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International Trade, Finance and Development

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Published in:
Contemporary Issues in Development Finance

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2020

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):
Brakman, S., & van Marrewijk, C. (2020). International Trade, Finance and Development. In J. Y. Abor, R. Lensink, & C. K. D. Adjasi (Eds.), *Contemporary Issues in Development Finance* (pp. 351-384). Routledge.

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CHAPTER 13

International trade, finance, and development

Steven Brakman and Charles van Marrewijk

13.1 INTRODUCTION

When (developing) countries trade with other countries, they are confronted about financial interactions and forces that affect the way they do business and limit the possibilities and effectiveness of certain types of policies. The power of these financial forces is enormous. According to the Bank of International Settlements (BIS, 2019), the *daily* turnover on financial markets for all instruments on a net-net basis in April 2019 was USD6.6 trillion, which is equivalent to about 8% of the total world income in one *year*.[1] In this chapter, we briefly discuss the main interactions, forces, limitations, and possibilities of trade with other countries.

We start in section 13.2 by discussing the main aspects of exchange rates, the price of one currency in terms of another. In section 13.3, we emphasize the importance of forward-looking markets for understanding the power of financial forces. These aspects are combined in section 13.4, where we discuss covered and uncovered interest rate parity, which is crucial for understanding the possibilities and limitations of monetary policy, as explained in section 13.5. Using this theoretical basis, in section 13.6 we review the main policy choices made in recent history up to this day. Next, we turn our attention in section 13.7 to the practical issues of trade financing and trade financing gaps. Section 13.8 covers the practical issues of international (vehicle) currencies. We conclude in section 13.9 with a brief discussion of finance, investment, and development and provide a summary in section 13.10.

13.2 EXCHANGE RATES

In international trade flows, the exporters and importers at some point in time are confronted with *exchange rates* when they have to exchange goods or services valued in one currency in exchange for another currency. An exchange rate is a price, namely the price of one currency in terms of another currency. This price is determined simply by supply and demand in the foreign exchange market. As there are many countries with convertible currencies, there are many exchange rates, such as the exchange rate

of a Singapore dollar in terms of European euros or the exchange rate of a Japanese yen in terms of British pounds.

Since the exchange rate is a price, a rise in the exchange rate indicates that the item being traded has become more expensive, just like any other price rise indicates. Therefore, if the exchange rate of a Singapore dollar in terms of European euros rises, this indicates that the Singapore dollar has become more expensive. Various specialized symbols have been introduced to identify specific currencies, such as US$ to denote (US) dollars, € to denote European euros, £ to denote (British) pounds, and ¥ to denote Japanese yen or Chinese yuan. Table 13.1 lists some of these international currency symbols and the three-letter international standard (ISO) code to identify the currencies.

As will be discussed later on, there are various types of exchange rates, but we first focus on the *spot* exchange rate, the price of buying or selling a particular currency at this moment. Table 13.2 lists some spot exchange rates as recorded on 3 December 2019, at 11:55:00 a.m. (UTC + 01:00).[2] The fact that we have to be so precise by listing not only the day on which the spot exchange rates were recorded but also the exact time and the time zone

TABLE 13.1 Some international currency symbols

Country	*Currency*	*Symbol*	*ISO code*
Australia	dollar	A$	AUD
Canada	dollar	C$	CAD
China	yuan	¥	CNY
EMU countries	euro	€	EUR
India	rupee	Rs	INR
Iran	rial	RI	IRR
Japan	yen	¥	JPY
Kuwait	dinar	KD	KWD
Mexico	peso	Ps	MXP
Saudi Arabia	riyal	SR	SAR
Singapore	dollar	S$	SGD
South Africa	rand	R	ZAR
Switzerland	franc	SF	CHF
United Kingdom	pound	£	GBP
United States	dollar	US$	USD

Source: Van Marrewijk (2012), table 20.1

TABLE 13.2 Spot exchange rates on 3 December 2019 at 11:55:00 a.m. (UTC + 01:00)

Price of	*Bid spot rate*	*Ask spot rate*	*Currency*	*Country*	*Spread %*
USD1	1.32993	1.33007	CAD	Canada	0.0105
USD1	0.98960	0.98976	CHF	Switzerland	0.0162
USD1	14.66009	14.66686	ZAR	South Africa	0.0462

Source: www.oanda.com

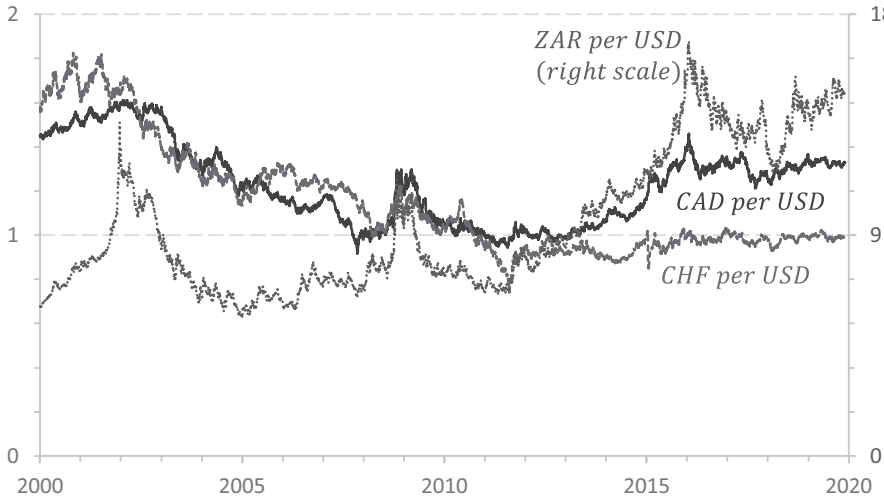
signals an important general property of exchange rates; they are *extremely variable*. The website from which the information was taken updates every five seconds. Real-time transactions are updated even more frequently. This makes exchange rates rather special prices, as the variability in the quoted prices is much higher than for those for goods and services traded in the marketplace (such as the price of diapers at the supermarket), although generally of the same order of magnitude as many other prices in financial markets.

Table 13.2 lists the exchange rate of the US dollar relative to three countries, namely Canada, Switzerland, and South Africa. There are actually two rates quoted: the *bid* rate – that is, the price at which banks are willing to buy USD1 (what they are bidding for USD1) –and the *ask* rate – that is, the price at which the banks are willing to sell USD1 (what they are asking to sell you USD1). These quotes are for large amounts only. The difference between the buying and selling rate is called the *spread*. It generates revenue for the currency-trading activities of the banks. In practice, the spread is quoted relative to the bid price. Therefore, on the basis of Table 13.2, a Swiss bank might quote USD0.98960–76, indicating the bank is willing to buy dollars at 0.98960 and willing to sell dollars at 0.98976. Obviously, banks from other countries can also buy and sell US dollars for Swiss francs: trading in these currencies is not limited to only Swiss banks and US banks. Note that the spread between the bid price and the ask price, the margin for the banks, is small. For the US dollar–Canadian dollar in our example, it is only 0.0105%. As shown in Table 13.2, the spread is slightly bigger for trade in the US dollar–Swiss franc (0.0162%) and substantially larger for trade in the US dollar–South African rand (0.0462%). In general, the spread decreases with the intensity with which the two currencies involved are traded. Since the spread is so small, we henceforth assume that the bid price is equal to the ask price (such that the spread is zero) and refer to the exchange rate of the US dollar in terms of Canadian dollars, Swiss francs, or South African rands. For financial trading, however, the spread is crucial.

Figure 13.1 illustrates the variability of exchange rates for a longer period (2000–2020) for the exchange rate of the US dollar in Canada, South Africa, and Switzerland using daily data. There are clearly big differences in the price of the US dollar over time and big differences in variability between countries. In Canada, for example, the US dollar exchange rate varied from a low of 0.9168 on 7 November 2007 to a 76% higher value of 1.6128 on 18 January 2002. In South Africa, the US dollar exchange rate varied from a low of 5.615 on 24 December 2004 to a value three times higher, 16.8845, on 20 January 2016.

Over the period as a whole, the US dollar *depreciated* relative to the Swiss franc, meaning that it has become less expensive for the Swiss to purchase US dollars. Initially, there was also a depreciation of the US dollar relative to the Canadian dollar, but that trend reversed to an *appreciation* (US dollar becomes more expensive) around 2008 and 2013, such that the net effect over a 20-year period is small. Relative to the South African rand, the US dollar has appreciated over this time, with large fluctuations over time and peaks in 2002, 2009, and 2016.

FIGURE 13.1 Swiss franc, Canadian dollar, and South African rand; daily data, 2000–2020



Source: www.federalreserve.gov

Note: CHF = Swiss franc; CAD = Canadian dollar; ZAR = South African rand (on right-hand-side vertical axis); exchange rates relative to US dollar

We have seen that exchange rates vary considerably over time, even within one day. The same is *not* true for the exchange rate at different locations for a given point in time. Since currencies are homogenous goods (a yen is a yen, no matter where it comes from) and the spreads are small, if the Japanese yen exchange rate were high in one location, say New York, and low in another location, say London, at the same point in time, traders could make a profit by (electronically) rapidly buying yen in London (where they are cheap) and selling them in New York (where they are dear). As a result of this *arbitrage* activity, the price of yen would rise in London and fall in New York. Profit opportunities exist until the price is equal in the two locations. In view of the small spreads, large funds swiftly move around the globe electronically, and the huge trading volume equality occurs almost instantaneously.

This holds not only for direct arbitrage for a particular exchange rate but also for so-called *triangular arbitrage* for different pairs of exchange rates – which is illustrated in Table 13.3. Suppose we know the price of one US dollar in terms of Canadian dollars (1.3300), Swiss francs (0.9897), and South African rands (14.6635). In view of arbitrage opportunities, this suffices to calculate all cross-exchange rates as given in Table 13.3. We know, for example, that one Swiss franc must cost 14.8164 South African rands, because 14.6635 rands are worth one US dollar, and one US dollar is worth 0.9897 Swiss francs, so one Swiss franc is worth148164 rands (14.6635 ÷ 0.9897 = 148164 rands). Similar treatment is given to the other table entries. Box 13.1 briefly discusses arbitrage in connection to Donald Trump's claims of Chinese currency manipulation in 2016.

