swap can have cheaper loan in one of the currencies, while business wise it would be more beneficial for it in the other one. With an exchange rate swap however, it can achieve both goals.

For example, a Hungarian firm supposes its bond would be preferred by German investors, which means–they tend to give loan at lowest interest rate, however the firm's costs and incomes are in Forint. In this case it should issue euro bonds and contract an exchange rate swap to convert the euro cashflow to Forint, so that it can get the lowest debt interest and keep off currency risk. The bank as the counterparty of the swap pays the firm in euro the same amount as the firm has to pay the bond-owners, while the firm pays the bank the payment of the swap in forint (like the interest of the debt). Finally, not only the costs and incomes of the firm are in forint but the interest to be payed for the debt.

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CHAPTER 6 *THE BALANCE OF PAYMENTS*

In this chapter, we are getting prepared to understand international economics by studying the ***Balance of Payments*** (hereinafter "BoP") which is both a certain framework for thinking and a practical statistical "tool" to analyse international economic relations. The BoP has been internationally developed to provide policy decision-makers with consistent and comparable information on economies' external relations. The International Monetary Fund (IMF) first created a manual for reporting balance of payments statistics in 1948. Since then, the IMF has been regularly updating the *Balance of Payments Manual* to respond to economic and financial developments and the accumulation of experience by compilers (IMF, 200)). Nowadays, the notions of the BoP and the data reported accordingly are widely used in economic decision-making while also discussed and even challenged in the literature.

This chapter is structured as follows. In Section 1, the purpose of the BoP is described while taking a first glance at its overall structure. Section 2 introduces basic definitions and principles necessary to compile the BoP of an economy. This is indeed what the Reader is going to do in an example (Section 4), after having studied the content of the rows and columns step by step (Section 3). Finally, the chapter concludes with some remarks on the interpretation and application of the BoP in economic analysis.

6.1 Purpose of the BoP

The BoP *summarises all economic transactions between residents (i.e. the domestic economy) and non-residents (i.e. foreign economies) for a period of time.* It does so in a structured way, with standard rules for the content and entry of data. Figure 1 shows the main structure of the BoP. Section 3 is going to describe each component in detail. Here, it is enough to note that the table is split into two main parts (horizontally): there is a real economic (I-II) and a financial block (III-IV).

This splitting is important because it reveals a more profound purpose of the BoP. By collecting all foreign transactions, it actually aims to determine the domestic economy's net external position, arising from real economic links. As economies trade in goods and services and provide means of production (labour, capital) to each other (with incomes sent and received), deficits and surpluses are likely to arise. This means either foreign borrowing (i.e. getting financed by other economies, in case of a deficit) or foreign lending (in case of a surplus) in net terms in a given period. Thanks to the financial block, the BoP also shows the financial transactions underlying the net foreign borrowing or lending. The net external position is further discussed in Section 3. At this point, the Reader should note that the BoP includes important information on an economy's international financing patterns.

FIGURE 1. THE BALANCE OF PAYMENTS.

	Credit	Debit	Net
I. Current account (CA)			
I.1. Goods			
I.2. Services			
I.3. Incomes			
I.4. Current transfers			
II. Capital account (KA)			
II.1. Non-produced, non-financial assets			
II.2. Capital transfers			
III. Financial account (FA)			
III.1. Direct investment			
III.2. Portfolio investment			
III.3. Other investment			
IV. Change of reserves (dRES)			
V. Net errors and omissions (NEO)	**- - -**	**- - -**	
Balance			**0**

6.2 Basic Definitions and Principles

The BoP is compiled from the viewpoint of an economy regarded as domestic. That is, one can look at the BoP of the U.S. or China or Russia etc. Transactions are recorded vis-á-vis the rest of the world. It follows from the foregoing that notions with bilateral relevance, e.g. exports, imports, claims and liabilities refer to those of the domestic economy.

Residents are the *actors (households, firms, non-governmental organisations [NGOs] and the government) of the domestic economy.* This is an exhaustive definition only at the first glance, though, as the international mobility of people and entities raises questions about what the attribute "domestic" really means. For example, is a French citizen living in the USA an American resident? Is a foreign-owned company resident in the economy where it operates or where its owners reside? To solve this problem, there is a clear rule to classify actors as domestic, i.e. resident. *An actor is resident if its economic interest is predominantly attached to the territory of the domestic economy.* In more practical terms, this means that

- *people are regarded as residents of a certain economy if they stay there for at least one year;*
- *firms and NGOs are regarded as residents of the economy where they operate, i.e. perform the core activities of their business.*

FIGURE 2. THE BALANCE OF PAYMENTS EXPLAINED.

Real economic components of transactions (I-II)

CA + KA = net external position

Financial components of transactions (III-IV)

	Credit	Debit	Net
I. Current account (CA)	**Revenue, income or transfer received** by the domestic economy	**Expenditure, income or transfer sent** by the domestic economy	**= CA**
I.1. Goods			
I.2. Services			
I.3. Incomes			
I.4. Current transfers			
II. Capital account (KA)			**= KA**
II.1. Non-produced, non-financial assets			
II.2. Capital transfers			
III. Financial account (FA)			**= FA**
III.1. Direct investment			
III.2. Portfolio investment			
III.3. Other investment			
IV. Change of reserves (dRES)			**= dRES**
V. Net errors and omissions (NEO)	- - -	- - -	**= NEO**
Balance			**≡ 0**

Here, it should be noted that the "economy" is to some extent different from the geographical territory of the country in question. An "economy" also includes units geographically located in another country, but being under direct domestic control, such as embassies, consulates, military and scientific bases. By the same token, it excludes such units geographically located within the domestic country. The actors of such units are the residents of the controlling economy.

The Reader should find some examples helpful here. Let's decide if the next actors are residents of the U.S.:

a) an American shopkeeper living in Mexico since 1991;
b) John Deere's subsidiary in Russia;
c) Deutsche Bank subsidiary in the U.S.

