does not describe the country's *stock* of foreign assets and liabilities; in that sense, it is not at all like a company's balance sheet. Rather, just like a corporation's sources-and-uses statement, the BOP analyzes and explains changes in consecutive assets-and-liabilities statements. Yet, when we see an entry like "CAD liquidities: +10m" or "securities: -5m" we are likely think of changes in balance-sheet items and we would therefore misinterpret the sign. BOP entries are nothing like balance-sheet items or changes therein. The above entries mean that, of all the money that we used in international

payments, 10m was obtained out of our bank accounts (source, +) and 5m was used (–) to buy securities. The signs for sources and uses are opposite to those of changes in the balance sheet.

Table 2.4. Classification of various international sources and uses of funds.

- **The current account** (or group of accounts, really):
  - — "merchandise": goods sold (+) or bought (−) internationally
  - — "services": services sold (+) or bought (−) internationally, including consulting, insurance, and so on
  - — "income":
    - * from labor: wages earned (+) or paid (−) internationally
    - * from capital: interest or dividends earned (+) or paid (−) internationally
  - —unilateral income transfers, inward (+) or outward (–): repatriated wages, etc.
- **The capital and financial account** (really, a group of accounts, again):
  - — "capital account": unilateral transfers like aid received (+) or granted (−), assets brought in or taken out by immigrants
  - — "financial account": tradable assets, or contractual assets or liabilities with similar effects as traded assets:
    - * private transactions:
      - – FDI: inward (+) or outward (−)
      - – securities sold (+) or bought (−) internationally
      - – derivatives sold (+) or bought (−) internationally
      - – loans received (+) or granted (−) internationally
      - – changes in liquidities
      - – other
    - * central-bank transactions (similar)
- **Statistical discrepancies**

Example 2.6. If countries had balance sheets like companies have, a decrease in the balance-sheet item "securities" would have meant a sale of assets (ΔAssets < 0), but this is a source of cash (+). Or, in another example, if a company uses 5m to buy securities, this purchase is booked as a use (−) for the "securities" line in a sources-and-uses table, but the corresponding balance-sheet position goes up, not down. Do not mix these things up.

Note also that the BOP is related to the exchange market, but far less than is sometimes claimed. Within Euroland, countries still make euro payments to each other, all of them recorded in the BOP, even if there is no exchange transaction. Or one Australian can exchange pounds for dollars with a fellow Australian; here, there is an exchange transaction but no international payment. Likewise, a Japanese company holding dollars can pay for imports from the United States without making an exchange transaction, even though there will be a double

entry into the BOP. There is only a very close link between the BOP and the exchange market under what one might call the late 1940s' scenario: every country has its own currency, and residents of country X only hold their own currency, never any foreign one.[15] In that setting, every international transfer is an exchange transaction too. But the emergence of international money accounts has considerably weakened the link between the balance of payments and the exchange market.

Table 2.5. The balance of payments: new definition.

(a) Sources	(b) Uses	Balance = (a) − (b)
1. Current transactions		
+ Exports of goods	− Imports of goods	= Merchandise balance
+ Exports of services	− Imports of services	= "Invisibles" balance
+ Factor income received	− Factor income paid	= Net factor
+ Labor	− Labor	income received
+ Capital	− Capital	
+ Unilateral, inc. transfers IN	− Unilateral, inc. transfers OUT	= Unilateral, inc. transfers balance
	Subtotal	= Current account balance =: CA
2. Capital and financial (C&F) transactions		
+ Unilateral asset transfers OUT	− Unilateral asset transfers IN	= Capital account (new definition!)
+ Private sales of assets	− Private purchases of assets	
+ Inward FDI	− Outward FDI	= Net private
+ Shares, bonds sold	− Shares, bonds bought	sales of assets
+ Derivatives sold	− Derivatives bought	(formerly =: KA)
+ Other assets sold	− Other assets bought	
+ Central bank's sales of assets	− Central bank's purchases of assets	= Net central bank asset sales =: −ΔRFX
	Subtotal	= C&F account balance =: KFA
3. Statistical discrepancy		
+ (Unrecorded inflows)[a]	− (Unrecorded outflows)[a]	= Net errors and omissions = E&O
Grand total		CA + KFA + E&O = 0

[a]Only net errors and omissions are observable.

A further implication of the BOP definition is that every "source" must be "used" somewhere, which means that every entry must have a counterpart. In other words, if you hear or read that a certain country has a balance-of-payments deficit, it must be referring to some subtotal in the BOP, some subgroup of accounts rather than the whole BOP account. Thus, when you hear about a deficit, you should always ask yourself to which subaccount of the BOP reference is being made. Old texts occasionally refer to a net excess credit booked by the central bank as "the surplus on the balance of payment." In books or the printed press, the term

"balance" may refer not to the sources-and-uses table as a whole, but to one of the net surpluses or deficits (that is, the result of credits minus debits) for a subgroup indicated in table 2.5. For example, one often uses the term *merchandise balance* or *trade balance* for net exports of goods, *invisibles balance* for net exports of services, and *current-account balance* for the sum of the above plus net inward income transfers. But hasty writers may very well say "BOP surplus" when they mean "trade surplus" or "current-account surplus." Newspapers and the like can be amazingly sloppy about this, contradicting themselves as if there were no tomorrow.

DIY Problem 2.1. A "training" question on www.fxcm.com (November 2006) was "What happens to the USD if the U.S. trade deficit widens due to Japanese sell off of U.S. treasuries?"

- Why is this gobbledygook? (Do be gentle.)
- What might they really have meant?
- What additional information would you need to answer the question?

In table 2.6 we show a few examples of how the omniscient statistician in the sky would record various transactions. We dissect each deal into its two legs (source, use) and indicate the account where each half belongs.

DIY Problem 2.2. Read the three examples worked out for you in table 2.6, then complete the three remaining ones.

2.4.2 Some Nitty-Gritty

There are a few technical details to be added.

Table 2.6. Six records in Canada's theoretical BOP.

	Transaction	Use (−) or source (+)	Credit	Debit
1.	StarDucks Canada, a Canadian firm, imports CAD 100m worth of coffee from Ghana AraCoff...	Current (−), (merchandise)		−100m
	...and pays for it by transferring CAD 100m from its account at CIBC (a Canadian bank) to AraCoff's account with the Bank of Nova Scotia	Financial (+), (CAD liquidities)	+100m	
2.	StarDucks uses the services of Accra Stevedoring, worth 10m...	Current (−), (services)		−10m
	...and pays for it by transferring USD 7.5m (CAD 10m, after translation) from its account at CIBC to Stevedoring's account with CIBC	Financial (+), (USD liquidities)	+10m	
3.	The University of Brunswick at Colomba (UBC) sells 15m worth of bonds to a London broker	Financial (+), (securities)		−15m
	...and receives CAD 15m into its account at Brunswick Bank, from the broker's account with Bank of Toronto	Financial (−), (CAD liquidities)	+15m	
4.	A professor at UBC tenders 10m shares in an acquired Canadian firm, valued at CAD 77m, to a U.S. acquirer...			
	...and receives 2m shares of the acquirer in return			
5.	StarDucks exports 1m worth of coffee mugs to the Dutch Antilles...			
	...in return for a trade bill accepted by the customer, payable 90 days			
6.	A customer of StarDucks, however, pays the CAD 1m 75 days early...			
	...and StarDucks sends back the trade bill			

Accruals versus cash accounting. The examples work on what accountants would define as an accruals basis: exports or imports are recorded when the invoice is sent, not when the payment is being done. In practice, the BOP is put together by the central bank, which uses information from commercial banks on actual payments. Thus, a real-world BOP would not show transaction 5 (StarDucks exporting mugs, payment 90 days), as the central bank would not be aware of that contract; instead, records 5 and 6 would show up in a merged version (exports +1m, liquidities −1m) when the payment occurs.

Economically, however, showing record 5 would have made sense. By comparing customs data with central-bank data one can get an impression of the size of the change in internationally outstanding accounts receivable (A/Rs) or accounts payable (A/Ps).

CIF versus FOB. Imports are usually booked at a value *cost, insurance, freights* (CIF), so in reality they include an "invisibles" or service component. Exports, in contrast, are usually valued *free on board* (FOB), not including freight and insurance. This is one reason for not focusing on the merchandise balance on its own. The current account makes much more sense as it contains the sum of goods and services trade; misclassifications *à la* CIF/FOB do not matter if we look at the total, and even apart from this there is no good reason why the

merchandise subtotal would be intrinsically more crucial than the invisibles one.