TABLE 13.3 Cross-exchange rates; spot, 3 December 2019 at 11:55:00 a.m. (UTC + 01:00)

Price of 1	*(Country)*	*CAD*	*CHF*	*USD*	*ZAR*
CAD	(Canada)	1.0000	0.7441	0.7519	11.0252
CHF	(Switzerland)	1.3439	1.0000	1.0104	14.8164
USD	(United States)	1.3300	0.9897	1.0000	14.6635
ZAR	(South Africa)	0.0907	0.0675	0.0682	1.0000

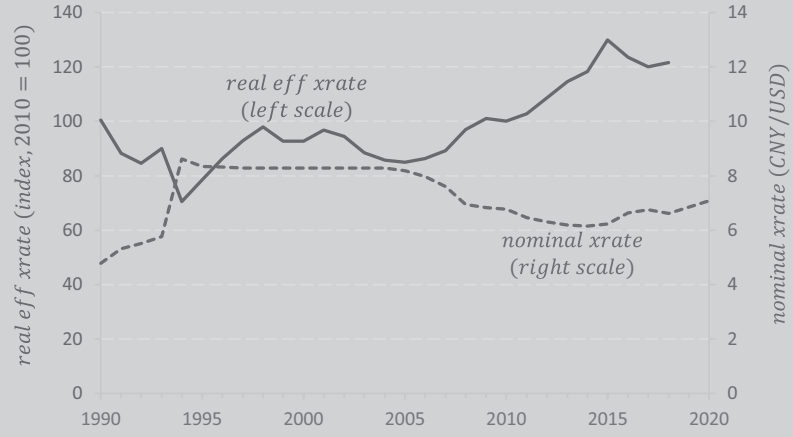
Source: See Table 13.2; for ISO code, see Table 13.1; it is based on av. bid & ask price of USD

BOX 13.1 China: arbitrage, real exchange rates, and currency manipulation?

Arbitrage ensures that goods cost the same in different countries if currencies reflect their real value. Suppose a hamburger costs USD4 in the US. If you exchange this to Chinese yuan at an exchange rate of CNY7 per USD, you receive CNY28 and should be able to buy a similar hamburger in China. If, instead, the hamburger costs CNY35 in China, the dollar is undervalued. Suppose S is the nominal spot exchange rate, P is the average price of US goods, and P^* is the average price of Chinese goods; then the *real* exchange rate RER can be defined as $RER = SP^*/P$. If the ratio is larger than 1, Chinese yuan are overvalued. If arbitrage works, the ratio should move towards 1. Since in practice nations trade with many countries, we apply the real exchange rate concept to all trading partners (using trade shares as weight) to determine the real *effective* exchange rate, which provides a summary of a currency's value relative to all trading partners.

Figure 13.2 depicts the nominal exchange of Chinese yuan relative to the US dollar, as well as the real effective exchange rate (index; 2010 =

FIGURE 13.2 Real effective exchange rate and nominal exchange rate; China, 1990–2020



Source: Created by using World Bank Development Indicators data

Notes: xrate = exchange rate; nominal = official rate

100) for the period 1990–2020. We can use it, for example, to evaluate Donald Trump's claim during the US presidential elections in 2016 that China is a currency manipulator.[3] If true, this suggests that China artificially influenced the value of the yuan to boost its competitive position, thus creating an undervalued currency. Note that the nominal dollar exchange rate rose sharply from about CNY4.8 to CNY8.6 in 1994 (a depreciation of the yuan) and then remained stable at about CNY8.3 for a long time, until 2004 (pegged to the US dollar), after which it started to decline to about CNY6.1 in 2014 (an appreciation of the yuan) and rise to CNY7.0 at the end of 2019 (a depreciation of the yuan).

The real effective exchange rate takes currency changes and price changes relative to all of China's trade partners into consideration. It was 100 by construction in 2010 and also in 1990. The latter might be taken as an 'equilibrium' year because China's current account balance switched from a deficit in 1989 to a surplus in 1990.[4] The real effective exchange rate is below 100 for the period 1991–2008 and has been rising substantially above 100 since then. Although we should not be too dramatic about minor deviations, if anything, this suggests that the Chinese yuan has been overvalued rather than undervalued since about 2013. Trump's claim of currency manipulation during the presidential election in 2016 was therefore not valid, although it might have been valid around 1994.

13.3 FORWARD-LOOKING MARKETS

The large variability of exchange rates illustrated in Figure 13.1 potentially poses problems for agents active on the foreign exchange market. Suppose, for example, that you represent a Japanese firm and have sold a thousand watches for delivery and payment in France in three months at a total price of €150,000. At the current exchange rate of ¥133.49 per euro, the payment of €150,000 is worth ¥20,023,500. Since the total cost of producing and delivering the watches for your company is about ¥19 million, you stand to make a profit of about ¥1 million on this transaction, so your boss will be pleased. However, payment (in euro) takes place only three months later. To your surprise and dismay, the euro turns out to have considerably depreciated relative to the Japanese yen in this period, such that three months later, the spot exchange rate for the euro is only ¥120.49. The payment of €150,000 is now worth only ¥18,051,000, which means that your company took a loss of about ¥1 million, rather than a profit of ¥1 million. Your boss will not be pleased.

Could you have avoided the ¥1 million loss? Yes, you could have, but it required you to take action three months earlier on a forward-looking market by using a forward-looking instrument. In this case, for example, you could have sold the €150,000 on the forward exchange market three months earlier at a then agreed-on forward price of, say, ¥131.24 per euro. This would have *guaranteed* you a revenue of ¥19,686,000 upon payment and ensured a profit

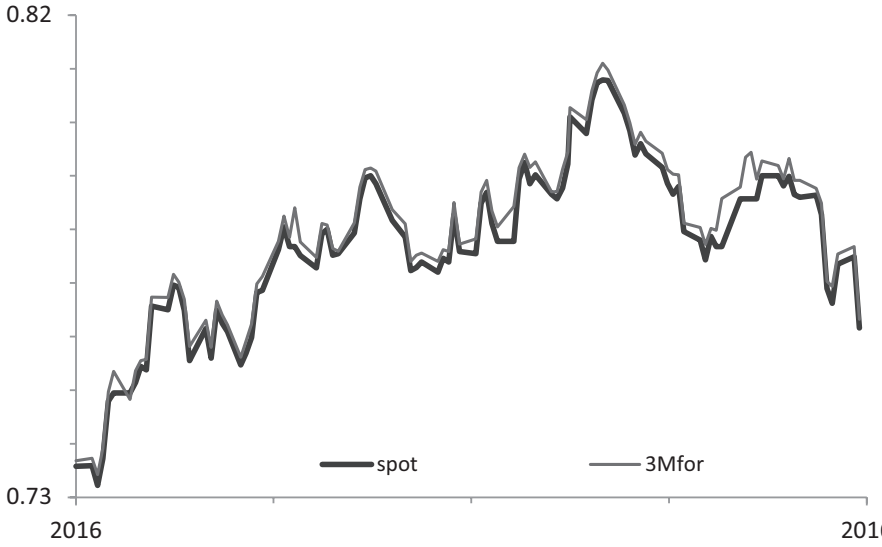
of about 700,000 Japanese yen. That is, you could have *hedged* your foreign exchange risk exposure on the forward exchange market.

Since many other economic agents face exposure to similar or opposite foreign exchange risks (which they would like to hedge too) and other economic agents would like to take a gamble (*speculate*) on the direction and size of changes in the exchange rate, many forward-looking markets have developed, accompanied by rather exotic terminology. We can distinguish, for example, between three so-called *plain vanilla* instruments, namely *forwards*, *swaps*, and *options*. According to the BIS (2002, p. 34), the term 'plain vanilla' refers to instruments that are 'traded in generally liquid markets according to more or less standard contracts and market conventions'. Combinations of the basic instruments can then be used to construct tailormade financial instruments, such as currency *swaptions* (options to enter into a currency swap contract).

The spot exchange rate is the price at which you can buy or sell a currency today. The forward exchange rate is the price at which you agree on today to buy or sell an amount of a currency at a specific date in the future.[5] A swap involves the *simultaneous* buying and selling of an amount of currency at some point in the future and a *reverse* transaction at another point in the future. A currency swap applies this to a stream of profits. Finally, an *option* gives you the right to buy or sell a currency at a given price during a given period.

Figure 13.3 illustrates the movement of the spot rate and the three-month forward exchange rate of the British pound relative to the euro

FIGURE 13.3 British pound to euro spot and three-month forward exchange rates, 2016



Source: Based on Datastream data

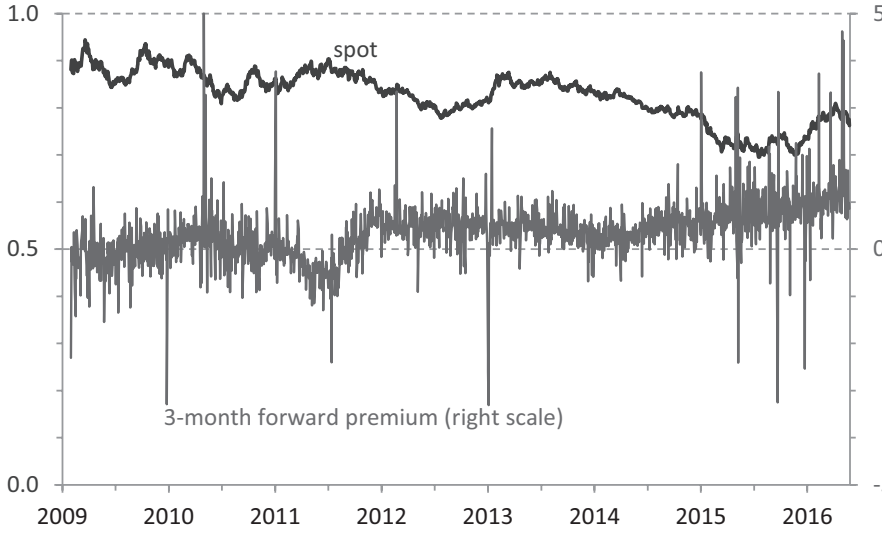
Note: daily data from 1 January to 24 May 2016 (average rates); 3Mfor is short for three-month forward rate; vertical scale does not start at zero

from 1 January to 24 May 2016 (the figure depicts the price of €1 in British pounds). Obviously, the forward rate and the spot rate move, in general, quite closely together (note that the scale on the vertical axis does not start at zero). Over the period 2009–2016, the forward rate of the euro was mostly higher than the spot rate (about 77% of the time): the euro was selling at a *premium*. If the opposite holds – that is, if the forward rate is below the spot rate – then the currency is said to be selling at a *discount*. The existence of a forward premium is driven by an expected appreciation of the currency, while a forward discount is driven by an expected depreciation of the currency. To get a better (and comparable) view of the degree to which the euro was selling at a premium or a discount in this period, we can calculate the annualized forward premium for different maturities. Let S denote the spot exchange rate, let F denote the forward rate, and let the duration be measured in months:

$$forward\ premium\,|_{annual,\%} = \frac{(F-S)/S}{duration/12} \tag{13.1}$$

Figure 13.4 illustrates the forward premium for the three-month forward rate since 2009 (right-hand scale) as well as the spot rate of the euro (left-hand scale). It shows that the changes from one period to the next can be quite large and that the predicted percentage change of appreciation or depreciation (as measured by the forward premium) can be substantial (almost +10%, such as on 30 April 2010, which is clearly outside the scale in the figure).