In case of a), the answer is no because this person has been staying outside the U.S. for more than one year. Regarding b), the answer is no again as this firm operates in

Russia. The case of c) is just the reverse, this firm operates in the U.S. and therefore, it is resident there.

Transactions between residents and non-residents are recorded in the BoP on the basis of the following principles:

- ***Transactions at market value:*** *Transactions are accounted for at market prices even if partners agree otherwise.*
- ***Accrual principle:*** *Transactions are included if and when agreed on by partners, not when payed.*
- ***Double-entry accounting of the transaction value****: Each transaction involves a credit entry and a debit entry (see columns of the BoP in Figure 1). In most cases, this seems logical as transactions are usually exchanges, i.e. two-sided. There may be a real and a financial "side" (e.g. selling a product in exchange for money), or there are purely financial exchanges (e.g. taking out a bank loan, buying a share). However, in case of transfers, the double-entry accounting seems unjustified as transfers are unilateral transactions by definition (e.g. providing food aid does not result in any obligations on the part of the recipient). Nonetheless, this problem is solved by having extra rows for transfers. Thus, the double-entry principle is applied throughout the BoP without exception. This implies the final zero balance (further explained in the following section).*

6.3 Constructing the BoP Step by Step

This section explains the structure of the BoP along with the exact method of entering transactions data into it. Having discussed the double-entry accounting principle, the question naturally arises what "credit" and "debit" mean. In general, they can only be defined rather broadly. The reason is that these terms are interpreted slightly differently in the different parts of the BoP. So generally, it can be stated that *values in credit increase the balances of the parts of the BoP while values in debit decrease them.* This is so because *net value* of each row is calculated as *credit – debit*. By summing up all net values of a part, we get the corresponding aggregate balance (CA, FA, KA, dRes). (The same result is obtained by summing up all credits and debits of a part separately and subtracting the latter.)

Still in general, credit could be loosely labelled as "revenue/inflow" and debit as "expenditure/outflow". Figure 2 points out the accurate meanings which become clear once having studied the contents of the horizontal parts.

As mentioned earlier, the BoP consists of two main horizontal blocks (separated by the dashed line in Figure 2). Into the ***first block (I-II)****, the real economic components of transactions* are entered. Throughout this block, values are accounted for in the ***credit*** column ***if the domestic economy obtains revenue or income in the transaction*** in question. ***Debit*** includes the reverse, i.e. *expenditure or the outflow of income*. This horizontal block is further split into the current account and the capital account.

The ***current account (CA)*** *shows flows of goods and services (trade) and flow of incomes and current transfers*. Particularly, the following rows and contents appear here:

Goods: *This row covers the international trade of products. Export of goods brings about revenues for the domestic economy, so it is entered as credit. Conversely, imports are accounted for as debits.*

Services: *This row covers the international trade of services. Credits and debits in this row are interpreted in the same way as in "Goods".*

Incomes: *In this row, the international flow of incomes of means of production (labour, capital) is accounted for. These incomes are obtained either by workers or by holders of financial or other non-produced assets who provide/rent these for foreign actors. Practically, this row contains salaries and wages, rents, interest incomes and dividends sent and received. If received by the domestic economy, these are entered into the credit column. Debit includes incomes sent abroad.*

> *Compensation of workers appears in this row only if the employer and the employee are resident in different countries. That is the case of workers who work in a foreign economy for less than one year as they are still residents of their economy of origin while getting compensation from a non-resident (a foreign employer). Staying at least one year abroad, these workers themselves become non-resident, though. Consequently, their compensation appears in the BoP only if they decide to send it home. If so, this amount is not regarded as an income any more, but as a (current) transfer because it is unilaterally provided to the home economy.*

Current transfers: *The purpose of this row is to account for a certain type of unilateral transactions. Transfers are considered as "current" if they directly affect the level of disposable income (and hence, consumption possibilities). (By contrast, capital transfers included in the capital account affect the level of wealth.) Typical examples of current transfers are aides, taxes on income and wealth and social contributions and social benefits (e.g. pensions). Moreover, membership fees paid to international organisations are also entered as current transfers. If received by residents, transfers are regarded as credit. Conversely, transfers provided by residents to non-residents are debits.*

The aggregate balance of these rows is known as the current account balance (also denoted by CA).

The **capital account (KA)** includes the following:

Non-produced, non-financial assets: *The term "non-produced, non-financial assets" refers to natural resources and rights to utilise them (e.g. land, mines/mining rights, radio spectra); permissions to undertake specific activities; and patents, copyrights, trademarks, brand names and franchising. The BoP includes transactions of these assets. Entries follow the same logic as in the first two rows of the current account. If residents sell non-produced, non-financial assets to non-residents, the transaction value is entered as credit (revenue to the domestic economy). If such assets are, on the contrary, bought by residents (expenditure), debits appear in the BoP.*

Capital transfers: *Here, the description of "Current transfers" applies except that capital transfers affect wealth.*

The aggregate balance of these rows is known as the capital account balance (also denoted by KA).

The *sum of the balances of the current and capital accounts (CA + KA)* defines ***the net external position of the domestic economy***, i.e. whether it needs foreign financing or is able to finance foreign economies *as an outcome of its provision and use of real economic resources in a given period*. To put it differently, the domestic economy may run an *external deficit* (net borrowing) *or* an *external surplus* (net lending). As all values in the BoP, the net external position is a flow indicator, capturing changes in a stock. An external deficit (in itself) increases the liabilities of the domestic economy vis-á-vis the

rest of the world (or decreases its claims). Conversely, an external surplus (in itself) results in an increase of its claims (or the decrease in its liabilities).