FDI versus portfolio investments. If shares in an existing firm are bought, it is deemed to be *direct investment* if the investor acquires a controlling share or at least participates in the management of the firm. *Portfolio investment*, on the other hand, refers to a transaction in which securities are held purely as a financial investment. For clerks in statistical offices it is often difficult to distinguish between direct investment and portfolio investment and, typically, the classification is made on the basis of the proportion of the firm held by the investor. The cutoff level of ownership beyond which an investment is classified as direct investment varies between countries but is usually around 10%.

Foreigners versus nonresidents. We talked about international transactions without stating precisely what was meant by this. They could be defined by using a nationality criterion: any deal between a national and a foreigner would be recorded even if no goods or assets cross borders (because the foreigner lives here, or the national lives abroad). Alternatively, the criterion could be on the basis of residence not nationality. The choice is linked to how one views the other national accounts: does gross product refer to all value added by residents (gross domestic product) or by nationals (gross national product)?

Old versus new definitions. The definitions we used were implemented as of the second half of the 1990s, but if you check older books or statistics, these are likely to use different meanings. First, all unilateral transfers used to be part of the current account; now, unilateral capital transfers (such as assets brought by immigrants, or development-aid grants, or debt forgiven) have been moved into the capital account, which is a subtotal of the capital and financial account. For generous countries like Norway, moving development aid—a use, therefore a minus—out of the current account has a big positive impact on the current-account balance, but it does not reflect any real change: there is an offsetting hole in the financial account. Second, central bank deals used to be reported separately, rather than alongside the non-central-bank players (which coincides mostly with the private sector). Third, in the old terminology one said "capital account" for what is now called the non-central-bank part of the "financial account"; do not get confused. Lastly (and most trivially), one now uses "statistical discrepancies" for what used to be called, too honestly perhaps, "net errors and omissions." We have not yet discussed this one, so here goes.

2.4.3 Statistical Discrepancy: Errors and Omissions

The last item in the BOP is the statistical discrepancy. Since any sources-and-uses statement must balance by definition, the foreign exchange transactions in the current account and those in the capital account should sum to zero. That is,

$$\mathrm{CA} + \mathrm{KFA} = 0. \tag{2.2}$$

This says that if you spent more than you earned (CA < 0), then you must either have borrowed or sold some of the family silver (KFA > 0). (Remind yourself how selling assets means a +.) In practice, there is a problem with measuring all transactions accurately. KFA contains the change in the reserves, and it is reasonable to assume that, in most countries, there is little

error in that item. However, the measurement of the other items can be quite difficult and errors can occur easily. Commercial banks do not ask for details when the amounts involved in international payments are small; as a result, the central bank has to guess what the small deals were used for, or just book them as "unknown." It is also a safe bet that at least some of the reported deals misstate the purpose, for instance for tax reasons. And, of course, there is no foolproof way to detect international payments in cash. Nor can the central bank double-check its export and import data with the customs data. One reason is that the timing of recognition differs, with the bank using a cash basis and customs an accruals basis; and also, of course, customs do not know everything correctly. It is generally believed that the errors on the KFA are larger than those on the CA.

Thus, in terms of statistically recorded transactions, equation (2.2) generally does not hold as an equality. So when we work with estimated CA and KFA numbers—indicated, below, by the hat over the symbols—the item errors and omissions (E&O) must be added to the left-hand side to get an equality relationship:

$$\widehat{\text{CA}} + \widehat{\text{KFA}} + \text{E\&O} = 0. \tag{2.3}$$

The E&O term can be surprisingly large, sometimes of the same magnitude as the $\widehat{\text{CA}}$ and $\widehat{\text{KFA}}$. Thus, one needs to be very careful when reading these accounts and very cautious in interpreting the data from the BOP.

Throughout the rest of our discussion of the BOP, we shall think in terms of the more relevant true (hatless) exports of goods, services, and assets rather than the recorded (hatted) figures; thus, equation (2.2) holds as an equality by definition of "true" numbers. In the next section, equation (2.2) is used to analyze the relationship between a country's fiscal policy and its BOP accounts.

2.4.4 Where Do Current Account Surpluses or Deficits Come From?

A deficit on the CA means that the country as a whole is spending more abroad (buying goods and services, or giving money away) than it is earning from abroad. By looking at the rest of the national accounts we can see who is responsible and to what extent for the overall deficit, the private sector or the government. There is a direct link between the CA and the private-sector and government surplus or deficit. The equation, to be derived below, is as follows:

$$\text{CA} = \underbrace{[S_\text{p} - I_\text{p}]}_{\text{Private surplus}} + \underbrace{[\text{Tx} - C_\text{g} - I_\text{g}]}_{\text{G's surplus}}, \tag{2.4}$$

where S_p is private-sector savings, I_p is private-sector real investments, Tx is the government's tax revenue, C_g is government consumption (spending other than investment), and I_g is the government's real investments.

The first bracketed term is the private-sector free cash flow, savings minus real investment. The second one is the surplus on the government budget: tax income minus government spending.[16] Thus, if both the private sector and the government have a surplus, the country as a whole is in surplus, meaning that the current account must be in surplus too—and vice versa.

Example 2.7. In Japan, where since the mid 1990s the government has been running big deficits, the CA remained positive because the private-sector surplus was so huge.[17]

Example 2.8. Q. Suppose you were Groucho Marx, the President of Freedonia, and you lowered taxes while increasing government spending, in a country going through an investment boom but with virtually no savings. What would be your prediction regarding the current account?

A. You predict overspending for both the private sector and the government. The aggregate overspending will show up in a current-account deficit which must be financed by a capital-account surplus. Thus, Freedonia must borrow (e.g., sell bonds to foreigners), or dispose of shares in domestic or foreign companies, or sell other assets (like its famous Stonefeller Center, its renowned NGN Studios, or its beloved Kreissler Corporation).

For the intellectually ambitious reader, here is the story behind equation (2.4). One macro accounting relation looks at total availability of goods (and services, but let's keep it short) and their destination. Goods are made available by local production (with final net output Y) or imports (M). What is available can be consumed (C), or invested in machinery or research (I), or exported (X). Where appropriate we add a subscript "p" (for private) or "g" (government). Thus,

$$\underbrace{Y}_{\text{Output}} = \underbrace{C_p + C_g + I_p + I_g}_{\text{(Local) "absorption"}} + \underbrace{X - M}_{\text{Net } X}. \tag{2.5}$$

This equation focuses on the goods side of production and tells us where the goods that were produced or imported ended up: in the consumers' stomachs, or as machines in the factories, or abroad. But selling goods also generates income or, more precisely, value added. Thus, the next equation dissects the income side into various destinations: private-sector income can be spent in private consumption, or saved (S_p), or surrendered to the tax man (Tx), or transferred to foreigners as interest or dividends or wages or repatriation of income (Tr):

$$Y = C_p + S_p + \text{Tr} + \text{Tx}. \tag{2.6}$$

Combining both equations we get

$$C_g + I_p + I_g + X - M \overset{(2.5)}{=} Y - C_p \overset{(2.6)}{=} S_p + \text{Tr} + \text{Tx} \tag{2.7}$$

or

$$\left.\begin{aligned} X - M - \text{Tr} &= [S_p - I_p] + [\text{Tx} - C_g - I_g], \\ \Rightarrow \quad \text{CA} &= [S_p - I_p] + [\text{Tx} - C_g - I_g], \end{aligned}\right\} \tag{2.8}$$

which finishes the proof.

2.4.5 The Net International Investment Account

As described above, the BOP is an account that keeps track of the flow of foreign exchange into and out of the country. To measure the result of these cumulative inflows and outflows, we have the *net international investment* (NII) account, or the *net external assets* account. The NII account tries to measure the net ownership of foreign assets. That is, the NII account is

designed to measure a country's stock of international assets and liabilities—somewhat like a company's statement of assets and liabilities, except that the NII account omits domestic assets owned by residents.

Example 2.9. Here we compare the BOP and the NII account. Suppose that you keep two accounts. The first account keeps track of your income and expenditures during the year. This account informs you about the inflow (sources) and outflow (uses) of funds each year and is analogous to a nation's BOP account. The second account shows you how much money you have accumulated at the bank and (assuming you have no other assets) your net asset position. In itself, this account represents your solvency at a given point in time. This second account is analogous to the NII account. The NII account is what we should look at in order to judge the ability of a country to meet its international debts without having to sell locally owned domestic assets. Thus, while the BOP tells us whether a country's asset portfolio is getting better or worse, the NII account tells us how good or how bad things actually are, in an absolute, cumulative sense, at a given point in time.