FIGURE 13.4 British pound to euro spot rate and three-month forward premium, 2009–2016



Source: Based on Datastream data

Note: daily data from 1 January 2009 to 24 May 2016 (average rates); three-month forward premium annualized, in percentages

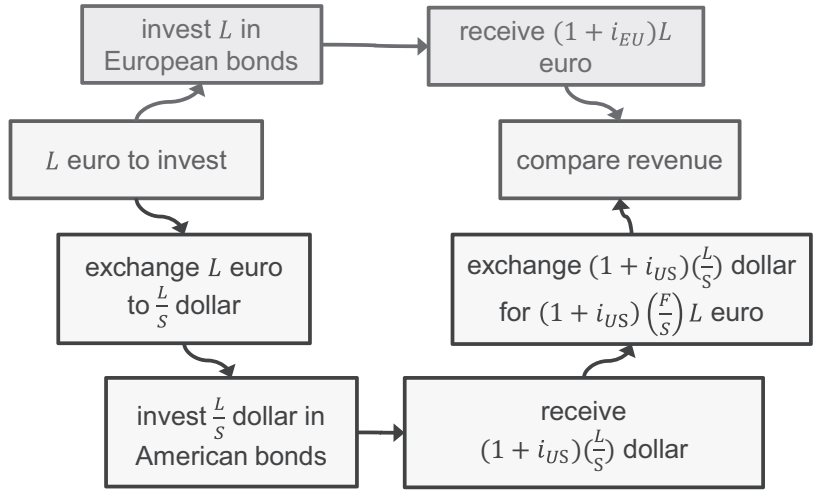
13.4 INTEREST RATE PARITY

When you have a large sum of money to invest, you are interested in the return on your investment from different opportunities. When these opportunities are located in different countries, the exchange rate plays an important role in determining where to invest. This evaluation leads to the interest rate parity condition, which is crucial for international money markets. There are two types of interest rate parity conditions: covered and uncovered. We start with the former and then discuss the latter.

Suppose you live in Europe and want to invest in government bonds. For simplicity, we consider just two options: European bonds and US bonds. We assume that the two assets are *perfect substitutes*, implying in particular that there is no difference in perceived riskiness of one asset relative to the other. You have a large sum L of euros to invest for one period and care only about the return in euros. Figure 13.5 shows two possible investment options.

- Option 1: you can purchase a European bond. If the European interest rate is equal to i_{EU}, you will receive $(1 + i_{EU})L$ euros by the end of the period.
- Option 2: you can purchase a US bond. Since these are denominated in dollars, you will have to be active on the foreign exchange market – first by exchanging your L euros on the spot market for L/S US dollars, where S is the spot exchange rate of the US dollar (its price in euros) and second by investing these L/S dollars in US bonds. If the American interest rate is equal to i_{US}, you will receive $(1 + i_{US})$ (L/S) dollars by the end of the period. You are, however, not interested in the return in dollars, but only in the return in euros, so you will have to convert these dollars at the end of the period back to euros. This

FIGURE 13.5 Two investment options



poses a problem because at the moment you are making your investment decision (option 1 or option 2), you do not yet know what the future spot exchange rate of the dollar is going to be. This is where the forward exchange market provides a solution. Since you know exactly how many dollars you will receive one time period from now if you choose option 2 (namely $(1 + i_{US})$ (L/S) dollars), you will also know exactly how many euros you will receive if you sell these dollars before making your investment decision at the forward exchange rate, F, on the forward exchange market, namely $(1 + i_{US})$ (F/S) euros.

In short, you know exactly the return to your investment if you choose option 1 and the return to your investment if you choose option 2. Obviously, many other economic agents make similar calculations as you do (possibly trying to benefit from arbitrage opportunities), and all of you will invest in the asset with the highest return. If the two assets are perfect substitutes and both are held in equilibrium, the return to the two assets must therefore be the same to ensure that the market does not prefer one asset over the other – that is, we have the following equilibrium condition:

$$\frac{F(1+i_{US})}{S} L = (1+i_{EU}) L \;\Rightarrow\; \frac{F}{S} = \frac{1+i_{EU}}{1+i_{US}} \tag{13.2}$$

Obviously, the time frame for equation 13.2 must be consistent, so if F is, for example, the three-month forward rate, then i_{ES} and i_{US} must be three-month interest rates. Except for interest rates, we will use the convention that lowercase letters refer to the natural logarithm of uppercase letters. The second equality of the condition of equation 13.2 can be written more tersely by taking the natural logarithm and using the approximation. In $(1 + X) \approx X$ (where the symbol ≈ should be read as 'is approximately equal to'),

$$f - s \approx i_{EU} - i_{US}. \tag{13.3}$$

Equation 13.3 states that the logarithmic difference between the forward rate and the spot rate must be equal to the difference between the domestic interest rate and the foreign interest rate. It is known as the *covered interest parity condition*, because you have fully covered your return in foreign currency on the forward exchange market. It provides a powerful and crucial empirical relationship between interest rates and (spot and forward) exchange rates in international money and finance analysis.

Under the given circumstances, there are more options available to you. One of these options (called option 3) is *not* to hedge your risk on the forward exchange market. For clarity of exposition, it is better to now explicitly add a subindex, t, to denote time. Let us compare your revenue from option 1 – that is, buy the European bond – with the revenue from option 3: buy the US bond and do not hedge on the forward exchange market. Nothing has changed for option 1, so the following is true:

- Revenue from buying European bond – $(1 + i_{EU,t})$ L

Before you can purchase the US bond, you have to convert your euros to dollars at the exchange rate, S_t, which will give you L/S_t dollars. In the next period, your revenue will therefore be $(1 + i_{US,t})$ (L/S_t) dollars. You have decided not to hedge your foreign exchange risk, so in the next period, you will have to exchange your currency on the spot exchange market. In this period, when you have to make your investment decision, you obviously do not know the next period's spot exchange rate. To make your decision, you will therefore have to form some expectation today about the future spot exchange rate. This can be a simple (single number) or a complicated (distribution function) expectation. Let us denote the expected value of your forecasting process by S^e_{t+1}. Then we conclude the following:

- *Expected* revenue from buying US bond – $\dfrac{S^e_{t+1}(1+i_{US,t})}{S_t} L$

We cannot draw immediate conclusions from comparing these two revenues, because you know the return to investing in the European bond for sure, whereas the return to investing in the US bond is uncertain. Only under the additional assumption of *risk neutral* economic agents, hypothesizing that agents focus onlyon the expected value of the return and do not care at all about the underlying distribution of risk, should the sure return to the European bond be equal to the expected return of the US bond. Under that assumption, and after a similar logarithmic transformation and approximation as discussed earlier, we arrive at the *uncovered interest parity condition*:

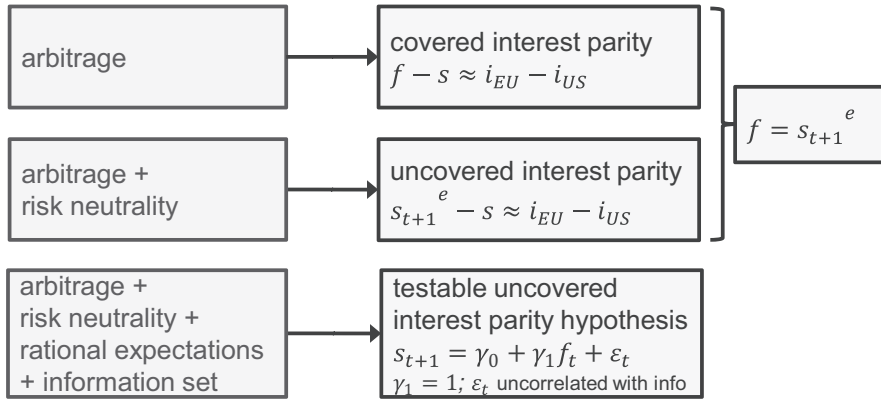
$$S^e_{t+1} - S_t \approx i_{EU,t} - i_{US,t} \tag{13.4}$$

Equation 13.4 says that the difference between home interest rates and foreign interest rates must be equal to the expected appreciation of the foreign currency. Thus, the equation is pretty useless for empirical testing because it contains the expectation of the future exchange rate, and expectations cannot be directly measured.[6] Alternatively, you can view it as a simple method to define these expectations under the assumption of risk neutrality. In combination with the covered interest parity condition 13.3, however, it is trivial to see that the forward exchange rate should be equal to the expected value of the future spot exchange rate:

$$f = S^e_{t+1} \tag{13.5}$$

Equation 13.5 still does not give us a testable hypothesis, unless we are willing to go one step further, namely by assuming *rational expectations*. Under rational expectations, economic agents make no systematic forecast errors. They will, of course, not be able to exactly predict the future exchange rate, but their prediction should reflect all information available to them at the time they are making the prediction. Any forecast errors must therefore be uncorrelated with (i.e. not systematically related to) the information set available at the time of the prediction. Under the additional assumption of rational expectations, the uncovered interest parity condition can therefore

FIGURE 13.6 Assumptions, interest parity, and market efficiency



be tested by estimating a regression similar to the following (see Frenkel, 1976):[7]

$$S_{t+1} = \gamma_0 + \gamma_1 f_t + \varepsilon_t \tag{13.6}$$

Here ε_t is the (forecast) error term. Under the hypothesis of risk neutrality and rational expectations, we expect the parameter γ_1 to be equal to unity and the forecast error to be uncorrelated with the information available at time t. Empirical estimates of equations like 13.6 are frequently called tests of *market efficiency*. There are different types of market efficiency, where the joint hypothesis of risk neutrality and rational expectations is dubbed the simple efficiency hypothesis by Sarno and Taylor (2002, p. 10). Figure 13.6 schematically summarizes our discussion. Box 13.2 illustrates some of the economic and financial connections associated with interest rates, inflation, currencies, capital controls, and economic growth for Argentina.