The stock in question is most precisely the ***net international investment position (NIIP)*** which is defined as *the difference between the foreign liabilities and claims of the domestic economy.* At the start of a period, the domestic economy can have either net liabilities or net claims which is changed by the net external position recorded in the BoP for that period. It must be noted, however, that the change of the NIIP is not exclusively driven by the net external position. Revaluations, i.e. changes in prices of assets and exchange rates also affect its value. Consequently, an economy running an external deficit may indeed end up with (higher) net claims if its assets appreciate in the meantime. While revaluations can have particularly important effects in the short run, Obstfeld (2012) nevertheless concludes that regarding long-term patterns, the NIIP is driven primarily by the net external position. (See

The net external position is conceptually equal to the balance of the financial account and the change of reserves (*FA + dRES*). In other words, the ***second block of the BoP (III-IV)*** *shows how the net borrowing from or the net lending to non-residents is financed* as it reveals the various foreign financial transactions in a given period. The **financial account (FA)** records the following:

Direct investment: *Also referred to as foreign direct investment (FDI), this type of cross-border investment arises when an investor acquires significant degree of influence on the management of an enterprise resident in another economy. According to the IMF's BoP standards, there is a significant degree of influence if the investor obtains equity giving it voting power of at least 10 percent in the enterprise. If a non-resident invests in a resident firm, this is entered in the BoP as credit because the liabilities of the domestic economy increase. If residents invest abroad, that is precisely the reverse (increase of claims) and consequently, debit.*

Owning equity in a firm gives rise to claims on that firm. (The best-known signs of that are dividends which, however, trace back to the very fact that the owner has invested part of its wealth into that company. This shareholding appears as an asset in the owner's balance sheet.)

Portfolio investment: *Portfolio investment involves trading financial assets without acquiring significant degree of influence on an enterprise (if this were possible at all). Trade of shares, bonds and other securities is accounted for in this row. Credits and debits are interpreted in the same way as in "Direct investment". Investors involved in portfolio investment can be mostly regarded as financial investors striving for exchange rate gains. By contrast, direct investors are more likely to be strategic investors having long-term interests in the specific business (industry).*

Other investment: *Other investments include, among others, bank loans and trade credits. Credits and debits are interpreted analogously as in the previous two items, with residents taking out loans as credit (increase of liabilities) and granting loans as debit (increase of claims).*

Taking a simple approach, ***reserves*** cover the currency stock of the domestic economy. More precisely, reserves refer to *monetary gold and foreign currency (FX) assets held by monetary authorities (central banks) to meet balance of payments financing needs* (besides other purposes). Here, for simplicity, we assume that all international (FX) payments involve central banks (or less restrictively, that currency is deposited within the domestic two-tier banking system, "channelling" to the central bank). Hence, we can

interpret reserves as “the domestic currency stock” used to pay for imports and including revenues on exports.

The BoP records changes in this stock (***dRES***). If the domestic economy obtains currency (e.g. export revenue), the value is entered into the debit column. Currency outflow (e.g. payment for imports) is accounted for as credit. This is consistent with the interpretations of credit and debit in Figure 2 as a currency is a claim of the domestic economy. It is easy to see that residents with currency “in their pockets” can anytime decide to purchase goods, services etc. from abroad. More sophisticatedly, a currency is a domestic claim because at its very origin, it is a foreign bank’s liability. (Remember Chapter 2 on money creation.)

Having discussed the content of the BoP row by row, the section concludes with drawing attention to the final 0 balance. As already mentioned, $\sum \text{credit} - \sum \text{debit} = 0$ as both columns contain exactly the same values. By calculating the balances of the parts (CA, KA, FA, dRES) first and adding them up, only the order of addition and subtraction is changed. Hence, the following identity holds:

$$\sum \text{credit} - \sum \text{debit} = CA + KA + FA + dRES = 0$$

Note that in practice, the BoP is compiled by statistical authorities on the basis of a huge number of transactions reported by many economic agents. Therefore, the final 0 balance is usually not obtained due to statistical errors and omissions. *To achieve the conceptual zero, the value of the actual deviation is entered appropriately into* the technical row ***“Net errors and omissions” (NEO).***

In this **example**, let Hungary be the domestic economy. Transactions are then accounted for in Hungarian forints (HUF) (though overwhelmingly FX denominated in reality). After having recorded all transaction values, the Reader shall be able to determine the net external position of Hungary in this hypothetical example.
Transactions taking place over a period are the following:

(1) A Hungarian company buys goods worth 10 million HUF from a foreign company, and it pays in euros.

(2) A Hungarian company sells services worth 6 million HUF to a foreign partner who promises to pay later.

(3) A domestic, American-owned company sends dividends in USD worth 20 million HUF into the U.S.

(4) A domestic foundation grants food aid worth 4 million HUF to an African country hit by drought.

(5) The state budget repays debt denominated in EUR (worth 100 million HUF) to a foreign bank (principal payment).

(6) The foreign buyer settles half of its debt arising from transaction 2).

(7) A domestic company decides to set up a subsidiary in Italy. Aiming to develop its production there, it makes the investment (50 million HUF) in kind: it hands over production lines and raw materials to the subsidiary.

(8) A foreign media company successfully applies to broadcast on a domestic radio frequency. The media authority charges 200 million HUF for the use which the company promises to pay.

(9) A domestic company buys industrial robots from its foreign parent. The robots are worth 50 million HUF, but the company pays only the equivalent of 30 million HUF for them.

(10) A foreign investor buys shares worth 20 million HUF at the Budapest Stock Exchange, acquiring 1% of the shares of a domestic public limited company. (Payment in EUR.)

Solutions:

(1) This is import of goods, i.e. expenditure of Hungary, settled by immediate payment.

Credit: Reserves, 10 million (outflow)
Debit: Goods, 10 million (import)

(2) This is export, so almost the reverse of (1), except that services are traded and payment is expected to occur at a later date.

Credit: Services, 6 million (export)
Debit: Other investment, 6 million (trade credit extended by Hungary

(3) Note that this company is resident in Hungary, so its transactions with its non-resident U.S. owners are rightly to be entered in the BoP. In this case, dividends are income of the U.S. owners earned by providing capital to Hungary.