We now consider an example at the level of a country, rather than an individual.

Example 2.10. We must look at stock versus flow information from the BOP and the NII account. Suppose that a country has been running a current-account deficit of USD 20 billion for each of the last three years, but its NII account has a positive balance of USD 1,000 billion. Then, even though the current-account balance in the BOP accounts reflects a deficit, given the large positive balance in the NII account, this current-account deficit is not a problem—at least, not at this time.

There is obviously a link between the BOP and the NII account; increases in the amount of foreign assets owned add to the NII account. That is, the combined balance on the current and capital accounts leads to a change in the net asset position of the country. This change is reflected in the NII account. Recall, however, that transactions in the current account and capital account are not recorded perfectly. For example, unrepatriated earnings are not recorded in the current account, nor are changes in the market values of foreign assets (arising from either a change in the local value of these assets or a change in the exchange rate). Thus, the true NII account may change in a way not fully explained by the official BOP statistics.

Example 2.11. There may be large differences between the estimated net asset position of a country and the NII account computed from the BOP. In 1992, the NII account balance for the United Kingdom was reported as GBP 60 billion. However, the true mid-1992 net asset figure was estimated by one source as somewhere between GBP 80 and 100 billion.

A CA deficit and a deterioration in the NII account balance are traditionally viewed as bad news for the country and its currency, so they may lead to government action. This is especially true if the government wants to maintain a constant exchange rate and feels that it is threatened by a deficit.

Example 2.12. Q. Go back to Groucho Marx's Freedonian CA deficit. What would be your prediction regarding the NII account and the strength of the Freedonian crown (FDK)?

A. If the CA deficit goes on, Freedonia's NII account, which was hugely positive in the 1960s, will go into the red (i.e., the country's foreign-held debts exceed its foreign assets). Foreigners may be very happy to buy the Freedonian assets if there is a stock-market bubble going on, but absent this they will be prepared to buy more and more Freedonian assets only if the price falls. A drop in the value of the FDK is one way to achieve this.

This brings us to the last topic of this chapter: exchange-rate regimes.

2.5 Exchange-Rate Regimes

We have seen how money is created and how it is transferred from one owner to another owner

in a different country. In the examples we considered, money was transferred as a payment for goods, but very often this entails an exchange transaction: the importer buys the exporter's currency and pays, or the importer pays in her own currency but the exporter then converts this money into her own money. Exchange transactions are, per definition, also needed when somebody wants to shift investments from one currency to another. The price that one pays for one unit of the foreign currency, in such a transaction, is the exchange rate. This rate depends on the supply and demand for the foreign currency. Very often governments instruct their central banks to influence the supply and demand for a currency.

Government intervention in the exchange markets occurs through the buying and selling of foreign currency by a country's central bank. In section 2.1.2.5 we noted that such intervention affects the country's monetary base and, hence, its money supply. Yet influencing the money supply is usually not the primary purpose of intervention in the foreign exchange market. Instead, the main purpose of intervention is to control or at least influence the exchange rate. Thus, the central bank buys foreign exchange when the exchange rate (the market price of foreign currency) is too low, and it sells foreign exchange when the exchange rate is too high. Many central banks intervene on the basis of policy objectives and rules formulated by the government. Loosely, a country's exchange-rate regime can be defined as the set of rules that its central bank follows when buying and selling in the interbank market. These rules can vary greatly. We shall discuss them briefly in reviewing postwar international monetary history.

2.5.1 Fixed Exchange Rates Relative to Gold

Before World War I, most countries had an official gold parity; that is, they fixed the price of gold in terms of their own currency. (This, in fact, refers to the old principle that gold was the true currency.) After World War II, only the USD had a fixed gold parity, officially USD 35 per troy ounce of fine gold with intervention points at 34.8 and 35.2.

"You shall not crucify mankind upon a cross of gold," was how the 1896 U.S. Democratic presidential candidate, William Jennings Bryan, famously expressed his sentiments about the gold standard (www.tntech.edu/history/crosgold.html). As the dollar was convertible into gold, the ratio of outstanding dollars to gold reserves needed to remain credible in order to prevent runs on the gold stock. For example, an individual feels confident that he or she will be able to effectively exchange USD notes into gold when the number of USD notes exceeds their gold backing by only 2 to 1. If, however, the number of dollars exceeds their gold backing by 100 to 1, it is obvious that if, in a period of uncertainty, a small fraction of USD notes is converted into gold, then the remaining USD notes will have no gold backing left. If the USD-to-gold ratio is high, the slightest scare is sufficient to send people flying to the bank, trying to be ahead of the others. Such a stampede then achieves the very event the investors are afraid of: the bank runs out of gold. Thus, to avert panic, the U.S. central bank (the Federal Reserve) has to make sure that the money stock does not grow faster than the stock of gold. However, there is also a limit to the value of transactions that can take place in, for example, one month, with a given amount of dollars in circulation. For this reason, a limit on the stock of dollars also imposes a limit on the value of transactions made in dollars; maintaining a credible gold backing ultimately creates the risk of slowing down economic activity in the United States and international trade, two domains where USD are used as the medium of exchange. The

necessity of choosing between economic growth and credibility is often called the *Triffin Dilemma*, after the professor at Yale University who again pointed out the problem in the early 1960s.

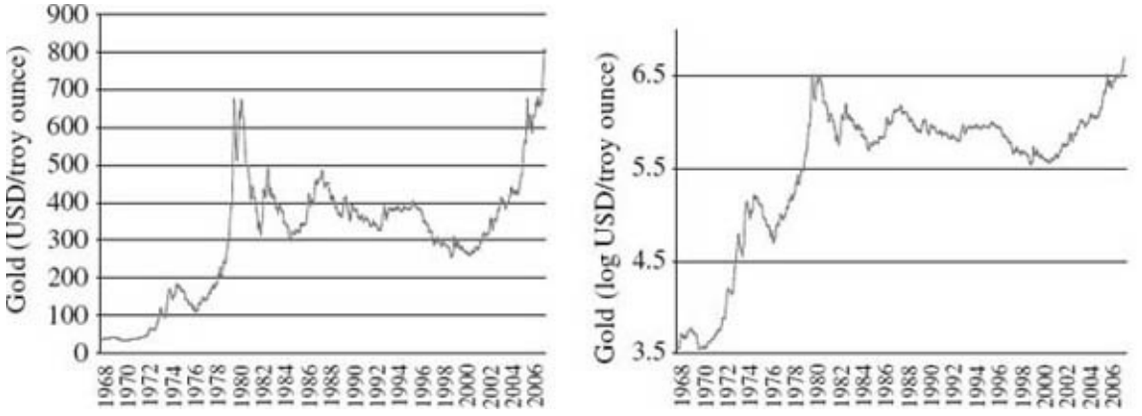

Figure 2.5. The gold price, 1968–2007. The plot shows the monthly average of the daily fixings in the London market ("free" market, during Bretton Woods: the "official" market, open only to central banks, had a fixed price till 1973). I first plot the price and then the log price, which helps you see where the rates of return (as opposed to absolute price rises) were the biggest. Thus, percentage-wise the rise 1977–80 was much more pronounced than the 1998–2007 hike. The 1980 peak was also spectacular in the sense that if corrected for general (CPI) inflation, it amounts to about USD 1,000, a price level that reappeared only in 2008. (*Source:* Underlying data are from DataStream.)

The United States did not restrict the supply of dollars after World War II. Internally, this was no problem, because U.S. residents were no longer allowed to convert dollars (or any other currency) into gold. Externally, there was a problem, though: the Vietnam War and the Great Society Program created a government deficit, leading to a CA shortfall, financed by large-scale transfers of dollars to foreigners. Unlike U.S. residents, these non-U.S. investors and central banks *could* always buy or sell gold (at USD 35) in the London gold pool, where the Federal Reserve stabilized the USD gold price by using the pooled gold stocks of the central banks of most Western nations. Decreased credibility led to minor runs on gold, which further decreased credibility, which led to more runs on the gold stock. The U.S. Federal Reserve, which had held about two thirds of the world's gold stock in the late 1940s, soon saw its reserves dwindle. In the mid 1960s, the official gold market had to be closed to all private investors, while central banks were expected to avoid buying gold from the Federal Reserve. (France, notably, did not oblige.) In 1971, the official gold price was raised from USD/oz. 35 to 38, but that did not avert the ultimate collapse of the system. In 1972, the U.S. government gave up all pretense that the USD was convertible into gold at a fixed rate. The gold price soared, and has mostly been in the range of USD 300–600 ever since (figure 2.5). In the most recent decade (1998–2007), the low was about USD 250 (mid 1999), the high at the end (800+), part of a general commodities boom that is commonly ascribed to China's demand—even though I think hedge funds helped too. In early 2008, the price went over the USD 1,000 mark.