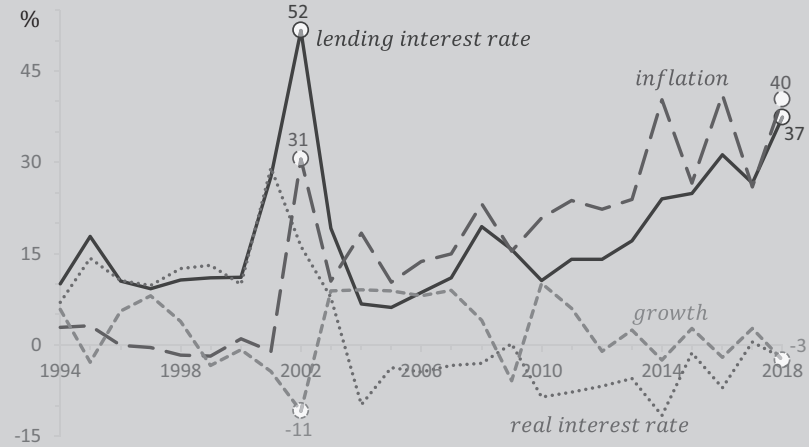
BOX 13.2 Argentina: interest rates, inflation, and capital controls

Inflation rates in Argentina have been high in the 20th century. The *average* inflation rate in the period 1975–1990, for example, was about 550% *per year*, which implies that prices rise by about 40% per month.[8] The peak of inflation in 1989 was at more than 3,000%. As Figure 13.7 illustrates, after a period of free market reform and privatization, the inflation rate became low or negative until 2001 and combined with an exacerbating economic crisis starting in 1998, eventually leading to a large contraction of about 11% in 2002. A series of deposit runs forced the Argentinian authorities to impose a deposit freeze (capital controls) in December 2001, combined with partial default and abandoning convertibility. The Argentinian peso lost most of its value, and in 2002, inflation rose to 31% and the interest rate to 52%, while unemployment rose sharply. Economic growth returned under the guidance of Roberto Lavagna (minister of the economy), who moderated inflation and stabilized the exchange rate, with the help of a commodity price boom. Under the

Kirchner presidencies (first Néstor and then his wife, Cristina Fernández) inflation rates crawled back up despite price and capital controls, with a slowdown of the economy and a second default in 2014.

On the basis of this legacy, Mauricio Macri became president in 2015, released exchange restrictions, and lifted price and capital controls. The subsequent rise in inflation rate was accompanied by rising interest rates (to 40% and 37% in 2018, respectively). Despite negative real interest rates, economic growth was halted and turned negative (-3%) in

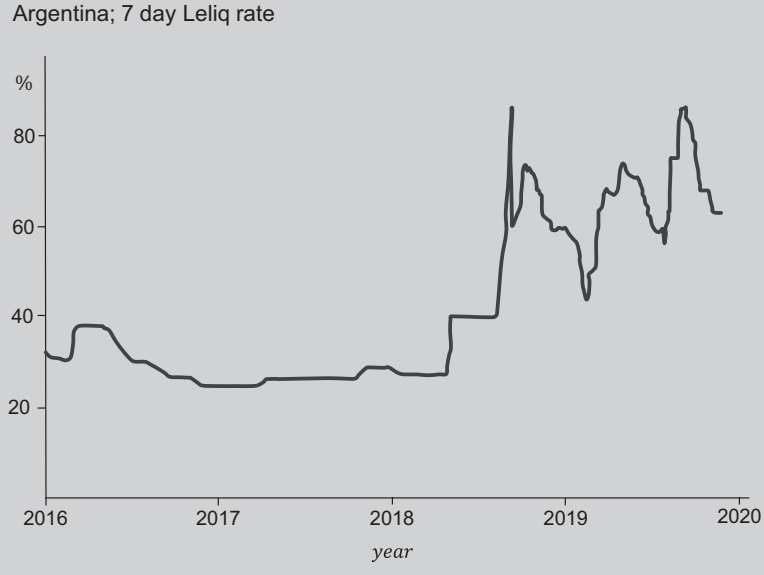
FIGURE 13.7 Argentina: interest rates, growth, and inflation; percent, 1994–2018



Source: Created by using World Development Indicators data

Note: inflation is GDP deflator; growth is GDP growth

FIGURE 13.8 Argentina reference interest rate; 7-Day Leliq Rate, 2016 2020



Source: Created by using Central Bank of Argentina data (tradingeconomics.com)

2018. As the interest rate developments since then (see Figure 13.8) show, the situation became unstable in August 2018 (see the *Economist*, 2018). The peso depreciated sharply as financial markets started to worry that the government would struggle to refinance its debt and get re-elected in view of the required high interest rates to attract creditors that might repel voters. These worries became reality in October 2019, when Alberto Fernandez rather than Maurizio Macri, was elected. Interest rates rose sharply as Argentina tightened capital controls (reintroduced in September 2019) substantially: savers can buy only USD200 per month, rather than USD2,000 per month (Do Rosario & Millan, 2019).

13.5 THE POLICY TRILEMMA

In theory, we can distinguish between two types of exchange rate regimes: *fixed* exchange rates and *flexible* exchange rates. In practice, there is a sliding scale (with associated colourful typology) from one hypothetical extreme to the other. As the names suggest, the difference between fixed exchange rates and flexible exchange rates is the extent to which the exchange rate is allowed to change, in response to market pressure. Under fixed exchange rates, the central bank of a country has set the exchange rate at a particular level, and it will not allow the currency to appreciate or depreciate relative to that level. To maintain the fixed exchange rate, the central bank must be ready to intervene in the foreign exchange market by buying or selling reserves or by increasing or decreasing the interest rate (see van Marrewijk, 2012). Under flexible exchange rates, the central bank does not intervene in the foreign exchange market and allows the currency to freely appreciate or depreciate in response to changes in market supply and demand.

The history of the international economic order on exchange rate regimes and capital market integration is closely connected; on this, see Mundell (1968), Eichengreen (1996), and Obstfeld and Taylor (2003). To better explain this connection, we distinguish between three possible policy objectives that a nation might try to achieve:[9]

1 Monetary policy independence.
2 A fixed exchange rate.
3 International capital mobility.

The first objective is desirable in that it allows a country to determine its monetary policy independently of other countries, on the basis of its own economic circumstances. The second objective is desirable in that it provides price stability for international transactions and a clear point of reference. The third objective is desirable in that it allows for the spreading of investment risks and access to the most profitable projects internationally.

It turns out that only two of these three policy objectives can be achieved at any one point in time, at the expense of the third objective. Focusing on the EU and the US, this can be illustrated most effectively by

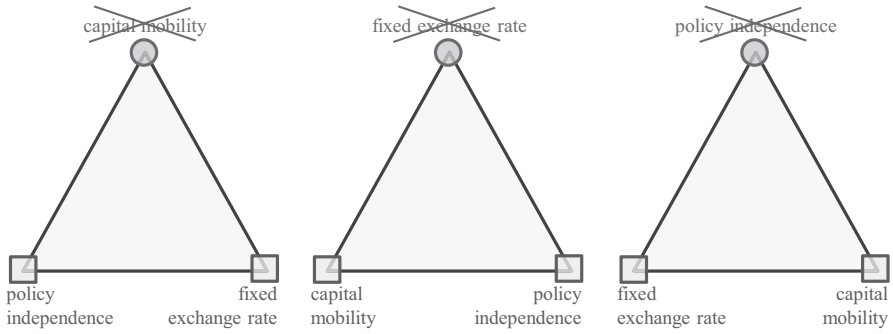
recalling the uncovered interest rate parity condition with transaction costs (using a zero-risk premium; see equation 13.7):

$$i_{EU,t} = i_{US,t} + (S^e_{t+1} - S_t) + transaction\,costs, \tag{13.7}$$

where the subindex t denotes time, $i_{EU,t}$ is the EU interest rate, $i_{US,t}$ is the US interest rate, S_t is the (log) US dollar exchange rate (price of USD1 in terms of euros), and S^e_{t+1} is the (log) expected value of the next period's US dollar exchange rate.

If there is complete international capital mobility (objective 3 holds), the transaction costs are low, such that equation 13.7 reduces to the uncovered interest parity condition itself: $i_{EU,t} = i_{US,t} + (S^e_{t+1} - S_t)$. This implies that expected changes in the exchange rate are the only reason for an interest rate differential between the EU and the US. With full international capital mobility, policymakers must therefore *choose* between monetary policy independence (reaching objective 1, as measured by a possible deviation between EU interest rates and US interest rates) and a fixed exchange rate (reaching objective 2). If, for example, they decide to fix the exchange rate (such that $S^e_{t+1} - S_t = 0$), this automatically implies $i_{EU,t} = i_{US,t}$, making monetary policy independence impossible. Similarly, if they decide to strive for monetary policy independence, this automatically makes a fixed exchange rate impossible, since $S^e_{t+1} \neq S_t$ when $i_{EU,t} \neq i_{US,t}$. The only way that objectives 1 and 2 can be achieved simultaneously is by giving up objective 3, in which case equation 13.7 with fixed exchange rates reduces to $i_{EU,t} = i_{US,t} + transaction\,costs$. A country can then steer its own interest rate (retain policy autonomy) and have a fixed exchange rate at the cost of immobile capital, which prevents portfolio investors from directing capital flows to or from the EU so as to benefit from the interest rate differential. Although intermediate solutions are possible for monetary policy independence and capital controls (some capital controls buy you some monetary independence; see also Table 13.4), this does not hold for fixed exchange rates. Figure 13.9 illustrates how satisfying two policy objectives (squares) necessarily implies sacrificing the third policy objective (circle).

FIGURE 13.9 The policy trilemma



The incompatibility between objectives 1–3 was pointed out by Nobel laureate Robert Mundell in the early 1960s. It is called the *incompatible trinity*, *incompatible triangle*, or *policy trilemma* and provides us with a categorization scheme that helps us to understand changes in the international economic order over time. Figure 13.9 illustrates the trilemma. In each triangle of the figure, the two squares indicate the objectives pursued by the government, whereas the circle at the top of the triangle indicates the policy objective that cannot be met. The trilemma indicates that there is a price to pay for policymakers when they want to achieve full capital mobility, fixed exchange rates, or policy autonomy. Box 13.2 illustrates the connections for a real-world case, such as Argentina.

