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**Abstract:** If the government of a country wants to reduce trade deficits, what should it do? Should it try to limit imports, perhaps by imposing a quota on the import of cars from Japan or Germany? Or should it try to influence the country's trade deficit in some other way? The goal of the model in this article is to highlight the forces that determine the economy's trade balance and exchange rate. In one sense, the model is simple: it applies the tools of supply and demand to an open economy. Yet the model is also more complicated than others we have seen because it involves looking simultaneously at two related markets – the market for loanable funds and the market for foreign currency exchange. After we develop this model of the open economy, we use it to examine how various events and policies affect the economy's trade balance and exchange rate. We shall then be able to determine the government policies that are most likely to reverse trade deficits.

**Introduction.** To understand what factors determine a country's trade balance and how government policies can affect it, we need a macroeconomic theory of the open economy. The preceding chapter introduced some of the key macroeconomic variables that describe an economy's relationship with other economies – including net exports, net capital outflow, and the real and nominal exchange rates. This chapter develops a model that identifies the forces that determine these variables and shows how these variables are related to one another. To develop this macroeconomic model of an open economy, we build on our previous analysis in two important ways. First, the model takes the economy's GDP as given. We assume that the economy's output of goods and services, as measured by real GDP, is determined by the supplies of the factors of production and by the available production technology that turns these inputs into output. Second, the model takes the economy's price level as given. We assume that the price level adjusts to bring the supply and demand for money into balance.

**Methods.** The article discusses a macroeconomic theory of the open economy. Its main structural factors and parts are described. A macroeconomic theory of the open economy was analyzed. Approaches to a macroeconomic theory of the open economy were studied.

**Results and discussion.** To understand the forces at work in an open economy, we focus on supply and demand in two markets. The first is the market for loanable funds, which coordinates the economy's saving, investment and the flow of loanable funds abroad (called the net capital outflow). The second is the market for foreign currency exchange, which coordinates people who want to exchange the domestic currency for the currency of other countries. In this section we discuss supply and demand in each of these markets. In the next section we put these markets together to explain the overall equilibrium for an open economy. When we first analysed the role of the financial system in Chapter 23, we made the simplifying assumption that the financial system consists of only one market, called the market for loanable funds. All savers go to this market to deposit their saving and all borrowers go to this market to get their loans. In this market, there is one interest rate, which is both the return to saving and the cost of borrowing.

Whenever a nation saves some of its income, it can use that money to finance the purchase of domestic capital or to finance the purchase of an asset abroad. The two sides of this identity represent the two sides of the market for loanable funds. The supply of loanable funds comes from national saving (S). The demand for loanable funds comes from domestic investment (I) and net capital outflow (NCO). Note that the purchase of a capital asset adds to the demand for loanable funds, regardless of whether that asset is located at home or abroad. Because net capital outflow can be either positive or negative, it can either add to or subtract from the demand for loanable funds that

arises from domestic investment. The quantity of loanable funds supplied and the quantity of loanable funds demanded depend on the real interest rate. A higher real interest rate encourages people to save and, therefore, raises the quantity of loanable funds supplied. A higher interest rate also makes borrowing to finance capital projects more costly; thus, it discourages investment and reduces the quantity of loanable funds demanded. In addition to influencing national saving and domestic investment, the real interest rate in a country affects that country's net capital outflow. To see why, consider two investment funds – one in the United Kingdom and one in Germany – deciding whether to buy a UK government bond or a German government bond. The investment funds would make this decision in part by comparing the real interest rates in the United Kingdom and Germany. When the UK real interest rate rises, the UK bond becomes more attractive to both investment funds. Thus, an increase in the UK real interest rate discourages Brits from buying foreign assets and encourages people living in other countries to buy UK assets. For both reasons, a high UK real interest rate reduces UK net capital outflow. Unlike the situation in our previous discussion, however, the demand side of the market now represents the behaviour of both domestic investment and net capital outflow. That is, in an open economy, the demand for loanable funds comes not only from those who want loanable funds to buy domestic capital goods but also from those who want loanable funds to buy foreign assets. The interest rate adjusts to bring the supply and demand for loanable funds into balance. If the interest rate were below the equilibrium level, the quantity of loanable funds supplied would be less than the quantity demanded. The resulting shortage of loanable funds would push the interest rate upward. Conversely, if the interest rate were above the equilibrium level, the quantity of loanable funds supplied would exceed the quantity demanded. The surplus of loanable funds would drive the interest rate downward. At the equilibrium interest rate, the supply of loanable funds exactly balances the demand. That is, at the equilibrium interest rate, the amount that people want to save exactly balances the desired quantities of domestic investment and net capital outflow.