Besides the Triffin Dilemma, the gold standard suffered from the fact that gold has industrial uses and is expensive to mine. From that perspective, the use of gold as the basis for a financial system is a waste of scarce resources. Finally, some politicians objected to allowing major—but politically incorrect—gold producers like South Africa and the USSR cheap

access to USD, while others resented the crucial role and seignorage gains this system granted to the United States.

2.5.2 Fixed Exchange Rates vis-à-vis a Single Currency

Under a fixed exchange-rate regime, the government wants to guarantee a virtually constant price for a particular foreign currency, and instructs the central bank to buy or sell as soon as the exchange rate deviates by *x%* from that constant rate. The target exchange rate is called the country's *official parity*.

This system was strongly recommended under the Bretton Woods Agreement, signed in 1945 by the major Western nations. For instance, between 1949 and 1967, the United Kingdom set the central parity with respect to the USD at USD/GBP 2.8, and instructed the Bank of England (BoE) to intervene whenever the pound's value rose to 2.821 or dropped to 2.779. Thus, the intervention points were set by the government at 0.75% on each side of the official parity. As long as the BoE did not run out of USD, it would sell USD when the dollar became too expensive. If the dollar became too cheap, the BoE would buy. Likewise, Germany set the central parity at DEM/USD 4, and the Bundesbank would always make sure that the USD stayed in the range DEM/USD 3.97–4.03.

Note that the United States did not declare an official parity with respect to any other currency; the Federal Reserve was never under any obligation to intervene in the exchange markets. Note also that there was no official parity (and hence no intervention) for non-USD rates either, for example DEM/GBP. There are, of course, implicit, indirect bounds on what the DEM/GBP rate can be: if there are limits on how expensive the USD can be in terms of DEM, and limits on how expensive GBP can be in terms of USD, there is obviously an implied limit on how expensive or cheap GBP can become in terms of DEM.

Fixed exchange rates work satisfactorily only as long as the countries maintain their competitiveness, but this requires similar economic policies. To see this, note that the United Kingdom could not possibly have 100% inflation and still maintain the exchange rate if its trading partners have near-zero inflation: with a stable exchange rate, the U.K.'s exporters would have to quit foreign markets, and British firms selling in the United Kingdom would likewise be wiped out by foreign producers. In short, fixed rates require similar inflation rates across countries, which, in turn, requires coordination of economic policy. There was very little policy coordination in the period following World War II, however, and this ultimately led to the demise of the fixed-rate system. As of the early 1960s, the comparatively high inflation rate in the United Kingdom meant that GBP became manifestly overvalued (U.K. producers could no longer compete at USD/GBP 2.8), while DEM was undervalued (German producers could undercut anyone anywhere, at DEM/USD 4). Also, international trade and exchange, heavily restricted immediately after the war, were gradually liberalized. With everyone free to buy and sell foreign exchange, and with a rapidly growing volume of international transactions, the BoE had to buy more and more GBP (that is, sell USD) if it wanted to support the value of GBP. Likewise, the Bundesbank had to buy more and more USD to support the price of the USD and to keep down the price of DEM. As a result, the BoE frequently ran out of USD while supporting GBP, and the Bundesbank accumulated too many

USD.

Often, the Bundesbank lent USD to the BoE (under a swap arrangement; for more details, see chapter 7), or the United Kingdom borrowed USD from the International Monetary Fund, but these were only meant to be solutions to temporary problems. The idea, under the Bretton Woods Agreement, was that *structural misalignments* should be corrected by changes in the official parities (re- or devaluations). But this did not work very well. For one thing, the difference between a structural problem and a temporary problem was never defined. Moreover, devaluations were perceived by politicians as a sign of defeat, while revaluations were also unpopular because they hurt exporters. Nor did the IMF have the supranational power to impose parity adjustments on member countries. The result was that parity adjustments were postponed too long. As we have argued in the preceding section, the USD/gold parity had also become unrealistic by that time. The combined effect of disequilibrium exchange rates and gold prices led to the collapse of the system of fixed parities in 1972. Since that year, the currencies of the major OECD countries have floated with respect to the USD.

Some countries still maintain fixed exchange rates, with narrowish intervention bands, relative to one currency. A supposedly foolproof way of guaranteeing such a fixed rate is having a *currency board* instead of a central bank. The roots of this system were in the colonial period, where a local institution issued a local currency but was not allowed to pursue an active monetary policy; rather, it just exchanged, say, Belgian francs into Congolese francs or vice versa, one to one, and issued no extra Congolese francs via any other means (figure 2.6). In a modern currency board, the idea is similarly that (i) the board can issue local currency only if agents freely want to obtain it in exchange for hard currency, and (ii) the board has to take back local currency in exchange for hard currency if investors prefer so. From rule (i), all local currency should be fully backed by hard currency, so rule (ii) should pose no problems. Monetary policy is to be passive, just determined by the economy's demands—a libertarian's wet dream. It should also be fully immune to speculative attacks.

Figure 2.6. A bank note printed by a colonial currency board. The colonial central bank for the Congo, Rwanda, and Urundi (now Burundi) used to exchange local francs for Belgian francs and vice versa. After independence (mid 1960), Congo's currency board (*conseil monétaire*) initially just printed a reference to the Republic of the Congo on the old colonial notes. The Dutch at the bottom means "one thousand francs payable at sight" ("duizend frank betaalbaar op zicht") and "the counterfeiter is punished by forced labor" ("de namaker wordt met strafdienst gestraft").

In reality, the above predictions can be confounded. Argentina set up a currency board regime in 1991 (choosing, perhaps ominously, April 1 as the starting date), under which the Argentine peso was pegged one for one to the U.S. dollar. On January 6, 2002, the system collapsed ignominiously. How was this possible? First, in modern practice the 100% coverage only relates to M_0: the currency board only deals with commercial banks, not with the general public, and lets M_0 wax and wane if and when the commercials banks demand more or less local currency. But the commercial banks themselves can (and do) create far more money on their own, and this extra is not fully backed by foreign exchange (forex) reserves. So, speculative attacks are still possible, with investors starting a run on their banks to convert their electronic pesos into cash pesos (and those, hopefully, into dollars), a demand that commercial banks cannot possibly meet. In the end, Argentina's government froze all peso deposits. Second, a credible board should make risk-free hard-currency investments only, which rules out government financing. Nor should the board act as lender of last resort or overseer of the commercial banks: that would conflict with its supposed fully passive monetary stance. But Argentina's board did act as lender of last resort during the Mexican crisis (1995), and was allowed (and expected) to invest in government bonds rather than just hard currency. So, even M_0 was not fully covered, with the backing occasionally falling as low as 83%. Third, even if the board had been able to defend the exchange rate, ultimately the decision to maintain or cancel the system still remained a political issue. The rate can turn out to be less attractive than politicians first thought. For instance, after Argentina's huge neighbor and competitor, Brazil, devalued massively in 1999 and the USD had risen against the yen and the European currencies, the peso had a much harder time, and politicians had second thoughts about the one-to-one fixed rate. Also, when the speculative attacks came, interest rates rose to 40–60% as investors dumped peso commercial paper and bonds. This was very costly to the government, which was running huge deficits. So, in the end, the politicians pulled the plug.

Table 2.7. Exchange-rate regimes and anchors of monetary policy, 2004.