Credit: Reserves, 20 million (outflow of currency)
Debit: Incomes, 20 million (income sent abroad)

(4) This is the "classic" case of current transfers, with food increasing the consumption possibilities of recipients. The use of the row "Current transfers" is evident from the above while the transaction itself materialises as an outflow of goods. In fact, export is registered which, however, does not result in any claims on the part of the aid provider. (Note that credit and debit cancel out each other, with no balance appearing in the CA.)

Credit: Goods, 4 million (export)
Debit: Current transfers, 4 million (transfer sent)

(5) This is a decrease of liabilities of Hungary, involving payment in EUR.

Credit: Reserves, 100 million (outflow of currency)
Debit: Other investment, 100 million (debt repayment)

(6) There remains 3 million EUR still outstanding as trade credit. The other half is obtained in cash. This item involves a change in the form of a domestic claim only.

Credit: Other investment, 3 million (decrease of claims)
Debit: Reserves, 3 million (inflow of currency)

(7) Here, a direct investment is made by the domestic company as it sets up a fully owned enterprise abroad. The capital is granted in kind (flow of goods).

Credit: Goods, 50 million (export)
Debit: Direct investment, 50 million (investment made abroad)

(8) The right to use a radio frequency is a non-produced, non-financial asset. In this case, this right is bought by a non-resident, providing revenue to Hungary. The promise to pay later is regarded as a trade credit already seen in (2).

Credit: Non-produced, non-financial assets, 200 million (revenue)
Debit: Other investment, 200 million (claim on the foreign company)

(9) The industrial robots are imported from abroad. This is import as assets are sold and purchased by the parties. (So this is not an investment that would bring about the increase of the subscribed capital of the subsidiary, regarding the full ownership here). Still, there is an element which reflects the relationship between the two companies. Note that the industrial robots are worth 50 million EUR at market prices. However, the subsidiary is

offered a more favourable price, and no further liability arises in this transaction itself. That is, a transfer is provided affecting the stock of assets in Hungary.

Credit: Capital transfer, 20 million (transfer received)
Credit: Reserves, 30 million (outflow of currency)
Debit: Goods, 50 million (import)

(10) As less than 10% of the shares is taken over, this is a portfolio investment.

Credit: Portfolio investment, 20 million (investment in a Hungarian entity)
Debit: Reserves, 20 million (inflow of currency)

As a result of all the transactions, Hungary ends up with an **external surplus of 196 million HUF** in this period. This, *ceteris paribus*, means that its NIIP "improves", with net liabilities decreased or net claims increased at the end of the period.

6.4 Concluding remarks

In this chapter, the international balance of payments has been presented. The purpose of the BoP is to summarise all economic transactions between residents and non-residents for a period of time. A key notion of the BoP is the net external position which is the balance of the real economic transactions recorded. Although the net external position is an important marker of changes to external indebtedness, the net approach in itself is not sufficient to uncover all relevant financing patterns**.** It is apparent from the BoP compiled in the example in Section 4 that gross flows are much bigger than the net external position. This is of particular relevance in the case of the financial block of the BoP. In a world of huge global capital flows and complex financial links, stability concerns may well arise from financial transactions mostly appearing only in the financial block.

Note that purely financial transactions appear only in the financial account and the row „change of reserves", but not in their final (net) balance as they cancel out when calculating it. Examples are transactions 5), 6) and 10) in Section 4.

Attention to gross values is also vindicated by the related fact that claims (resulting from surpluses) of some domestic actors are not directly available to settle the liabilities of others. So even if the domestic economy runs large external surpluses and hence, accumulates huge foreign claims in net terms, there are possibly actors who are (externally) indebted. If these debts happen to be unsustainable for whatever reason, a debt crisis may erupt due to spill-over effects.

However, the importance of the gross approach does not annul the relevance of the net external position in economic analysis. Sustained net patterns may signal underlying disturbances, "imbalances" in an economy or a group of economies. Recurrent external deficits and countervailing surpluses may thus provide early warning of crises, e.g. international debt crises. Empirical evidence shows that external positions had become increasingly polarised in the case of the U.S. and China and within the euro area before the 2008 crisis.

In case of emerging economies, catching up usually involves external deficits for several consecutive periods as advanced technologies can possibly be accessed only from abroad, or to put it differently, there is no sufficient internal capacity to invest. If external financing is really used to achieve higher competitiveness (boosting export revenues to repay debts), there is no threat of unsustainability. It is hard, however, to come clear on this in advance.

While it is difficult to tell *ex ante* if sustained external positions are truly problematic in a certain case, this chapter concludes with arguing that they are definitely worth of attention and further analysis.

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CHAPTER 7 *FOREIGN EXCHANGE MARKETS*

7.1 Introduction to FX-markets

The price of one nation's currency in terms of another is the so called FX-rate or exchange rate; the place where different currencies are exchanged is the foreign exchange market. This is the largest financial market: with a global trading of 7/24, the total amount of FX traded daily is about 5 trillion USD. The global trading of currencies is the fundamental of international economic relations, and therefore a key variable for the economic policy as well.

This is a meeting point between many participants of the economy. Firms engaged to international trade are exposed to the movements of exchange rates. Importers of goods are having expenses in foreign currencies and revenues in the domestic currency; exporters are having revenues in foreign and expenses in the local currency. However, usually they do not change their exposure directly, but seek the adequate liquidity on the global market, usually via banks and other institutions. FX-risk management provides hedge against volatile exchange rate movements. Some participants take this risk on their balance sheets for profit seeking reasons thus providing hedge to those who want to get relieved of their exposure.

"Key currencies" are the currencies of the major economies. The US Dollar (USD) is called the 'world currency', the euro (EUR), the Swiss franc (CHF), the Japanese yen (JPY) are the most traded currencies besides the US dollar. Other currency pairs, such as Hungarian Forint (HUF) / South African rand (ZAR) cannot be traded directly, but usually via key currencies.