13.6 EXCHANGE RATE POLICY

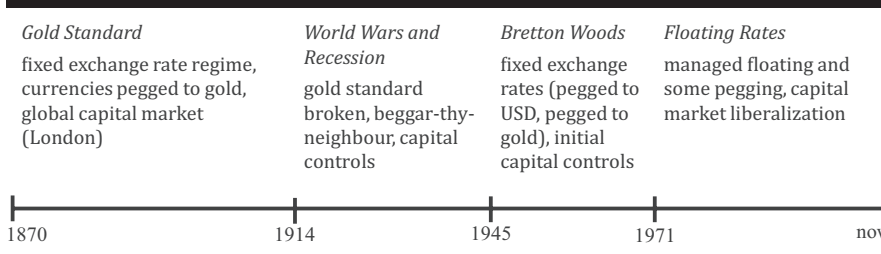
We now briefly explain how the choices have changed over time by focusing on the most recent main international monetary regimes; see also Eichengreen (1996) and Obstfeld and Taylor (2003).[10] Figure 13.10 overviews these regimes, their duration, and the main characteristics:

- Gold standard (±1870–1914)
- World wars and recession (1914–1945)
- Bretton Woods (1945–1971)
- Floating rates (1971–present)

13.6.1 Gold standard (±1870–1914)

Towards the end of the 19th century, when the United Kingdom was the world's leading economy and London the undisputed global financial centre, an increasing share of the world economy moved to the gold standard. This was a stable and credible fixed exchange rate regime in which countries valued their currency in terms of gold. It started in Britain in 1844, when the Bank Charter Act established that Bank of England notes, fully backed by gold, were the legal standard. It became an international standard in 1871, when Germany established the mark on a strict gold standard, soon followed by many other European nations and eventually by Japan (1897), India (1898), and the US (1900). With countries' issuing bank notes directly backed by gold and by allowing gold to be freely

FIGURE 13.10 Overview of international monetary regimes



imported and exported across borders according to the gold standard rules, the exchange rates between the currencies became fixed. Suppose, for example, that the Federal Reserve pegs the price of gold at $35 per ounce and the Bank of England at £7, then the exchange rate of the British Pound in terms of US dollars must be 35/7 = 5; otherwise, profitable arbitrage opportunities arise. In practice, by taking the costs of shipping and insuring gold in transit into consideration, the exchange rates could fluctuate within narrow margins called *gold points*. The gold standard functioned as a disciplining device for countries, which led to a convergence of interest rates and a global capital market centred in London, in exchange for a reduction in policy autonomy.

The gold standard worked quite well at the end of the 19th century and the beginning of the 20th century, but there are also several drawbacks to the gold standard. First, although currency backed by gold generally leads to relatively stable prices, the rate of inflation is determined not only by macroeconomic conditions but also by the random discoveries of new gold supplies. There have been considerable fluctuations linked to these events; see Cooper (1982). Second, the international payments system requires gold as reserves. As economies are growing, central banks strive for an increase in the buffer stock of their gold reserves (otherwise, there would be deflation). Simultaneous competition for gold by central banks might bring about unemployment through a reduction in their money supply. Third, the gold standard gives countries with a large gold supply, such as Russia and South Africa, the ability to influence the world's macroeconomic conditions by selling gold. Fourth, and perhaps most importantly, the gold standard puts undue restrictions on the use of monetary policy as a means of fighting unemployment under special circumstances, such as a worldwide recession (this is true for any fixed exchange rate regime).

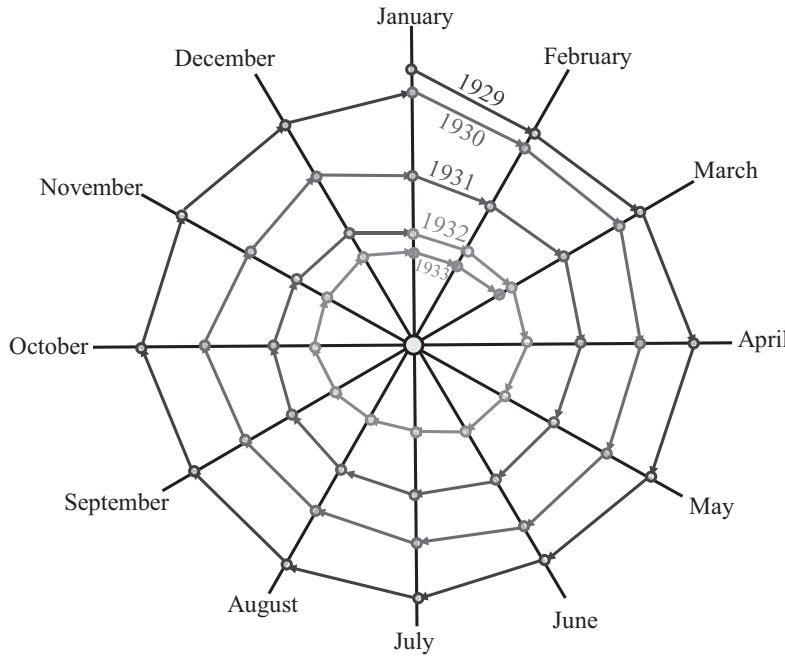
13.6.2 World wars and recession (1914–1945)

The pillars of the international economic system – the gold standard, multilateral trade, and the interchangeability of currencies – crumbled down one by one during the First World War (1914–1918), the Second World War (1939–1945), and particularly during the Great Depression, which started in October 1929 and lasted throughout the 1930s. To finance its war efforts, Britain ended the convertibility of Bank of England notes in 1914. Nations printed more money than could be redeemed in gold, hoping to win the First World War and redeem the excess out of reparations payments. Losing the war, Germany was required by the Treaty of Versailles to pay large punitive damages, of which in the end it could only effectively transfer a fraction; see Brakman and Van Marrewijk (1998, ch. 1). To deal with these difficulties, the Bank for International Settlements was established in 1930 under the Young Plan. Many nations, including the US and the UK, instituted capital controls to prevent the movement of gold. Britain returned to the gold standard at the prewar gold price in 1925, which entailed a significant deflation for the economy, much to the dismay of British economist John Maynard Keynes, who called the gold standard a 'barbarous relic'.

The credibility of the gold standard was broken by the First World War, such that countries were no longer willing to give up their policy autonomy for a well-functioning international economic system, focusing instead on domestic political goals. Consequently, when the Great Depression hit in 1929, many countries engaged in noncooperative, competitive beggar-thy-neighbour devaluations and instituted capital controls. This greatly exacerbated the crisis, caused the international trade system to collapse and put millions of people out of a job, with unemployment rates of more than 30%. Both the punitive damages required from Germany in the Treaty of Versailles and the economic consequences of the nationalistic policies imposed during the Great Depression are seen as major contributing factors in causing the outbreak of the Second World War. While the war was raging, politicians and advisors started to work on a plan to prevent this from happening again.

During the Great Depression in the 1930s, the beggar-thy-neighbour policies, in which each country tried to transfer its economic problems to other countries by depreciating its own currency and imposing high tariffs (e.g., see the Hawley–Smoot Act of the US in 1930), led to an almost complete collapse of the international trade system, further exacerbating and prolonging the economic crisis. The impact of the beggar-thy-neighbour policies on international trade is aptly illustrated by the 'spider web spiral', measuring the size of world imports in each month by the distance to the origin; see Figure 13.11. In a period of only four years, world trade

FIGURE 13.11 Spider web spiral: world imports in millions US gold dollar, 1929–1933



Source: League of Nations (1933)

Note: Values in January (1929–1933) – 2,998; 2,739; 1,839; 1,206; and 992 respectively

flows dropped to one-third of their previous level (from January 1929 to January 1933, world imports fell from 2,998 to 992 million US gold dollars per month).

13.6.3 Bretton Woods (1945–1971)

The foundations for a new international economic order were laid at the Mount Washington hotel in Bretton Woods, New Hampshire, when the delegates of 44 allied nations signed the Bretton Woods Agreement in July 1944. The delegates set up a system of rules, institutions, and procedures and established the International Monetary Fund and the World Bank. Planning for the new order had been underway some three years since US President Franklin Roosevelt and UK Prime Minister Winston Churchill signed the Atlantic Charter in August 1941. There was no question towards the end of the Second World War that the balance of power had shifted towards the United States, politically, economically, and militarily. This meant that although there was some compromise towards the UK plan designed by John Maynard Keynes, the structure of the Bretton Woods system was based on the plans designed by US-American Harry Dexter White, who would remain a powerful initial influence at the IMF as the first US executive director.

The pillar of the US vision for the postwar economic order was free trade and a prevention of beggar-thy-neighbour policies. William Clayton, the assistant secretary of state for economic affairs, apparently summed up this point: 'we need markets – big markets – around the world in which to buy and sell'. Free trade involved lowering tariffs and other trade barriers, a task for the General Agreement on Tariffs and Trade and World Trade Organization, and a stable international monetary system to foster the development of trade and capital flows. To do this, the gold standard was re-established indirectly through the role of the US dollar as international reserve currency. The US government fixed the price of gold at USD35 per ounce and made a commitment to convert dollars to gold at that price (for foreign governments and central banks). In conjunction with the strength of the US economy, this made dollars even better than gold as international reserves, since dollars earned interest and gold did not. Other countries pegged their currency to the US dollar at a *par value* and would buy and sell dollars to keep exchange rates within a *band* of plus or minus 1% of parity. To avoid the beggar-thy-neighbour devaluation problem, member countries could change their par value only with IMF approval, which required a decision by the IMF that the balance of payments was in 'fundamental disequilibrium'. A decrease in the value of a currency was called a *devaluation*, an increase a *revaluation*. This terminology still holds for all fixed exchange rate regimes. For floating regimes, we use *appreciation* and *depreciation* respectively.