No separate currency as legal tender (40)	
Another country's money is legal tender	Ecuador, El Salvador, Kiribati, Marshall Island, Micronesia, Palau, Panama, San Marino
East Caribbean currency union	Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines
West African Economic and Monetary Union	Benin, Burkina Faso, Ivory Coast, Guinea-Bissau, Mali, Niger, Senegal, Togo
Central African Economic and Monetary Community	Cameroon, Central African Republic, Chad, Republic of the Congo (Brazzaville), Equatorial Guinea, Gabon
Euro area	Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain
Currency board arrangements (7)	
Argentina, Bosnia-Herzegovina, Brunei, Hong Kong (People's Republic of China), Djibouti, Estonia, Lithuania	

Other fixed peg or de facto fixed (40)	
Against single currency (30)	Aruba, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Bhutan, Cape Verde, People's Republic of China (mainland), Comoros, Iran, Jordan, Lebanon, Lesotho, Macedonia (FYR), Malaysia, Maldives, Namibia, Nepal, Netherlands Antilles, Oman, Qatar, Saudi Arabia, Sudan, Suriname, Swaziland, Syria, Turkmenistan, United Arab Emirates, Zimbabwe
Against basket (10)	Botswana, Fiji, Kuwait, Latvia, Libya, Malta, Morocco, Samoa, Seychelles, Vanuatu
Pegged with band (5)	
ERM II (1)	Denmark
Other (4)	Cyprus, Egypt, Hungary, Tonga
Crawling peg (4)	
Bolivia, Costa Rica, Nicaragua, Solomon Islands	
Crawling peg with band (6)	
Belarus, Honduras, Israel, Romania, Uruguay, Venezuela	
Managed float (40)	
Monetary aggregate target (11)	Ghana, Guinea, Guyana, Indonesia, Jamaica, Mauritius, Mongolia, Sao Tome and Principe, Slovenia, Sri Lanka, Tunisia
Inflation target (1)	Thailand
Monetary program (19)	Azerbaijan, Cambodia, Croatia, Ethiopia, Iraq, Kazakhstan, Kenya, Kyrgyzstan, Laos, Mauritania, Nigeria, Pakistan, Russia, Rwanda, Trinidad and Tobago, Ukraine, Vietnam, Yugoslavia, Zambia
Other (12)	Algeria, Angola, Burundi, Dominican Republic, Eritrea, Guatemala, India, Union of Myanmar, Paraguay, Singapore, Slovakia, Uzbekistan
Independent float (41)	
Monetary aggregate target (7)	Gambia, Malawi, Peru, the Philippines, Sierra Leone, Turkey, Yemen
Inflation target (15)	Australia, Brazil, Canada, Chile, Colombia, Czech Republic, Iceland, Korea, Mexico, New Zealand, Norway, Poland, South Africa, Sweden, United Kingdom
Monetary program (10)	Albania, Armenia, Congo (Democratic Republic), Georgia, Madagascar, Moldova, Mozambique, Tajikistan, Tanzania, Uganda
Other (8)	Afghanistan, Haiti, Japan, Liberia, Papua New Guinea, Somalia, Switzerland, United States

From the IMF (www.imf.org/external/np/mfd/er/2003/eng/0603.htm). Note the date, June 2003. Since then, most notably, the yuan became a floater and Euroland expanded to encompass Slovenia (2007) and Cyprus and Malta (2008). Slovakia joins in 2009.

This does not mean a currency board cannot work: the Baltic states' experience with the system was much more positive, for instance, and so is Hong Kong's. But you should remember that even this safe-looking regime requires a responsible fiscal policy, and needs a

bit of luck—no bad external shocks, notably.

In table 2.7 we see that, in December 2003, eight countries had a currency board. The table shows that, apart from the eight currency-board cases, thirty countries went for a traditional fixed-rate regime vis-à-vis one currency, and five had a fixed-rate-with-band regime. In addition, fourteen countries use a CFA (Communauté Financière Africaine) franc, which is basically fixed vis-à-vis the euro.[18] All in all, this means that sixty-nine countries still have fixed rates. The major OECD countries, however, have adopted different exchange-rate regimes. In the following sections, we discuss fixed rates as they relate to a basket, multilateral intervention points (notably, the European Union's Exchange Rate Mechanism), and dirty floating.

2.5.3 Fixed Exchange Rates Relative to a Basket

After 1973–74, some countries unilaterally defined a target parity for a portfolio or basket of currencies with intervention points around that target. Table 2.7 mentions ten countries that have pegged their currencies to a basket. One such basket is the SDR (panel 2.2). At one time, Sweden, Norway, and Finland pegged their currencies to another existing basket, the ECU, which is described in section 2.5.4. Some countries go for a basket of their own rather than taking an existing combination like the SDR. At one time, this group contained Australia, Sweden, Norway, and Finland. Before explaining how a basket regime works, we must consider how a basket is constructed.

Example 2.13. Suppose that since the election of President Groucho Marx the composition of Freedonia's trade has been fairly stable: about 60% of trade is with Euroland and 40% with the United States. Thus, Freedonia can create a basket with these approximate weights for, respectively, the EUR and the USD, and tie its crown (the FDK) to that basket. Suppose the rates are currently FDK/EUR 3 and FDK/USD 2.5, and that the government finds these rates acceptable. To define the basket, it would have to find a number (n_E) of EUR and a number (n_D) of USD such that the EUR has a weight of 60%:

$$\frac{n_E \times 3}{n_E \times 3 + n_D \times 2.5} = 0.6. \tag{2.9}$$

Arbitrarily setting $n_D = 1$, we find $n_E = 1.25$. Thus, President Marx defines the basket as containing USD 1 and EUR 1.25.[19]

Now that we understand how a basket is constructed, let us see how it is used in the central bank's intervention policy. The idea is that the basket should always be worth roughly its target level, FDK 6.25, and not deviate by more than 5%, for example. This implies intervention points of 5.9375–6.5625. At any given moment, the central bank can compute the spot value of the basket. If the basket hits or approaches an intervention point, the central bank intervenes: if the basket is too expensive, the central bank sells USD and/or EUR and buys crowns, and vice versa.

The earliest antecedent of the European Union was the *European Community for Coal and Steel* (ECCS), which started off as a six-country group in 1954 (Benelux (Belgium, the Netherlands, and Luxembourg), France, Germany, and Italy) meant to control Germany's "strategic" coal and steel production under the (thin) guise of a joint management of all six countries' coal and steel sectors. In 1957, the six then signed the *Euratom* Treaty and the Treaty of Rome; both became effective in 1958. The Rome Treaty founded the *European Economic Community* (EEC), which was a customs union topped up with a common agricultural policy and free movement of capital and labor. The ECCS, Euratom, and the EEC were soon merged into the European Community (EC). The United Kingdom, Ireland, and Denmark joined the EC in 1973, Greece in 1981, and Portugal

and Spain in 1986. In 1993, the EC became the *European Union* (EU), by adding plans for a monetary union, a common foreign policy, and police and judicial cooperation. Sweden, Finland, and Austria joined in 1995. The number of members rose from fifteen to twenty-five in 2004, with the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia all joining, and to twenty-seven in 2007 (Bulgaria and Romania).

Panel 2.4. Europe: economic community, community, or union?

Example 2.14. If, for instance, the EUR is trading at FDK/EUR 3.2 and the USD at FDK/USD 2.2, the basket is worth $1.25 \times 3.2 + 1 \times 2.2 = 6.2$. This is well within the admissible band (5.9375–6.5625). If the USD then appreciates to FDK/USD 2.5, the basket's value increases to $1.25 \times 3.2 + 1 \times 2.5 = 6.5$. This is dangerously close to the upper bound, and the Freedonian central bank will probably already be in the market to support the crown.

2.5.4 The 1979–93 Exchange Rate Mechanism of the European Monetary System

The purpose of the European Union's (on the EU, see panel 2.4) initial Exchange Rate Mechanism (ERM) was to restrict the fluctuations of the currencies of the ERM member states relative to each other without, however, restricting the fluctuations of these currencies relative to outside currencies like the USD and the JPY. For this reason, a similar, earlier system was called "the snake." (Picture the member currencies as contained within the skin of a snake, which, as a whole, floats relative to other currencies like the USD and the JPY.) The United Kingdom joined the system as late as 1991, along with (briefly) Italy, and dropped out in 1992. Greece joined only in the late 1990s, as a prequel to the adoption of the EUR. The ERM was the key part of the European Monetary System (EMS), itself a forerunner of the European Monetary Union (EMU).