A ***foreign exchange quotation*** (or quote) is *a statement of willingness to buy or sell at an announced rate*. The CUR1/CUR2 quotation may seem a bit confusing or non-intuitive. The currency to the left of the slash is called the base currency or the unit currency. The currency to the right of the slash is called the price currency or quote currency. The quotation always indicates the number of units of the price currency, CUR2, required in exchange for receiving one unit of the base currency, CUR1.

For example, the most commonly quoted currency exchange is that between the US dollar and the euro. The quotation **EUR / USD 1.2174** designates the euro (EUR) as the base currency, the dollar (USD) as the price currency, and the exchange rate is USD 1.2174 = EUR 1.00.

A ***direct quote*** is *the price of a foreign currency in domestic currency units*. An ***indirect quote*** is *the price of the domestic currency in foreign currency units*. In retail exchange in many countries (such as currency exchanged in hotels or airports), it is a common practice to quote the home currency as the price and the foreign currency as the unit.

A woman walking down the Avenue des Champs-Elysées in Paris might see the following quote: **EUR 0.8214** / **USD 1.00** Since in France the home currency is the euro (the price) and the foreign currency is the dollar (the unit), in Paris this quotation is a direct quote on the dollar or a price quote on the dollar. Verbally, she might say to herself, "0.8214 euros per dollar," or "it will cost me 0.8214 euros to get one dollar." These are European terms.

At the same time a man walking down Broadway in New York City may see the following quote in a bank window: **USD 1.2174 / EUR 1.00** Since in the US the home currency is the dollar (the price) and the foreign currency is the euro (the unit), in New York this would be a direct quote on the euro (the home currency price of one unit of foreign currency) and an indirect quote on the dollar (the foreign currency price of one unit of home currency). The man might say to himself, "I will pay $1.2174 dollars per euro." These are the American terms.

The two quotes are obviously equivalent (at least to four decimal places), one being the reciprocal of the other: 1 **EUR 0.8214/USD** = **USD1.2174/EUR**

Although a newspaper or magazine article will state an exchange rate as a single value, the market for buying and selling currencies, be retail or wholesale, uses two different rates, one for buying and one for selling. The ***bid*** *is the price in one currency at which a dealer will buy another currency*. The ***ask*** *is the price at which a dealer will sell the other currency*. Dealers bid (buy) at one price and ask (sell) at a slightly higher price, making their profit from the spread between the prices. The bid-ask spread may be quite large for currencies that are traded infrequently, in small volumes, or both. Bid and ask quotations in the foreign exchange markets are superficially complicated by the fact that the bid for one currency is also the offer for the opposite currency. A trader seeking to buy dollars with euros is simultaneously offering to sell euros for dollars. For simplicity we regard to FX-rates as mid rates (average of bid and ask) from now on.

7.2 FX markets: demand and supply

FX rates can be modelled in a simple supply-demand framework. To avoid ambiguity the market is observed from a domestic point of view. Demand and supply of foreign currencies can be connected to the international transactions of the home economy. Imports of goods and services and exports of capital generate FX demand, while exports of goods and services and imports of capital generate supply.

If a Hungarian company buys foreign goods - for example Swedish furniture - it has to buy foreign exchange first: ***import of goods → FX demand***

If an investor who has HUF-denominated assets in Hungary - for example a bank deposit - wants to reallocate his portfolio by investing in American treasuries, has to buy US dollar first: ***export of capital → FX demand***

If a Hungarian manufacturer sells her product to a French merchandise retailer and is paid in euros, the she has to sell the euros for Forints, because she pays salaries, taxes, her domestic suppliers in Forint: ***export of goods → FX supply***

If German investors want to buy shares on the Budapest Stock Exchange, they have to sell euros for forint: ***import of capital → FX supply***

The market is in equilibrium when the quantity of foreign currency demanded equals the quantity supplied (Figure 1). If export of goods or import of capital increases, the supply curve shifts to the right, and the equilibrium exchange rate decreases (Figure 2, left hand panel). This is called the appreciation of the home currency (or the depreciation of the foreign currency). An increase of import of goods or of export of capital shifts the demand curve right, and the home currency depreciates (Figure 2, right hand panel).

FIGURE 1: THE FX MARKET.

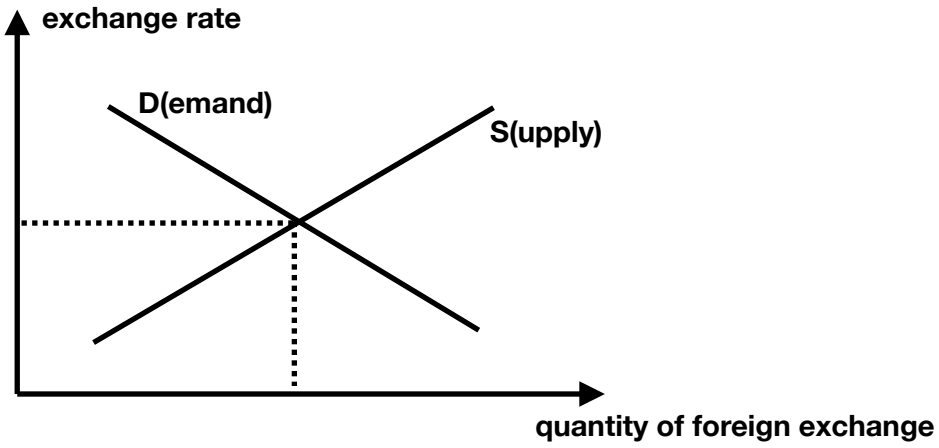
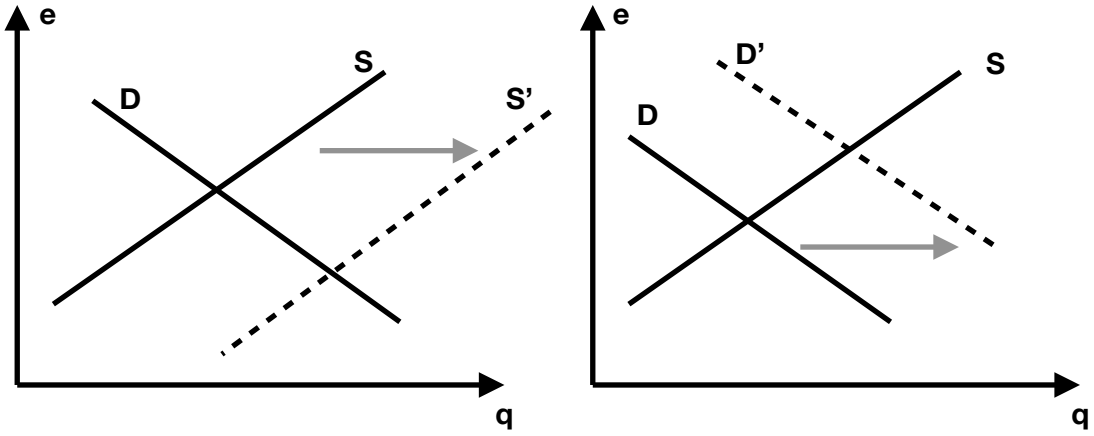