13.6.4 Floating rates (1971–present)

Increasing pressure on the Bretton Woods system during the 1960s and early 1970s caused its collapse. Massive sales of gold by the Federal Reserve and

European central banks led to the instalment of a two-tier gold market on 17 March 1968. Private traders could buy and sell gold at a price determined by market forces on the London gold market, while central banks would continue to transact with one another at the (lower) official gold price of USD35 per ounce. The latter was used only to a limited amount. Speculation against the dollar forced the German Bundesbank to purchase USD1 billion during a single day on 4 May 1971, and another USD1 billion during the first hour of the next trading day alone; see Krugman and Obstfeld (2003, p. 560). Germany gave up and allowed the mark to float. It became clear that the dollar had to be devalued. This was, however, difficult under the Bretton Woods system, because it implied that all other currencies, which were pegged to the dollar, had to be revalued with approval from the IMF and all other countries, many of whom were reluctant to do so. Richard Nixon, the then US president, forced the issue on 15 August 1971 by formally ending the convertibility of US dollars to gold and imposing a 10% tax on all imports into the US until an agreement had been reached. Although this *Smithsonian Agreement* to devalue the dollar by about 8% came in December of 1971 (at the Smithsonian Institution in Washington, DC), it was unable to save the Bretton Woods system. After renewed speculative attacks, there was another 10% devaluation of the dollar on 12 February 1973, followed by a decision of a floating exchange rate of the US dollar relative to the most important international currencies on 19 March 1973.

Table 13.4 summarizes the policy choices made by most countries concerning the policy trilemma explained in section 13.5 for each of the four most recent international monetary systems. During the gold standard, there was a broad consensus to give up on policy autonomy in exchange for capital mobility and maintaining fixed exchange rates. This broke down during the world wars and recession era, as most countries pursued activist monetary policies to try to solve domestic problems at the cost of either imposing large capital controls or giving up on fixed exchange rates. In the Bretton Woods era, there was again broad consensus to maintain fixed

TABLE 13.4 The policy trilemma and the international economic order

	Resolution of trilemma – countries choose to sacrifice:			
Era	policy autonomy	capital mobility	fixed exchange rate	notes
Gold standard	most	few	few	broad consensus
World wars and recession	few	several	most	capital controls especially in Central Europe, Latin America
Bretton Woods	few	most	few	broad consensus
Floating rates	few	few	many	some consensus; currency boards, dollarization, etc.

Source: Obstfeld and Taylor (2003)

exchange rates, this time by sacrificing capital mobility (which was limited directly after the Second World War and then gradually increased). With regard to the floating rates era, Table 13.5 depicts the more recent policy choices as they have evolved over time, in which many countries have been willing to give up on fixed exchange rates in return for policy autonomy and capital mobility.

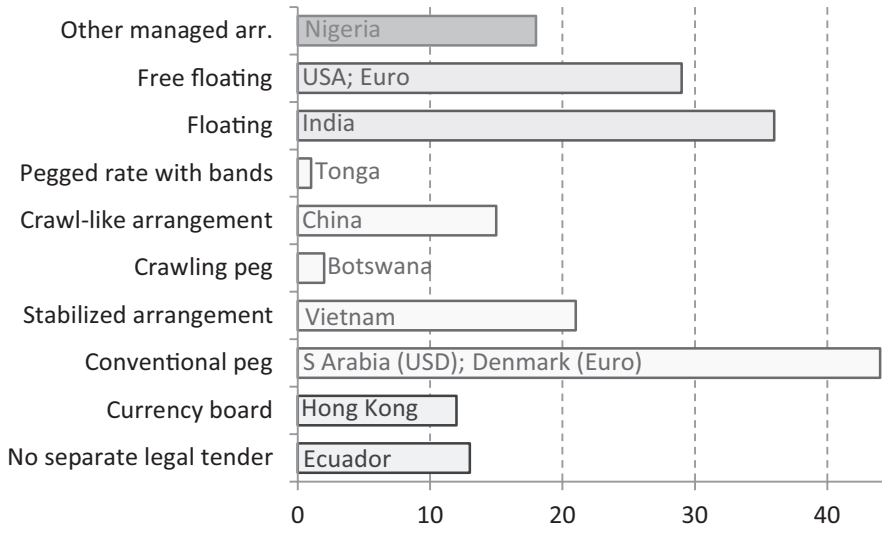
TABLE 13.5 IMF exchange rate classification system

Hard pegs		
	No separate legal tender	*The currency of another country circulates as the sole legal tender (formal dollarization).*
	Currency board arrangements	A monetary regime based on an explicit commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate. The domestic currency will be issued only against (fully backed) foreign exchange.
Soft pegs		
	Conventional pegged arrangement	The country formally (de jure) pegs its currency at a fixed rate to another currency or a basket of currencies. The exchange rate may fluctuate within narrow margins.
	Stabilized arrangement	A spot market exchange rate that remains within a margin of 2% (except for outliers) for six months or more and is not floating.
	Crawling peg	The currency is adjusted in small amounts at a fixed rate or in response to changes in selected indicators.
	Crawl-like arrangement	The exchange rate remains in a narrow margin of 2% relative to a statistically identified trend for six months or more and is not floating.
	Pegged exchange rate within horizontal bands	The exchange rate is maintained within margins of at least +1% around a central rate.
Floating arrangements		
	Floating	The exchange rate is largely market determined, without an ascertainable or predictable path for the rate.
	Free floating	Exchange rate intervention occurs only exceptionally and aims to address disorderly market conditions.
Residual		
	Other managed arrangement	A residual category if the exchange rate regime does not meet the criteria of any of the other categories.

Source: IMF (2014, Table 13.1) and Habermeier et al. (2009)

Note: System used since 2009

FIGURE 13.12 De facto exchange rate arrangements; 30 April 2014



Source: IMF (2014, Table 2)

Note: # of countries; selected countries for each regime; see also Table 13.5

13.6.5 Current exchange rate regimes

Although the present international monetary system is called the floating rates era, this does not mean that all currencies are freely determined by market forces. On the contrary, almost all countries at some time or another engage in some type of foreign exchange market intervention, through either their legal framework, direct intervention, or interest rate policy. As summarized in Table 13.5, the IMF currently identifies ten exchange rate regimes. Figure 13.12 shows the number of countries in each of the ten categories as identified on April 2014, with some selected countries in each category for illustration purposes. It indicates that many countries have opted for a floating or free-floating arrangement, whereas many other countries are engaged in various forms of fixed and managed exchange rate regimes.

13.7 TRADE FINANCE

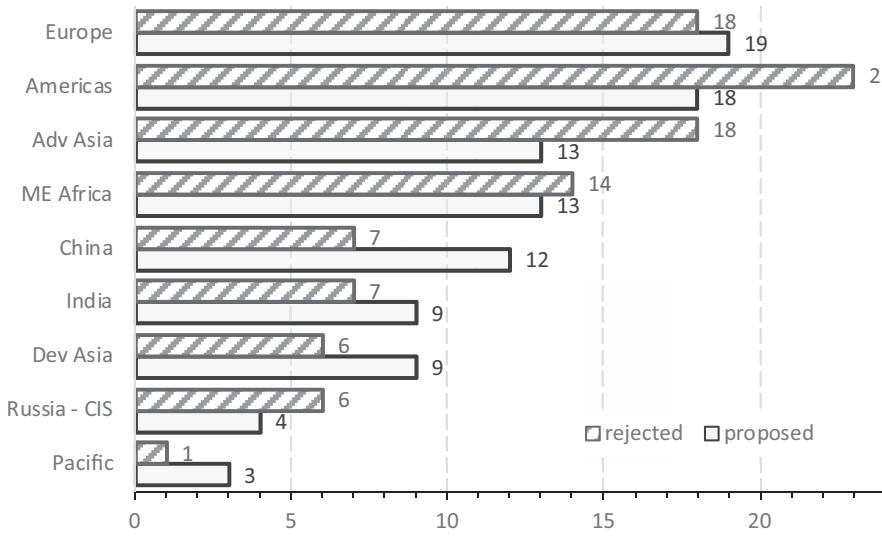
Compared to domestic trade, cross-border trade activities are riskier, which raises costs as firms learn about foreign markets, regulations, and product customization; see Foley and Manova (2015). In addition, traders experience a longer delay between production and payment, while banks screen traders more carefully, which raises the costs of credit; see Ahn, Amiti, and Weinstein (2011). Trade finance is credit (including open-account, cash-in-advance, and bank-intermediated instruments) that banks offer to firms to facilitate global trade. The payment contract is influenced by export market and import market characteristics, costs, timing, and default risk. As a result of the foregoing properties, trade finance has characteristics that differ from other types of

credit; see DiCaprio and Yao (2017). These characteristics include short tenor (the amount of time left for repayment or until a contract expires), availability (not all banks have the expertise to offer trade finance), and stability (the first line of credit to be pulled in case of a liquidity shortage).

Historically, attention to difficulties that traders encounter when they want to finance their activities rises in times of a credit crunch (such as the Great Recession, which started in 2008) as a way to explain the exacerbation of a crisis since banks transfer the shock (their shortage of funds) to their borrowers (credit rationing). In contrast, since 2013 the Asian Development Bank (ADB) has been collecting information on trade finance difficulties during regular times as an obstacle in the development process. These efforts now seem to lead to a twice annual *Trade Finance Gaps, Growth and Jobs Survey*, which we use as our source of information for this section. It is suitable that the ADB became active in this area since the dominant bank-intermediated trade finance instruments are letters of credit, for which Asia Pacific is by far the dominant region; see DiCaprio and Yao (2017).

The global regional distribution of proposed and rejected trade finance transactions is reasonably stable and depicted for 2017 in Figure 13.13. Ordered by proposed transactions, Europe is the largest region (1%), followed by the Americas (North and South, 18%). At the continent level, Asia is dominant (close to 50%), but in the figure, it is subdivided into many subregions (advanced Asia, developing Asia, China, and India), while the Middle East is combined with Africa. Relative to their share in proposed

FIGURE 13.13 Proposed and rejected trade finance transactions; by region (%), 2017



Source: Created by using ADB (2017) data

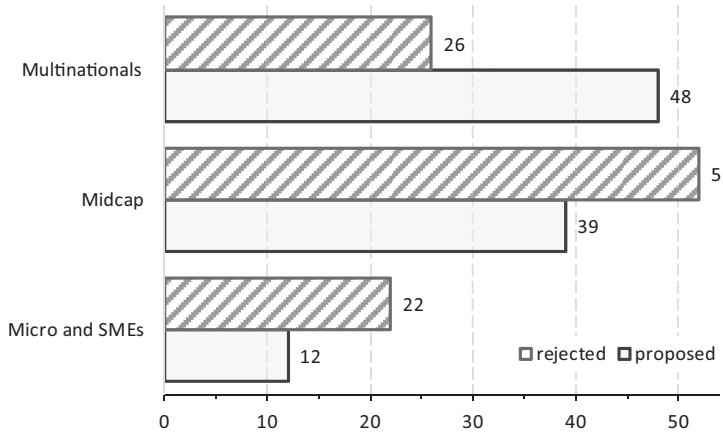
Note: Adv Asia = Advanced Asia (Hong Kong, Japan, S. Korea, and Singapore); ME = Middle East; Dev Asia = Developing Asia, excl. China and India; CIS = Commonwealth of Independent States (Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Armenia, Moldova, Russia, Tajikistan, and Uzbekistan)

transactions, the share of rejected transactions is large in the Americas, advanced Asia, the Middle East and Africa, and in the Commonwealth of Independent States. It is relatively low in the other regions.