The ERM was built around a basket of all EU currencies, called the European Currency Unit or ECU.[20] Still, the role of the ECU is different from the role a basket plays in the system described in section 2.5.3, as we shall see. Here is an outline of how the system worked:

- Politicians and experts thrashed out a set of weights based on the members' GDP and share in total trade. At the then-prevailing exchange rates they then constructed a basket that had the same initial value as the European Unit of Account (EUA), a bookkeeping unit for payments among the EC and its member states.[21]
- Each currency had an official target exchange rate against the ECU. The initial levels were just the values of the EUA in each currency, inherited from the days of "the snake." From all these, a full grid of cross-rates between all member countries was computed. For example, if Belgium has BEF/ECU 40 and Germany DEM/ECU 2, the implied "cross" target rate is 20 BEF/DEM.
- Unlike in a pure basket system, intervention was not based on the value of the basket but on each of the bilateral cross-rates. True, one also watched, for each currency, the relative deviation between the actual and target value of the ECU, from which a daily "divergence indicator" was extracted. But this was just a measure of health, not a signal for actual intervention.
- The system was more cooperative than Bretton Woods. First, *both* central banks undertook to maintain, by standard intervention, the actual bilateral rates within a

±2.25% band around the bilateral target parity.[22] Second, governments and central bankers met periodically to coordinate economic policies. Third, de- or revaluations had to be negotiated multilaterally rather than decreed unilaterally.

- Any candidate member had to be able to show respectable records on inflation and interest rates, and a stable exchange-rate history against the ECU, covering two years prior to application.

The early ERM went through fairly frequent realignments. However, by 1990-91, the system seemed very stable, with converging inflation rates across member states. When, in 1990, even Margaret Thatcher admitted that it was not totally inconceivable that the United Kingdom might at some point consider pondering the option of replacing the GBP by some form of common currency, the market went delirious. The euphoria was, however, premature. On September 15, 1992, Finland, which was not a member but had unilaterally pegged its FinMark to the ECU, gave in to continued pressure and abandoned its target rate. Speculation then turned to Sweden, which soon gave up its own unilateral link to the ECU too, and then to the weaker ERM members. In a matter of hours the peseta (ESP) devalued, the lira and pound dropped out of the ERM, and Spain, Portugal, and Ireland reimposed capital controls. George Soros—or his mutual funds—made a billion dollars. But the Banque de France and the Bundesbank were able to successfully defend the FRF/DEM rate, and quiet gradually returned to the markets—until the summer of 1993.

The cause of the currency turmoil during the summer of 1993 was a disagreement about economic policy. The Bundesbank wanted to stamp out inflation (caused by German unification) with a strict monetary policy and high interest rates. Many other countries, including France, preferred to lower interest rates in order to get their economies out of recession. This led to speculation that France might devalue, so as to be able to lower its interest rates. Enormous interventions followed. In the end, the ERM admissible band was widened from 2.25% to 15% each side, which meant a virtual suspension of the ERM. By early 1994, most currencies had returned to rates within or close to the old 2.25% band, and Soros had lost the better part of the billion dollars he had gained in 1992. Still, the message of the 1992–93 turmoil is that the credibility of the system is vital for its survival, and that the only 100% credible regime is one with just a single currency.

2.5.4.1 European Monetary Union and the Euro

The Maastricht Treaty, signed a few months before the 1992 ERM catastrophe, contained, among other things, an EMU plan. To qualify for membership of the Union, a country had to meet the (in)famous *Maastricht criteria*. These included total independence of the central bank from the government, an inflation rate and short-term interest rate that were close to the average for the best performers, a government deficit not exceeding 3% of GDP, and a government debt not exceeding 60% of GDP (or at least showing considerable progress toward that target). Many governments may have been secretly happy with the tough norms: painful policy measures could now be blamed on "Maastricht" or "Brussels,"[23] a practice which also made the EU quite unpopular in some quarters. The United Kingdom and Denmark, feeling that too much sovereign power would be lost by EMU membership, obtained the right

to opt out of the common currency. The European Central Bank (ECB) would be totally independent of politics, and its first aim would be to keep average inflation below 2%; growth and employment were explicitly labeled as secondary. Monetary policy was to be decided by the ECB's board (on which all governors of the national central banks sit, plus the ECB governor and some other ECB top people); the national central banks became mere local implementors. Lastly, a "growth and stability pact" made the *3%* limit on government deficits a permanent rule rather than just an initial prerequisite for membership. A country in breach of the rule could be warned, censored, or even fined, but any such countermeasures would be a political decision, not an automatism.

Table 2.8. The twelve early EUR countries and conversion rates.

Currency	Abbreviation	Rate
Austrian schilling	ATS	13.7603
Belgian franc	BEF	40.3399
Dutch gulden	NLG	2.20371
Finnish markka	FIM	5.94573
French franc	FRF	6.55957
German mark	DEM	1.95583
Irish pound	IEP	1936.27
Italian lira	ITL	0.787564
Luxembourg franc	LUF	40.3399
Portuguese escudo	PTE	200.482
Spanish peseta	ESP	166.386
Greek drachma	GRD	340.750
Slovenian tolar	SIT	239.640
Cypriot pound	CYP	0.585274
Maltese lira	MTL	0.429300

In the fall of 1996 the name of the common currency, the euro (EUR), was agreed upon, and soon thereafter the list of qualifying countries. Greece did not qualify yet (it has joined since, though), the two opt-outs did not want to join, and Sweden said no via a referendum; so, in early 1999 the EMU started with an eleven-country Euroland plus Greece in the antechamber. In the period 1999–2001, rates remained irrevocably fixed, and all interbank finance transactions were expressed in euros rather than the old currencies, as were stock-market prices; but retail transactions, and payments with physical money, remained as before. In 2002 the common currency was finally introduced,[24] physically and in all bank-to-customer relations. The process went off quite smoothly, with hindsight. The *2%* inflation cap has proved hard to meet, however, and is often criticized as economically harmful;[25] nowadays the *2%* figure is a target rather than a cap. Also, the *3%* deficit rule has been enforced unevenly: Portugal was fined, but Greece was let off the hook when it admitted that its books had been cooked (by a previous government, of course). When France and Germany then went into the red, the rule was readily modified: the new version is softer in that it says that, "averaged over the entire business cycle," budget deficits cannot exceed 3%; but the new rule is also tougher in that it requires surpluses in boom periods. The "toughening" was again applied unevenly:

France, Germany, and Italy seemed to go unpunished for taking a very long time to get their act together. In 2007 the freshly elected president of France, Sarkozy, immediately traveled to Brussels to explain the necessity of even more deficits and to ask the Council's pardon. He got it, of course.

Denmark has an ERM-type relation with the euro ("ERM II"), and so have many of the 2005 entrants, notably the Estonian kroon (EEK), the Latvian lats (LVL), the Lithuanian litas (LTL), and the Slovak koruna (SKK). Four other former ERM II countries have already joined: Slovenia, the first of the "new" European members, in 2007; Cyprus and Malta in 2008; and Slovakia in 2009. There have been no big speculative attacks on any of the ERM links, except for a few heady days in the credit-crunchy fall of 2008 (the Baltics and Hungary). In principle, all of the remaining "new" ERM II members are candidates for EMU membership.[26]

The EUR started at USD 1.17 in 1999, then ignominiously sank to 0.80, but in 2004 rose back above par, even going beyond 1.35 early 2005. Most of that was a weakening of the USD rather than a strengthening of the EUR. There are no compelling simple explanations for these swings. Perhaps it was just U.S. hedge funds piling into forex as they did into commodities, and fears that Asian central banks would sooner or later dump their huge dollar balances. The even worse fall of the USD, at the end of 2007 and in early 2008, to below EUR 0.67 (USD/EUR 1.50) and even below CAD 1 probably reflected an increasing lack of confidence in U.S. assets. (Remember that a country with a CA deficit is a net seller of assets not of goods.) U.S. banks were deeper in the subprime-mortgage mess than their overseas colleagues; and big investors, fed up with depreciating dollar assets, effectively started divesting them. However, the sudden weakening of the euro in the fall of 2008, along with the simultaneously crashing oil and commodity prices, suggests that the "deleveraging" (the reduction of speculative positions) by U.S. investors like hedge funds has been a major force behind the price swings.

2.5.5 Other Exchange-Rate Systems

Some countries have an unofficial target rate, and unofficial intervention points, with respect to a single currency or a basket. For example, the Swiss franc and, before EMS membership, the Austrian schilling were kept fairly stable with respect to the DEM. The intervention rates were never explicitly announced—and obviously changed over time.