FIGURE 2: APPRECIATION (LEFT) AND DEPRECIATION (RIGHT) OF THE HOME CURRENCY.



7.3 Exchange-rate theories

A practical point for understanding how exchange rates are determined is a simple idea called the law of one price. If two countries produce an identical good, and transportation costs and trade barriers are very low, or non-existing the price of the good should be the same throughout the world no matter which country produces it. One of the most prominent theories of how exchange rates are determined is the theory of ***purchasing power parity*** (PPP). It states that *exchange rate between any two currencies will adjust to reflect changes in the price levels of the two countries*. The theory of PPP is simply an application of the law of one price to national price levels.

> Suppose that German steel costs 100 euro per ton and Japanese steel with the same quality costs 10,000 yen per ton. For the law of one price to hold, the exchange rate between the yen and the euro must be 100 yen per euro (€0.01 per yen), so that one ton of German steel sells for 10,000 yen in Japan (the price of Japanese steel) and one ton of Japanese steel sells for €100 in Germany. If the exchange rate were 200 yen to the euro, Japanese steel would sell for €50 per ton in Germany or half the price of German steel, and German steel would sell for 20,000 yen per ton in Japan, twice the price of Japanese steel. This situation generates excess demand for the Japanese steel, excess supply of the German steel and a demand for the yen (as German companies buy yen for euro). As a result, the price of Japanese steel increases, the price of German steel decreases, and the EUR/YPN exchange rate decreases (the yen appreciates) until the exchange rate equals the ratio of the two prices.

Applying the law of one price to the price levels in the two countries produces the theory of purchasing power parity, which claims that if the Japanese price level rises 10% relative to the Eurozone price level, the euro will appreciate by 10%. As our example illustrates, the theory of PPP suggests that if a country's price level rises relative to another's, its currency should depreciate (the other currency should appreciate). Another way of thinking about purchasing power parity is through a concept called the ***real exchange rate***, *the rate at which domestic goods can be exchanged for foreign goods*. In effect, it is the price of domestic goods relative to the price of foreign goods denominated in the domestic currency.

> If a basket of goods in New York costs $50, while the cost of the same basket of goods in Tokyo costs $75 because it costs 7,500 yen while the exchange rate is at 100 yen per dollar, then the real exchange rate is 0.66 (= $50/$75). The real exchange rate is below 1.0, indicating that it is cheaper to buy the basket of goods in the United States than in Japan.

The real exchange rate indicates whether a currency is relatively cheap or not. Another way of describing the theory of PPP is to say that it predicts that the real exchange rate is always equal

to 1.0, so that the purchasing power of the dollar is the same as that of other currencies such as the yen or the euro.

This prediction of the theory of PPP could work out in the long run. From 1973 to 2013, the British price level rose 102% relative to the U.S. price level, and as the theory of PPP predicts, the dollar appreciated against sterling, though by 60%, an amount smaller than the 102% increase predicted by PPP. Yet, as the same figure indicates, PPP theory often has little predictive power in the short run. From early 1985 to the end of 1987, for example, the British price level rose relative to that of the United States. Instead of appreciating, as PPP theory predicts, the U.S. dollar actually depreciated by 40% against the pound. So even though PPP theory provides some guidance to the long-run movement of exchange rates, it is not perfect and in the short run it is a particularly poor predictor. What explains PPP theory's failure to predict well? The PPP conclusion that exchange rates are determined solely by changes in relative price levels rests on the assumption that all goods are identical in both countries and that transportation costs and trade barriers are very low. When this assumption is true, the law of one price states that the relative prices of all of these goods (that is, the relative price level between the two countries) will determine the exchange rate. The assumption that goods are identical may not be too unreasonable for German and Japanese steel, but is it a reasonable assumption for American and Japanese cars? Is a Toyota the equivalent of a Chevrolet? Because Toyotas and Chevys are obviously not identical, their prices do not have to be equal. Toyotas can be more expensive relative to Chevys and both Americans and Japanese will still purchase Toyotas. Because the law of one price does not hold for all goods, a rise in the price of Toyotas relative to Chevys will not necessarily mean that the yen must depreciate by the amount of the relative price increase of Toyotas over Chevys.

Furthermore, PPP theory does not take into account that many goods and services (whose prices are included in a measure of a country's price level) are not traded across borders. Housing, land, and services such as restaurant meals, haircuts, and golf lessons are not traded goods. So even though the prices of these items might rise and lead to a higher price level relative to another country's, the exchange rate would experience little direct effect. As empirical studies find PPP can hardly explain the change of exchange rate, so it is not suitable for forecasting or operative decision making.

In the short-run exchange rates are determined by capital flows. With free capital mobility investors (re)-optimise their portfolios according to changes in expected returns and risks. Suppose that there are two portfolios, the home portfolio (H) and the foreign portfolio (F) characterised by the (r_H, σ_H) and (r_F, σ_F) expected return - risk pairs respectively. Assuming that investors are risk-averse, a change in either of the four elements leads to a shift in portfolio weights. If the return of the home portfolio increases, investors reallocate their investments towards the home country, thereby appreciating the home currency. A decrease of the risk of the home portfolio leads to the same result. These are the cases of capital import from a domestic point of view. Capital export and thereby depreciation can be triggered by either a decrease of the $(r_H - r_F)$ difference or by an increase of the $(\sigma_H - \sigma_F)$ difference.