Figure 13.14 focuses on the distribution of proposed and rejected transactions by firm size. Multinationals and large corporations take care of almost half of the proposed transactions and only a quarter of the rejected transactions. In contrast, micro and small- and medium-size enterprises take care of only 12% of the proposed transactions and almost double that (22%) of rejected transactions. The midcap firms are in between. The probability of a rejected transaction is thus substantially larger for smaller firms.

In subsequent work, the ADB analysed some of the causes and consequences of rejected trade finance transactions. Figure 13.15 starts with

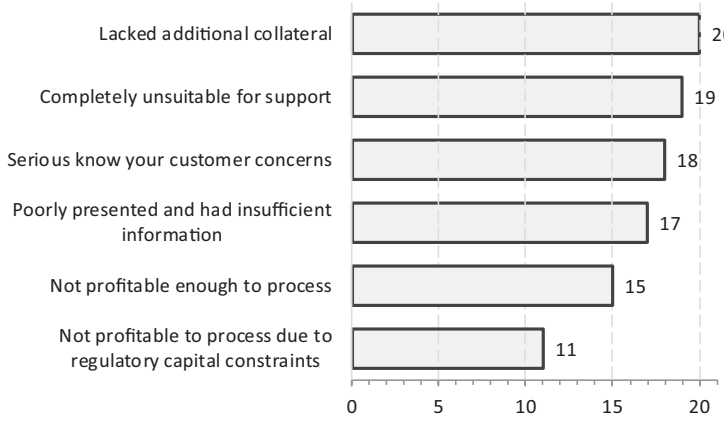
FIGURE 13.14 Proposed and rejected trade finance transactions; by firm size (%), 2017



Source: Created by using ADB (2017) data

Note: multinationals include large corporations; SMEs = small and medium-size enterprises

FIGURE 13.15 Why trade finance proposals were rejected; % of applications, 2019



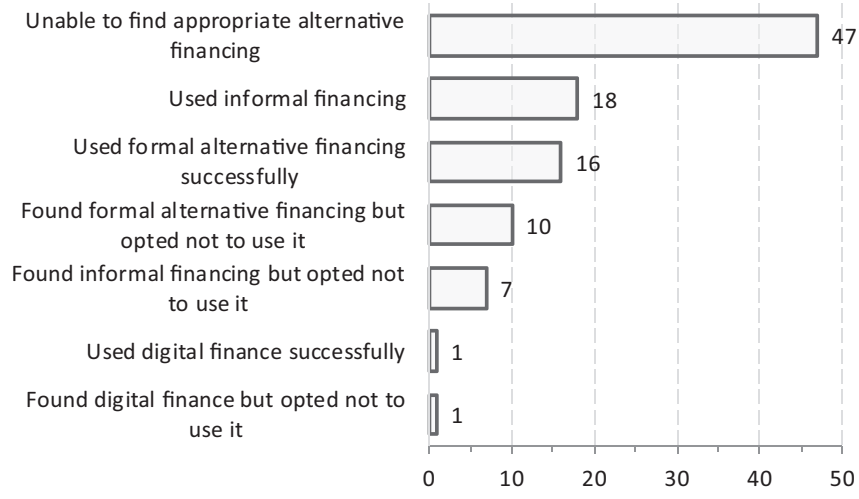
Source: Created by using ADB (2019) data

the causes of rejection and shows that many projects lack additional collateral or are simply unsuitable for support. Other important reasons for rejection are the inability of banks to really know their customers, poor presentation, and insufficient information. Less common reasons are a lack of profitability of the finance transaction and regulatory capital constraints.

In most cases, the consequence of rejected trade finance proposals is that the transaction does not take place. An imperfect indication is provided in Figure 13.16, which lists respondents' outcomes after they sought alternative finance. In almost half of the cases (47%), respondents were not able to find appropriate alternative finance, while in 18% of the cases, they found alternative, informal, or digital finance (in 10%, 7%, and 1% of the cases, respectively) but opted not to use it. Hence, about 65% of the rejected trade finance transactions failed to materialize. The remaining projects were financed eventually, about 18% through informal financing, 16% through alternative formal financing, and 1% through digital financing.

ADB (2019) estimates that the global trade finance gap is large but stable at USD1.5 trillion. The global regional distribution is fairly stable, but the gap is particularly large for smaller firms. This shortage in trade finance needs continues to hamper international trade, particularly for the smallest firms in developing countries. ADB (2019) finds no evidence that improved technology is reducing the gap.

FIGURE 13.16 Outcome of efforts to seek alternative trade financing; SMEs (%), 2019



Source: Created by using ADB (2019) data

Note: % of respondents; SMEs = small and medium-size enterprises

13.8 INTERNATIONAL CURRENCIES

We noted in section 13.6 that the dollar performs the role of an international currency. In this section, we briefly look at the consequences of this characteristic of the world economy. International currencies perform the same roles as national currency but also are used outside the country of origin. Table 13.6 presents a widely accepted typology.

International currencies act as a medium of exchange just as a national currency would, but on a larger scale. These are the so-called *vehicle* currencies that facilitate currency exchanges. If businesses need to exchange, for example, the Bhutan ngultrum into the Rwandan franc, the US dollar is in the middle and two exchanges take place because there is no market that exchanges both currencies directly. So the ngultrum is exchanged into dollars, and dollars into francs. The US dollar is the main currency in this respect. According to the Bank of International Settlements (BIS, 2019), 88% of all trades in April 2019 involved the US dollar. Closely related to this function is that these currencies are a safe store of value in unstable local markets. It protects private actors against extreme inflation, and the trust in the US government can be higher than that in a local government.

In financial markets, there is a home-market effect, which means that investors have a bias in favour of investments in the home-market currency. For international currencies, this is different. US firms – even if they are small – can easily borrow money from foreign investors because foreign investors have little difficulty lending in US dollars. This gives US borrowers an advantage that firms in other countries – for example, developing countries with a less developed financial market – do not have. This is partly an explanation of one of the Obstfeld and Rogoff (2000) puzzles.

The special position of international currencies and in particular of the US dollar is also reflected in the denomination of securities and invoice share of these international currencies. Gopinath (2016) documents that for many countries a large share of imports and exports is denominated by the US dollar. If trade is denominated by a particular currency, traders can reduce the exchange rate risk by also holding funds and securities in the same currency.

TABLE 13.6 Functions of international currencies

Sector	*Functions*		
	Medium of exchange	*Store of value*	*Unit of account*
Private sector	Vehicle currency Liquid and safe asset markets	Nominal securities issuance Banking and cash hoarding	Denomination of securities Trade invoicing
Official sector	Intervention currency Lender of last resort	Reserves	Exchange rate peg

Source: Gourinchas, Rey, and Sauzet (2019)

For central banks – the official sector – the special role of international currencies implies that if they have to intervene in currency markets, it is efficient to do so using a currency that most market players use – that is, an international currency. As a consequence, holding reserves in these currencies is a precaution for when the need arrives to intervene.

A reserve currency gives the country of origin, the hegemon, an advantage. Exchange rate risks are in general not as severe as for other countries; running a current account deficit for extended periods of time is not as problematic as it is for other countries (a deficit is needed to provide the world with enough of the reserve currency); and it has easier access to global capital markets than do other countries. For unstable countries with governments that are unable to handle the economy, such a currency provides a safe haven. But what are the disadvantages?

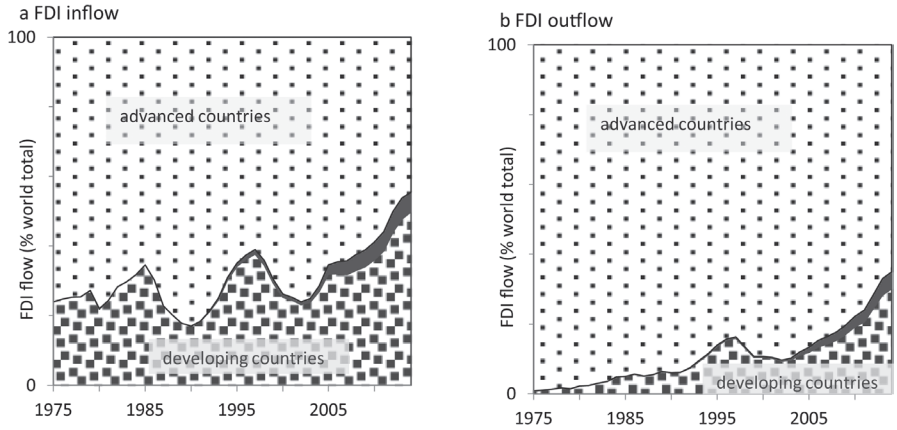
It turns out that an appreciation of the dollar is transmitted in import and export prices throughout the world while insulating the US from these price changes. Gopinath et al. (2019) find that a 1% appreciation of the dollar results in a 0.6%–0.8% decline in (world) trade. The special position of the reserve currency also affects the discussion of the trilemma in section 13.5; see Rey (2016). As discussed in section 13.5, a flexible exchange rate should allow a country to perform independent monetary policy, but a strong reserve on which a country relies interferes with this because monetary conditions are sensitive to monetary policies in the hegemon country, in practice the US. So reserve currencies enable unstable countries to find safe havens but also make them dependent on the policies of another country, in practice the US.