The central banks of the Group of Five (G5), later expanded to G8,[27] meet twice a year to discuss exchange-rate targets for the three main currency blocks (USD, JPY, and EUR). Central banks occasionally intervened in the USD/DEM and USD/JPY market on a unilateral or coordinated basis (*"dirty floating"*), but there seems to be little of that going on nowadays.

Other countries, including many Latin American countries, have experimented with a *crawling peg* system, where the official parity is revised fairly frequently. This sometimes happens semiautomatically, on the basis of a formula involving, for instance, inflation and balance-of-payments data. In table 2.7, ten countries officially follow this system.

The remaining countries, eighty-one in table 2.7 (plus, for external purposes, the twelve Euroland countries), are floaters. About half of them professedly disregard the exchange rate and only look at internal indicators as a basis for monetary policy. The *"managed float"*

countries combine internal and external indicators without, however, committing to a fixed value or fixed formula.

* * *

The above should have equipped you with enough background insights to start the real stuff. We begin with the currency market and its satellites.

TEST YOUR UNDERSTANDING

Quiz Questions

True-False Questions

1. If a country has a BOP deficit, the total of all BOP subaccounts is negative.
2. The current account is a record of all trade in goods and services, while the capital account is a record of direct and portfolio investment and unilateral transfers.
3. When the U.S. private sector purchases more goods or makes more investments abroad than foreigners purchase or invest in the United States during a year, the Federal Reserve (the U.S. central bank) must make up for the shortfall.
4. All errors and omissions in the BOP are a result of black market transactions.
5. When a corporation purchases a company abroad, and the value of the firm appreciates over time, the NII account and the capital account of the BOP is updated to reflect this change.
6. The BOP theory of exchange-rate determination says that most changes in the exchange rate are due to the arrival of new information about the future.
7. Under a fixed exchange-rate regime, if a country's private sector sells abroad more than it purchases, the central bank must sell foreign exchange.
8. BOP theory is flawed because it assumes that investors only invest in risk-free domestic and foreign assets.

Multiple-Choice Questions

For the following three questions, assume that Antarctica is the home country, and its currency is the Antarctica dollar (AAD), and Greenland is the foreign country and its currency is the Greenland crown (GRK). Choose the correct answer.

1. All else being equal, an increase in income in Greenland leads to:

(a) An increase in consumption in Antarctica, and therefore an increase in imports, resulting in an appreciation of the AAD.
(b) A decrease in consumption in Antarctica, and therefore an increase in exports, resulting in a depreciation of the AAD.
(c) An increase in consumption in Greenland, and therefore an increase in imports, resulting in an appreciation of the AAD.
(d) An increase in consumption in Greenland, and therefore an increase in imports, resulting in a depreciation of the AAD.

2. All else being equal, a decrease in the interest rate r^* in Greenland leads to:
(a) Decreased demand for assets in Greenland, and therefore a depreciation of the GRK.
(b) Decreased demand for assets in Greenland, and therefore a depreciation of the AAD.
(c) An increase in consumption in Greenland, and therefore an increase in imports, resulting in an appreciation of the GRK.
(d) An increase in consumption in Antarctica, and therefore an increase in exports, resulting in a depreciation of the AAD.

3. All else being equal, a decrease in prices in Greenland leads to:
(a) An increase in exports to Antarctica, and therefore an appreciation of the AAD.
(b) An increase in exports to Antarctica, and therefore a depreciation of the AAD.
(c) An increase in consumption in Greenland, and therefore an increase in imports, resulting in an appreciation of the AAD.
(d) A decrease in consumption in Greenland, and therefore a decrease in imports, resulting in a depreciation of the AAD.

Additional Quiz Questions

1. The German subsidiary of a Canadian firm (that is, the subsidiary is owned by the Canadian firm) is sold to a German firm. The Canadian firm invests the funds obtained from the sale in Frankfurt. How is the transaction recorded in the Canadian BOP?
2. The BOP of Timbuktu showed the following entries for 1988: a capital account surplus of 50, a deficit in the services account of 15, and a trade deficit of 45. The change in the official reserves was zero. What was the balance of unilateral transfers for Timbuktu?
3. If the central bank sets an exchange rate that undervalues the foreign currency—and the flows of goods and capital adjust simultaneously—what will be the impact on the following:
(a) RFX (increase/decrease);
(b) BOP (surplus/deficit).
4. If the current account balance has a surplus of USD 2 billion and the official settlements balance (RFX) has a deficit of USD 5 billion, what is the balance of the capital account?
5. A British importer purchases goods from a French company and obtains a trade credit for the full value of the shipment (equal to GBP 100). How should this transaction be recorded in the BOP of the United Kingdom?
6. Numenor, a country on the Atlantis continent, has a government deficit of 40 billion while private investment exceeds private savings by 10 billion. What is Timbuktu's current account balance if its exchange rate is fixed?

Applications

1. Antarctica uses a system of fixed exchange rates, its current-account deficit is USD 6

billion, and its capital account balance is USD 4 billion. Based on this information, answer the following questions.

(a) What is the change in the official foreign exchange reserves of Antarctica?
(b) What is the gap between the income of Antarctica and its expenditure on domestic output?
(c) If there is only one other country in the world, Greenland, can you estimate the current account balance of Greenland?

2. The data below are taken from the BOP of Switzerland. Based on these data, decide whether the following statement is true or false and explain your answer.

From 1979 to 1982, foreigners have been net issuers of SF-denominated bonds in the Swiss capital markets.

Capital account	1979	1980	1981	1982
Portfolio investment (in billions of dollars)	−11.8	−11.8	−11.9	−32.2

3. A company in Philadelphia purchases machinery from a Canadian company for USD 150 and receives one-year's trade credit. The machinery is transported to Philadelphia by a Canadian trucking company that charges the U.S. company USD 10. The U.S. company insures the shipment with a U.S. insurance company and pays a premium of USD 3. After delivering the machinery to Philadelphia, the Canadian truck continues its trip to Houston, where it picks up microcomputers sold by a Texan company to a Mexican company. This shipment, which is worth USD 170, is insured by a U.S. insurance company for a premium of USD 4. No trade credit is given to the Mexican company. Compute the BOP for the United States and assume that Canadian and Mexican companies maintain dollar deposits in New York.

4. Suppose that you are an analyst for the central bank of Zanzibar. Decide how the BOP accounts are affected by the following.
(a) A budget deficit financed by foreign borrowing.
(b) An import quota for foreign cars.
(c) A purchase of a new embassy in Luxembourg.
(d) A grain embargo.

5. The following data are taken from the balance of payments of Freedonia (currency FDK):

Capital account	1995	1996	1997	1998
Portfolio investment (in billions of dollars)	+2.9	−6.9	−5.4	−8.7

Is the following statement consistent with the data shown above?

After 1995, foreigners issued FDK-denominated bonds in the Freedonian capital market in order to take advantage of the favorable interest rate differential with respect to the U.S. capital market.

6. The following passage is from an article that appeared in a newspaper: "Last year, the U.S. demand for capital to fund the federal deficit and to finance private investment in buildings and equipment exceeded net domestic savings by about USD 100 billion." What can we infer about the magnitude of the U.S. current-account deficit?

7. The following passage is from an article that appeared in an old newspaper. Which

account of the German BOP is the article talking about?

> FRANKFURT, West Germany: West Germany's balance of payments, which measures all flows of funds into and out of the country, was in surplus by the current equivalent of USD 210.3 million in February, up from the year-earlier surplus of USD 206.4 million, but sharply lower than January's surplus of USD 10.04 billion, the central bank said January's large surplus was caused in part by heavy central-bank intervention in support of the French franc prior to the realignment of the European Monetary System at mid-month.

8. You have been hired by the IMF to design a program to improve the current account balance. How should your program influence the following variables (increase/decrease):

   (a) taxes;
   (b) government spending;
   (c) private savings.

9. The BOP of the United States in 1982 and 1984 is given below. Is it correct to state, as it has often been done, that the deterioration of the current account was primarily financed by sales of U.S. Treasury securities to foreigners?

U.S. balance of payments (billions of dollars)

	1982	1984
Trade account	−36	−108
Service account	35	17
Unilateral transfer	−8	−11
Current account	−9	−102
Changes in U.S. assets abroad (private) of which:	−108	−16
Portfolio	−8	−5
Bank-reported	−111	−7
Direct investment	6	−6
Other	5	2
Changes in foreign assets in U.S. (private) of which:	92	91
U.S. Treasury security	7	22
Other	85	69
Private capital	−16	75
Official settlements	−8	−3
Statistical discrepancy	33	30

10. Venizio had a government surplus of 15 billion in the year 1988. In addition, private after-tax savings exceeded private investment spending by 10 billion. What was the current account balance of Venizio in 1988?