7.4 Exchange-rate systems

Normally, the trend of the exchange rate is determined by the fundamentals of the economy. The real appreciation of the home currency in the long rung is the mirror image of a higher potential growth rate of the home economy. However, capital movements triggered by the changes of investors return-risk perceptions can divert the exchange rate from its long-run trend. Though they are temporary, these diversions can cost economic agents a lot.

Suppose that a Hungarian company imports raw material from Brazil, and sells its product in Germany. Both the import and the export are settled in euro. Suppose furthermore that the long-run equilibrium exchange rate is 320 EUR/HUF, and the company buys the euro to pay for the import at this rate. However, by the time it finishes manufacturing and sells the product, the Forint has appreciated by 5 percent, thus the rate at which the company can sell the euros received for the export is 304 EUR/HUF. If the competition is fierce in the industry, this change can turn the company's profit into a loss.

The higher the openness - measured by the total value of exports and imports relative to the GDP - of an economy is, the more sensitive its performance is to exchange rate movements. Especially in small open economies the exchange rate is the most important element of the price system. Therefore economic policies have to define their relation to the exchange rate by determining an exchange rate regime.

The exchange rate regime is called ***floating*** when *market demand and supply determines the FX rate* without any central bank intervention. The central bank can influence the exchange rate both as a market participant and both as an authority. In the first case it sell (buys) foreign currency if it wants to strengthen (weaken) the home currency. As an authority the central bank can restrict convertibility by imposing barriers to currency exchange. In formal terms a central bank intervention shifts either the demand or the supply curve to the right, restricting convertibility shifts these curves to the left.

In a ***fixed exchange rate system***, *exchange rates are either held constant or allowed to fluctuate only within an explicit band.* In general, the central bank must offset any imbalance between demand and supply conditions for its currency in order to prevent its value from changing.

In 2001 the Hungarian central bank introduced a fixed exchange rate regime with a $\pm 15\,\%$ band. The centrum of this band was 286 EUR/HUF the weak and the strong edges were 324 HUF/EUR and 240 HUF/EUR respectively. Market forces could freely determine the exchange between these two values. However whenever the exchange rate reached the weak (strong) edge the central bank had to sell (buy) euros to keep the exchange rate within the band.

Central banks can strengthen the home currency to the extent of their foreign reserves. Buying FX is not technically constrained, because the central bank creates the home currency. However, as money creation can threaten the central bank's inflation target (see Chapter 2), sooner or later intervention has to be suspended.

When the central bank bank bumps into one of these constraints, it can either reset or exit the exchange rate regime. Reseting means that the parameters of the band are changed. In case of a weakening home currency and insufficient FX reserves the central bank ***devalues*** the home currency by *setting the centrum of the band higher*. Devaluation is a legal act, an official admission that the home currency was overvalued before. In case of appreciation and fear of inflation the central bank ***revalues*** the home currency by *setting the centrum of the band lower*. A third case of reseting the fixed exchange rate regime is broadening the band.

In February 2008 a massive capital inflow appreciated the Hungarian Forint, and the exchange rate reached the 240 EUR/HUF limit. However, the Hungarian Central Bank did not intervene, instead it changed the exchange rate regime from a fixed to a floating one.

A fixed exchange rate can be beneficial to a country for several reasons. First, exporters and importers on the goods and services markets can engage in international trade without concern about exchange rate movements. Any firms that accept the foreign currency as payment would be insulated from the risk that the currency could depreciate over time. In addition, any firm that need to obtain that foreign currency in the future would be insulated from the risk of the currency appreciating over time. Firms can engage in direct foreign investment as well, as they hopefully can convert their foreign currency earnings into home currency without a major change in the exchange rate. Third, investors would be able to invest funds in foreign countries without concern that the value of their investments decreases because of an appreciation.

A disadvantage of a fixed exchange rate system is that there is still a risk of the central bank changing its currency's value. Furthermore, from a macroeconomic point of view, a fixed exchange rate system may render the country more vulnerable to economic conditions in other economies. Remember, PPP claims that the the home and foreign inflation rates are in a long-run equilibrium relationship with the exchange rate. If the exchange rate is fixed, the inflation rate of the other economy is imported. Thus with a fixed exchange rate a high foreign inflation can hurt the home economy. A floating exchange rate system can insulate the home economy from the inflation of other countries.

> If the United States experiences a high rate of inflation, then the resulting increased US demand for UK goods will place upward pressure on the value of the British pound. The appreciation will make UK goods more expensive for US consumers, even though UK producers have not raised their prices. The higher prices are caused by the pound's appreciation; that is, a greater number of dollars are now required to buy the same number of pounds. In the United Kingdom, the actual price of the goods (as measured in British pounds) may be unchanged. Even though US prices have increased, UK consumers will continue to purchase US goods because they can exchange their pounds for more US dollars.

Another advantage of a floating exchange rate is that a country is more insulated from unemployment problems in other countries.

> Under a floating rate system, the decline in US purchases of UK goods will lead to reduced US demand for British pounds. Such a demand shift could cause the pound to depreciate against the dollar. This depreciation will make British goods cheaper for US consumers than before, offsetting the reduced demand for these goods that may follow a reduction in US income. As was true with inflation, a sudden change in unemployment will have less effect on a foreign country under a floating rate system than under a fixed rate system.