13.9 FINANCE, INVESTMENT, AND DEVELOPMENT

Foreign direct investments (FDIs) are important sources of investment for many countries. If a foreign investor acquires a controlling stake in a firm, it is an FDI.[11] If the investment does not result in a controlling stake in the firm, it is called a portfolio or equity investment. The threshold to qualify as FDI is in practice 10% or higher. FDI can be a greenfield investment – that is, the construction of a new production facility – or a merger & acquisition (M&A) – that is, a takeover of an existing firm. Most FDI is in the form of a M&As; see Antràs and Yeaple (2014).

The distribution of the stock of FDI is shown in more detail in Figure 13.17 for 166 countries, classified in global regions. Panel A shows inward FDI (the countries as destinations of FDI) and panel B shows outward FDI (the countries as sources of FDI). There are five main regions active in FDI (certainly as a source): Europe, North America, East Asia, Southeast Asia, and the Pacific. The role of other regions in global FDI is minimal, particularly as a source. The importance of Hong Kong and Singapore in global FDI, both as source and as destination, is noteworthy. The largest net source FDI countries (measured as the difference in the percentage of global outward FDI and the percentage of global inward FDI) are the US (4.9%), Germany (3.3%), Japan (3.2%), and France (2.0%). The largest net destinations FDI countries (measured similarly) are Brazil (-1.8%), China (-1.5%), Singapore (-1.5%), and Mexico (-1.0%).

FIGURE 13.17 Distribution of FDI; advanced, developing, and transition countries, 1975–2014



Source: Van Marrewijk (2017)

Note: data in 1975 are based on a five-year moving average for 1971–1975, and the others follow this five-year model; the small area in between advanced countries and developing countries is for transition countries; 'developing countries' excludes financial centres in the Caribbean

Why do investors engage in FDI? (see also Chapter 4 of this book). The literature distinguishes between two main forces: a *horizontal* motive and a *vertical* motive. With horizontal FDI, a firm copies the production facility at home in the foreign market in order to serve customers in that market – hence the term 'horizontal'. With vertical FDI, a firm establishes a foreign branch that produces an intermediate step in the production process for the final product – hence the term 'vertical'. With horizontal FDI, a firm is looking for interesting markets, such as a market with sufficiently many wealthy customers to buy a certain type of product. For this type of investment, low costs in the foreign market are less important than those in a developed market. For vertical FDI cost differences tend to be most important. This includes, for example, low local wages for labour-intensive parts of the production process but can also be based on other types of cost advantages. In practice, one finds combinations of both motives.

The horizontal versus vertical typology structures the discussion on FDI. Figure 13.17 shows that most FDI takes place between advanced countries, which suggests that the dominant motive for FDI is that firms are looking not for low-cost destinations to set up an establishment but for interesting markets. This observation does not imply that the vertical FDI motive is absent; many FDI flows are between developing countries and advanced countries. For these flows, the vertical FDI motive is usually important. What is striking in Figure 13.17 is that developing countries increasingly participate in FDI. But why do forms not simply export and import and instead go to the trouble to set up a foreign establishment? Dunning (1981) describes the main aspects of multinational ownership in his famous OLI framework. The *o* stands for ownership advantages and

indicates that a firm has expertise that other firms do not have, like patents, technology and management practices. The *l* stands for location advantages in the foreign market. A foreign market might have advantages such as low wages or large markets that compensate for the additional cost of setting up an additional facility. Finally, the *i* stands for internalization advantages and indicates that because of transaction frictions, it is beneficial to produce something in-house rather than to outsource. All three advantages are necessary to explain the existence of multinational firms.

What are the effects of FDI on the destination markets? These investments can contribute to further development by increasing capital in the host markets. There is, however, also a risk of crowding out; if FDI is financed locally, it could make investments for domestic firms more difficult if lenders prefer FDI over local firms. The effects of FDI on economic growth in the host countries is also ambiguous. Multinational firms – on average – pay higher wages, are more innovative and skill intensive than local firms, but the effects are positive only when FDI is accompanied by a mature financial sector; see Alfaro, Chanda, Kalemli-Ozcan, and Sayek (2004).

FDI can also have positive effects on local firms through knowledge spillovers that increase productivity in local firms. Furthermore, local firms can benefit from multinational activity through forward and backward linkages. Forward linkages refer to the supply of high-quality intermediate products by multinationals. Backward linkages refer to the demand for local inputs by multinationals. Of course, there are also negative effects of multinational production. The additional demand for finance might crowd out local firms; they can monopolize local markets and raise wages such that the most qualified workers are no longer available to local firms. The net effects of FDI are not clear-cut; see Alfaro and Chauvin (2020) for a recent survey.

13.10 CONCLUSIONS

In this chapter, we highlighted the interrelations between countries through trade and finance and illustrated some of the policy consequences. We presented a short history of exchange rate regimes, illustrated international vehicle currencies, and discussed capital and investment flows.

A key link between a country and the rest of the world is through the exchange rate. Prices in one country have to be translated into another's currency. As trade takes time (order now, pay later), expectations about exchange rates become important, which establishes a link between the exchange rate and interest rates; the covered and uncovered interest parity conditions. This link between exchanges is crucial for understanding the possibilities and limitations of monetary policy and finance opportunities for firms that are internationally active. Firms in more-unstable countries have a more difficult time financing their international operations. International financial relations also limit policy choices for a government. This is the so-called policy trilemma. One can choose only two out of the following three policy preferences: monetary policy independence, a fixed exchange rate, full international capital mobility. The case of Argentina shows how difficult this choice is (Box 13.2).

The key lesson of this chapter is that trade, finance and government policies are fundamentally interrelated.

Notes

1 This uses World Bank Development Indicators online GDP income for 2018 as a reference.
2 UTC = universal time coordinated, successor to Greenwich mean time.
3 www.staradvertiser.com/2016/12/29/breaking-news/what-it-means-if-trump-names-china-a-currency-manipulator/.
4 Since 1994, China's current account balance remained a surplus. It reached a peak in relative terms in 2007 (9.9% of GDP) and has almost disappeared since then (0.4% of GDP in 2018).
5 The futures market is slightly different from the forwards market in that only a few currencies are traded, with standardized contracts at certain locations (such as the Chicago Mercantile Exchange, the largest futures market) and specific maturity dates.
6 We can, of course, get indirect measures from surveys, consensus forecasts, and so on.
7 For econometric reasons, the actual test is usually in deviation from St.
8 Based on World Bank Development Indicators online GDP deflator.
9 See Beugelsdijk, Brakman, Garretsen, and van Marrewijk (2013) for a similar analysis.
10 General historical information in this section is based on that on Wikipedia; http://en.wikipedia.org.
11 See also Chapter 4 of this book for a more extensive discussion.

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Questions for chapter 13: international trade, finance, and development

QUESTION 13.1 Suppose you want to buy a car. You want to buy either a Chevrolet for USD23,000, a Volkswagen for €15,900, a Honda for ¥2.2 million, or a Hyundai for ₩22 million. The following exchange rates are given.

	Foreign currency per dollar	*Foreign currency per euro*
US dollar	1.0	1.3
Euro	0.8	1.0
Japanese yen	106.0	135.9
Korean won	1120.9	1437.1

13.1A Which car is cheapest when all prices are expressed in US dollars?
13.1B Do relative prices change when expressed in euros? Explain why this is the case.
13.1C Which currency has to appreciate for the cheapest car to become more expensive?
13.1D Which currencies have to depreciate for the cheapest car to become more expensive?

QUESTION 13.2 Imagine you have €100.000 and want to invest it in the foreign exchange market. After conducting an extensive analysis, you conclude what the exchange rates will be one year ahead. The following table gives both the spot exchange rate of the amount of foreign currency per euro and the expected exchange rate in one year.

	Spot rate	*Expected future rate*
Australian dollar	1.71	1.77
British pound	0.69	0.72
Japanese yen	135.2	130.0
US dollar	1.27	1.24

13.2A Explain in which currency you want to invest.
13.2B How many euros do you expect to have in one year?

QUESTION 13.3 Suppose you own a car assembly line in Mexico. The different parts of the car are imported from the United States and the assembled cars are exported back to the United States.

13.3A What happens to the price of the imports when the Mexican peso depreciates?
13.3B Does your car become more or less attractive to US consumers when the Mexican peso depreciates? Explain.

13.3C As a Mexican producer, do you think the depreciation of the Mexican peso is a good thing?

QUESTION 13.4 On Monday, 1 November 2004, the dollar/euro exchange rate was 1.2748 and the dollar/euro 12 months forward exchange rate was 1.2717.

13.4A Calculate the annual forward premium of the euro and the dollar.
13.4B Explain whether the forward premium indicates that investors expect the euro to appreciate or depreciate in the future.
13.4C If you expect that the euro will appreciate, should you buy or sell a forward euro contract?

QUESTION 13.5 An investor in London has two investment opportunities. They can invest in two-year UK government bonds with an annual nominal interest rate of 4.5%, or they can invest in two-year US government bonds with an annual nominal interest rate of 2.6%. Currently the spot exchange rate is 1.8 US dollar/UK pound, and the two-year forward exchange rate is 1.7 US dollar/UK pound.

13.5A Should the investor hold their money in UK or US government bonds?
13.5B Does the covered interest parity hold? Do you think this situation will exist for a long time?

QUESTION 13.6 The covered and uncovered interest parity condition constitutes a powerful tool to predict exchange rate movements. The following is a list of a number of events. Predict with the covered or uncovered interest parity condition what will happen with the euro/US dollar spot exchange rate.

13.6A The US Federal Reserve announces that the discount rate will be lowered.
13.6B GDP figures of the euro area turn out to be better than expected, raising expectations that the European economy is coming sooner out of its slump.
13.6C The ECB president hesitates before he says 'strong euro'.
13.6D Most large US companies unexpectedly raise their profit prospects.

QUESTION 13.7 13.7A A nation might try to achieve three main policy objectives: monetary policy independence, a fixed exchange rate, and international capital mobility. What are the merits of each of these objectives? Why are they desirable?

13.7B Since the year 2000, US policymakers have grown concerned about the exchange rate between the US dollar and the Chinese yuan. Effectively, the yuan was fixed to the dollar at a rate they considered to be inappropriate. Moreover, China was able to maintain some monetary independence. What does this imply for capital mobility?

13.7C The buoyant growth of the Chinese economy in the 21st century has attracted a lot of capital to China. Given that capital restrictions are hard to enforce perfectly, Chinese money growth has been rapid. What does this imply for monetary policy independence?

13.7D As the Chinese economy integrates ever more tightly into the global economic system, capital restrictions will become ever harder to enforce. What policy options do the Chinese monetary authorities have in light of this development?