[1] A related problem with precious metal coins was coin clipping: people scratched off part of the gold or silver around the edge,

which reduced the intrinsic value of the coin but may have passed unnoticed. The ribs or other decorations that can still be seen on the rims of modern coins were originally meant to make coin clipping easier to detect.

[2]During World War II, the German "Operation Bernhard" similarly attempted to counterfeit various denominations between £5 and £50 producing 500,000 notes each month in 1943. The original military plan was to parachute the money on Britain in an attempt to destabilize the British economy, but economists pointed out that it was more profitable to use the notes to make payments throughout Europe. Why give the *seignorage* away, indeed?

[3]A bill of exchange is a summary of the invoice; it is written (drawn) by the seller (drawer) and presented to the customer (drawee), who is asked to accept the bill (that is, acknowledge the existence of the debt by countersigning it) and to return it to the drawer. A promissory note, in contrast, is an "I owe you" note rather than a "you owe me" note; that is, it is written by the customer rather than by the seller. Bills and promissory notes can be sold to investors or can be used to pay off other debts.

[4]This practice started about 1,000 years ago in Italy and went on until the nineteenth century. You can still find references to this practice in Thomas Mann's novel, *Buddenbrooks*, which is set in nineteenth-century northern Germany.

[5]A "note" often means an "I owe you" document; in the United States, 1- to 10-year bonds are called notes, for instance; and we all know about promissory notes (PNs). So "bank note" literally means bank debt.

[6]There are exceptions: in Hong Kong, for instance, notes are still issued by three private banks (Standard Chartered, HSBC, and Bank of China). But even there, these banks are closely supervised by the currency board. In Belgium, the central bank is a listed company, part-owned by the government, by the commercial banks, and by the public.

[7]Israel's experience in the 1970s illustrates this point: when inflation came close to 1,000% per year, people started expressing prices in USD rather than in Israeli pounds. The pound was no longer a trustworthy currency, nor was it a convenient numéraire because prices expressed in pounds had to be changed every day. Similar breakdowns occurred in Germany after World War II, when Lucky Strike cigarettes and chocolate bars became the effective currency.

[8]The International Monetary Fund (IMF) was created as part of the 1944 Bretton Woods Agreement with the mission of providing short-term financing to deserving central banks that wanted to intervene in exchange markets. (Bretton Woods is a ski resort in New England, where the Allies met to hammer out a postwar financial infrastructure.) It is funded by the participating countries. Since the demise of the fixed-rate exchange-rate system and the near-disappearance of intervention, the IMF has become a general lender to governments, often making loans conditional on changes in economic policy and even general policies about institutions. Lately, the Fund (and the World Bank) has been losing business because most countries can nowadays borrow directly themselves.

[9]The country can also borrow, but when the loan matures, it still has to pay with money earned from exports or from the sale of assets. The interest on the loan is the price it pays for postponing the real payment.

[10]This is by definition: a bank is a bank from country X if it has an account with the central bank of country X. The bank may be foreign-owned, but that is another issue entirely.

[11]By wire transfers we mean payments initiated by the payor. Some payments are set in motion by the beneficiary or payee, at least as far as the bank is concerned: checks, promissory notes, trade bills, and acceptances (i.e., accepted bills) are all handed in to a bank by the payee, not the payor. Drawbacks of such payee-driven systems are the mail float (the delay between the moment the check (etc.) is sent by the payor and the moment it is received by the payee and then sent to a bank), plus the risk of tampering by the beneficiary. Payor-driven systems, long popular in many European countries, are nowadays fully electronic (PC banking, internet banking, XML (Extensible Markup Language) instructions to banks). Checks remain popular in the United States, mainly for retail payments. European countries typically also have a *giro* transfer service, run by the post office, but most of these lose market share.

[12]Recall that the money on the central bank account, being pseudo-cash, does not earn interest; so it is costly to have large balances like that. True, the bank can borrow "central bank funds" from another bank, but borrowing is costly too, and netting still means that less is to be borrowed.

[13]This is one reason why such payments are so expensive, in terms of bank fees. The other reasons have to do with the costs of the handling, mailing, recording, etc., of pieces of paper.

In Euroland, the Single European Payments Area (SEPA) directive stipulates that by 2012 interbank payments cannot take more than one day; an older rule also said that inter-Euroland crossborder transfers cannot cost more than domestic ones. At this stage, there are still national clearers, though. The London-based European Bankers Association has set up an international structure, EBA Clearing, but it operates on a strictly members-only basis.

[14]I use "KFA," not "CFA," for the net "capital and financial transactions" account to avoid confusion with the C in "CA," current account; "K" is often used for "capital" in microeconomics or international economics.

[15]The postwar years, when in many countries privately held balances of foreign exchange (and, in some places, even gold)

was illegal, represented a very bad dip in a long tradition of open markets. Especially in the Victorian age and the early 1900s we had a truly global financial market, which has come back only in the late 1980s.

[16]The surplus is usually negative; so *minus* the surplus is called the deficit.

[17]In fact, the government was spending so much *because* the private sector refused to spend. The government's objective was to let the country's yen roll locally rather than disappear abroad. (A large CA surplus necessarily means a large capital outflow, remember?)

[18]The CFA used to be managed by the Banque de France; nowadays, the French Treasury guarantees the rate and provides a credit line to the two CFA central banks.

[19]To verify that the weight of the EUR is 60%, first compute the basket's current value. At the going exchange rates, FDK/EUR 3 and FDK/USD 2.5, one unit of the basket is worth

$$\text{EUR } 1.25 \times 3 + \text{USD } 1 \times 2.5 = \text{FDK } 6.25,$$

such that the euro's weight is indeed $[1.25 \times 3]/6.25 = 0.6$.

[20]Note that, not coincidentally, "ecu" is also the name of an ancient French gold coin—a cousin of the escudo (from Latin, *scutum)*.

[21]The EUA had started off at par with the USD, and became a basket of the (then nine) member currencies in the 1970s. So the similarity in the values of the EUR and USD is not a coincidence.

[22]Still, the central bank with the weak currency had to pay back, sooner or later, all the money spent in interventions by the central bank with the strong money. So the undertaking by (notably) Germany to intervene was not a blank check but just an unlimited credit line to its fellow central banks. A currency could, therefore, still be brought to its knees by speculators if its government thought debts were running up too high.

[23]Maastricht (the Netherlands) was the venue for the meeting that led to the Treaty, but has no permanent EU institutions. Brussels (Belgium) is home to the EU Commission and the Council of Ministers. The Parliament has its ten to twelve annual plenary meetings in Strasbourg (France), on the French-German border, but spends most of its time in Brussels too. The European Court and the European Investment Bank are in Luxembourg, and the European Central Bank is in Frankfurt (Germany).

[24]San Marino and the Vatican, which gave up their liras, and Monaco, which gave up its franc, also introduced the euro in 2002.

[25]One argument is that inflation is overstated in the first place, as the official figure tends to ignore creeping improvements in the quality of goods. Also, moderate inflation allows relative prices or wages in problem industries to fall without need of decreases in nominal terms. (Nominal wage drops are even less popular than real wage drops.)

[26]The GBP and the SEK float, as do the Czech koruna (CZK), the Gibraltar pound (GIP), the Hungarian forint (HUF), and the Polish zloty (PLN). Since two successful ERM II years are a prerequisite for EUR membership, these three "new-Europe" floaters are not trying very hard to join.

[27]G5 consisted of the United States, Japan, Germany, France, and the United Kingdom. Later, Canada and Italy were invited too (G7). Even more recently, Russia has been asked, first as an observer (G7 $\frac{1}{2}$, according to some cynics). A notable meeting was the G5 1985 "Plaza Agreement," where the G5 publicly agreed that the USD should decrease in value. This is often viewed as having provided an important impetus to the drop in the USD after its unprecedented rise in the early 1980s. Recently, *Gx* meetings have been prominent mostly by their lack of visibility.

G6 is an unrelated group: it refers to a club of six major players in the Doha round (a WTO negotiation forum): Australia, Brazil, the EU (whose external trade policy is a supranational matter, implemented by the Commission), India, Japan, and the United States.