These examples illustrate that in a freely floating exchange rate system, the problems experienced in one country will not necessarily be contagious. Exchange rate adjustments serve as a form of protection against "exporting" economic problems to other countries. An additional advantage of a freely floating exchange rate system is that a central bank is not required to constantly maintain exchange rates within specified boundaries. It is therefore never required, just for the sake of controlling exchange rates, to implement an intervention policy that could have an unfavourable effect on the economy. Furthermore, each government is free to implement policies irrespective of their effect on the exchange rate. Finally, if exchange rates were not allowed to float, then investors would invest funds in whatever country had the highest interest rate. The likely result would be governments of countries with low interest rates seeking to restrict the exit of investor funds from the country. Hence there would be more restrictions on capital flows, and financial market efficiency would be reduced.

In the previous example, the United Kingdom is somewhat insulated from the problems experienced in the United States because of the freely floating exchange rate system. Although

an advantage for the protected country (here, the United Kingdom), this insulation can be a disadvantage for the country that initially experienced the economic problems.

> If the United States experiences high inflation then the dollar may weaken, thereby insulating the United Kingdom from the inflation (as discussed previously). From the US perspective, however, a weaker US dollar causes import prices to be higher. This may increase the price of US materials and supplies, which in turn would increase US prices of finished goods. In addition, higher foreign prices (from the US perspective) can force US consumers to purchase domestic products. As US producers recognise that their foreign competition has been reduced by the weak dollar, they can more easily raise their prices without losing customers to foreign competition.

In a similar manner, a freely floating exchange rate system can adversely affect a country that has high unemployment.

> If the US unemployment rate is rising then US demand for imports will decrease, putting upward pressure on the dollar's value. A stronger dollar will then cause US consumers to purchase foreign rather than US products because the foreign products now can be purchased cheaper. However, that reaction can be detrimental to the United States during periods of high unemployment.

CHAPTER 8 *PUBLIC FINANCE AND TAXATION*

8.1 The economic functions of the government

The modern state has three economic functions according to Musgrave. These are:

- *allocation,*
- *redistribution,*
- *stabilization.*

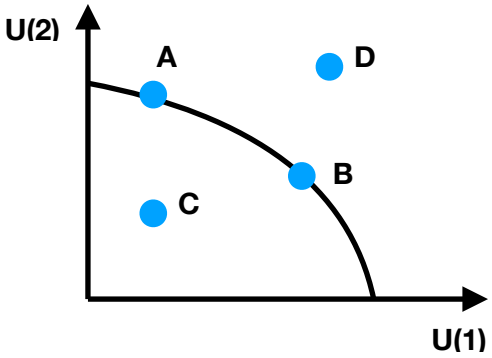
These functions represent the necessity of public sector in the economy. There is another so-called prefunction or zero function namely the creation of legal institutions. Examine the functions in order.

Allocation of resources

According to the ***First Fundamental Theorem of Welfare Economics*** the *perfect competition leads to Pareto-efficient allocation of resources.* In Pareto optimum no individual utility can be made better off cannot without worsening someone else's utility.

The Utility Possibilities Curve shows the maximal available utility of the second person (or social class) in function of the achieved utility of the first person (or social class) at a given level of resources of the examined economy. (Figure 1) Point "D" signs an unavailable output, point "C" is a suboptimal, while point "A" and "B" are Pareto-optimal.

FIGURE 1: UTILITY POSSIBILITIES CURVE



If the conditions of First Welfare Theorem are not met, the resource allocation will not be Pareto-optimal (point "C"). The market failures are the following:

- *public goods,*
- *externalities,*
- *asymmetric information,*
- *monopoly.*

Public goods have two characteristics: their *consumption is non-rivalrous and non-excludable*. A good or service is non-rivalrous when someone's consumption does not disturb others' consumption. Individual utility from consumption will not be less if other individuals consume the same good. A good or service is non-excludable if it is possible to prevent consumption in case of non-payment. By the two characteristics four sets of groups can be constructed (Table 1).

TABLE 1: THE SETS OF GOODS.

Consumption	Excludable	Non-excludable
Rivalrous	Private goods (*apple*)	Common goods (*air*)
Non-rivalrous	Club goods (*theatre*)	Public goods (*lighthouses*)

Why does the market fail in the case of public goods while in the case of the private goods it works efficiently? If no one can be excluded from the consumption of a good and at the same time the consumption does not disturb others then nobody will be interested in producing this good. ***Free riding*** is a rational habit/attitude: just *enjoying the produced good but not participating in the financing/funding*. If everyone thinks rationally no one will produce public goods, however, there is a massive demand for them. In the implementation of producing public goods the government can play a role. If the market cannot achieve the Pareto-optimal resource allocation (market failure), then the government has to intervene and solve the problem. In this case the public sector can improve the efficiency – we call it Pareto-improvement. Adam Smith also supported the state's intervention in the case of public goods, however, he devoted minimal role to the public sector.

The second type of market failures is ***externality***. When *an economic actor does not calculate with every consequence of his activities* we speak about external economic effect. Imagine a company that works near by a river and pollutes it.

> Suppose, that the company does not care about the pollution while calculating the costs and returns. The marginal profit function is decreasing in line with the quantity of production as Figure 2 shows. This marginal profit becomes 0 when the production achieves the quantity Q'. Above this quantity the total profit will decrease because the marginal profit will be negative. At this point (Q') the profit is at its maximum so this represents the market equilibrium. Assume that there is a beach near by the river a few kilometres away from the factory. The pollution of the factory causes cleaning costs for this beach. This (external) costs are increasing in line with the quantity of production as Fig. 2 shows. The external costs and the marginal profit functions cross at quantity Q*. This is a special point. The whole marginal profit function for the society (hereafter the social marginal profit) comes from the distinction of individual marginal profit and the external cost functions (see Figure 3). At Q* the social marginal profit is zero. This point will be the Pareto-optimal quantity. If the factory produces less than Q*, its marginal profit would exceed the external cost of pollution so the company would be able to compensate the cleaning cost of the beach. If the factory compensates the beach indeed the company can increase its production until Q*. If the production exceeded Q*, the marginal profit wouldn't be able to compensate the external costs since it is less than the external cost. At point Q* nobody's utility can improve without damaging anyone else's utility.