The second market in our model of the open economy is the market for foreign currency exchange. Let's think of the UK as the domestic economy. Participants in this market trade UK pounds in exchange for foreign currencies. Our model of the open economy treats the two sides of this identity as representing the two sides of the market for foreign currency exchange. Net capital outflow represents the quantity of pounds supplied for the purpose of buying foreign assets. For example, when a UK investment fund wants to buy a Japanese government bond, it needs to change pounds into yen, so it supplies pounds in the market for foreign currency exchange. Net exports represent the quantity of pounds demanded for the purpose of buying UK net exports of goods and services. For example, when a Japanese airline wants to buy aircraft fuel produced by BP, it needs to change its yen into pounds, so it demands pounds in the market for foreign currency exchange. What price balances the supply and demand in the market for foreign currency exchange? The answer is the real exchange rate. As we saw in the preceding chapter, the real exchange rate is the relative price of domestic and foreign goods and, therefore, is a key determinant of net exports. When the UK real exchange rate appreciates, UK goods become more expensive relative to foreign goods, making UK goods less attractive to consumers abroad (exports would rise) and foreign goods more attractive to domestic consumers (imports would rise). For both reasons, net UK exports fall. Hence, an appreciation of the real exchange rate reduces the quantity of pounds demanded in the market for foreign currency exchange.

The real exchange rate adjusts to balance the supply and demand for pounds just as the price of any good adjusts to balance supply and demand for that good. If the real exchange rate were below the equilibrium level, the quantity of pounds supplied would be less than the quantity demanded. The resulting shortage of pounds would push the value of the pound upwards. Conversely, if the real exchange rate were above the equilibrium level, the quantity of pounds supplied would exceed the quantity demanded. The surplus of pounds would drive the value of the pound downward. At the

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equilibrium real exchange rate, the demand for pounds by non-UK residents arising from the UK net exports of goods and services exactly balances the supply of pounds from UK residents arising from UK net capital outflow. At this point, it is worth noting that the division of transactions between ‘supply’ and ‘demand’ in this model is somewhat artificial. In our model, net exports are the source of the demand for pounds, and net capital outflow is the source of the supply. Thus, when a UK resident imports a car made in Japan, our model treats that transaction as a decrease in the quantity of pounds demanded (because net exports fall) rather than an increase in the quantity of pounds supplied. Similarly, when a Japanese citizen buys a UK government bond, our model treats that transaction as a decrease in the quantity of pounds supplied (because net capital outflow falls) rather than an increase in the quantity of pounds demanded. This use of language may seem somewhat unnatural at first, but it will prove useful when analysing the effects of various policies.

In the market for loanable funds, supply comes from national saving, demand comes from domestic investment and net capital outflow, and the real interest rate balances supply and demand. In the market for foreign currency exchange, supply comes from net capital outflow, demand comes from net exports, and the real exchange rate balances supply and demand. Net capital outflow is the variable that links these two markets. In the market for loanable funds, net capital outflow is part of demand. A person who wants to buy an asset abroad must finance this purchase by obtaining resources in the market for loanable funds. In the market for foreign currency exchange, net capital outflow is the source of supply. A person who wants to buy an asset in another country must supply pounds in order to exchange them for the currency of that country. A trade policy is a government policy that directly influences the quantity of goods and services that a country imports or exports. Trade policy takes various forms. One common trade policy is a tariff, a tax on imported goods. Another is an import quota, a limit on the quantity of a good that can be produced abroad and sold domestically. Trade policies are common throughout the world, although sometimes they are disguised. For example, before 2000 there was an understanding between Japan and the European Union that Japan would voluntarily limit its sales of cars into the UK, France, Italy, Portugal and Spain to a maximum of 1.1 million (excluding cars produced at factories owned by Japanese companies but located within the European Union). These so-called ‘voluntary export restrictions’ are not really voluntary and, in essence, are a form of import quota.

**Conclusion.** To analyse the macroeconomics of open economies, two markets are central – the market for loanable funds and the market for foreign currency exchange. In the market for loanable funds, the interest rate adjusts to balance the supply of loanable funds (from national saving) and the demand for loanable funds (from domestic investment and net capital outflow). In the market for foreign currency exchange, the real exchange rate adjusts to balance the supply of domestic currency (for net capital outflow) and the demand for domestic currency (for net exports). Because net capital outflow is part of the demand for loanable funds and provides the supply of domestic currency for foreign currency exchange, it is the variable that connects these two markets. Historically, international trade has always played a very important role in most European economies. In the past two centuries or so, international finance has also become increasingly important. The typical modern European country consumes a high proportion of goods produced abroad and exports a significant amount of its output to other European countries and to countries outside Europe. In addition, through investment funds and other financial institutions, Europeans borrow and lend in world financial markets, as indeed do the citizens of all advanced industrialized economies. It is clear, therefore, that a proper understanding of macroeconomics requires a study of the workings of the open economy. This chapter has provided a basic model for thinking about the macroeconomics of open economies.

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