Open Economy Macroeconomics

So far, we have simplified the analysis of income determination by assuming a closed economy. In reality, most modern economies are open. Interaction with other economies of the world widens choice in three broad ways

(i) Consumers and firms have the opportunity to choose between domestic and foreign goods. This is the product market linkage which occurs through international trade.

(ii) Investors have the opportunity to choose between domestic and foreign assets. This constitutes the financial market linkage.

(iii) Firms can choose where to locate production and workers to choose where to work. This is the factor market linkage. Labour market linkages have been relatively less due to various restrictions on the movement of people through immigration laws. Movement of goods has traditionally been seen as a substitute for the movement of labour. We focus here on the first two linkages.

An **open economy** is one that trades with other nations in goods and services and, most often, also in financial assets. Indians, for instance, enjoy using products produced around the world and some of our production is exported to foreign countries. Foreign trade, therefore, influences Indian aggregate demand in two ways. First, when Indians buy foreign goods, this spending escapes as a **leakage** from the circular flow of income decreasing aggregate demand. Second, our exports to foreigners enter as an **injection** into the circular flow, increasing aggregate demand for domestically produced goods. Total foreign trade (exports + imports) as a proportion of GDP is a common measure of the **degree of openness** of an economy. In 2004-2005, this was 38.9 per cent for the Indian economy (imports constituted 17.1 per cent and exports 11.8 per cent of GDP). This is substantially higher than a total of 16 per cent that prevailed in 1985-86. However, in comparison to other countries, India is relatively less open. There are several countries whose foreign trade proportions are above 50 per cent of GDP.

Now, when goods move across national borders, **money** must move in the opposite direction. At the international level, there is no single currency that is issued by a central authority. Foreign economic agents will accept a national currency only if they are convinced that the currency will maintain a stable purchasing power. Without this confidence, a currency will not be used as an

international medium of exchange and unit of account since there is no international authority with the power to force the use of a particular currency in international transactions. Governments have tried to gain confidence of potential users by announcing that the national currency will be freely convertible at a fixed price into another asset, over whose value the issuing authority has no control. This other asset most often has been gold, or other national currencies. There are two aspects of this commitment that has affected its credibility – the ability to convert freely in unlimited amounts and the price at which conversion takes place. The **international monetary system** has been set up to handle these issues and ensure stability in international transactions. A nation's commitment regarding the above two issues will affect its trade and financial interactions with the rest of the world.

We begin section 6.1 with the accounting of international trade and financial flows. The next section examines the determination of price at which national currencies are exchanged for each other. In section 6.3, the closed economy income-expenditure model is amended to include international effects.

6.1 The Balance of Payments

The balance of payments (BoP) record the transactions in goods, services and assets between residents of a country with the rest of the world. There are two main accounts in the BoP – the current account and the capital account.

The **current account** records exports and imports in goods and services and transfer payments. Trade in services denoted as invisible trade (because they are not seen to cross national borders) includes both factor income (payment for inputs-investment income, that is, the interest, profits and dividends on our assets abroad minus the income foreigners earn on assets they own in India) and non-factor income (shipping, banking, insurance, tourism, software services, etc.). Transfer payments are receipts which the residents of a country receive 'for free', without having to make any present or future payments in return. They consist of remittances, gifts and grants. They could be official or private. The balance of exports and imports of goods is referred to as the **trade balance**. Adding trade in services and net transfers to the trade balance, we get the **current account balance**. The capital account records all international purchases and sales of assets such as money, stocks, bonds, etc. We note that any transaction resulting in a payment to foreigners is entered as a **debit** and is given a negative sign. Any transaction resulting in a receipt from foreigners is entered as a **credit** and is given a positive sign.

6.1.1 BoP Surplus and Deficit

The essence of international payments is that just like an individual who spends more than her income must finance the difference by selling assets or by borrowing, a country that has a deficit in its current account (spending more abroad than it receives from sales to the rest of the world) must finance it by selling assets or by borrowing abroad. Thus, any current account deficit is of necessity **financed** by a net capital inflow. Table 6.1 (given at the end of chapter) shows that there has been a trade deficit throughout the period and a surplus in invisibles except for 1990-91. The current account deficit (which has been observed for 24 years from 1977-78) had started shrinking and turned into surplus from 2001-02. The surplus continued till 2003-04, but turned into a deficit in 2004-05. The large trade deficit could not be bridged by the invisibles surplus. In April-September 2005-06, the current account deficit of
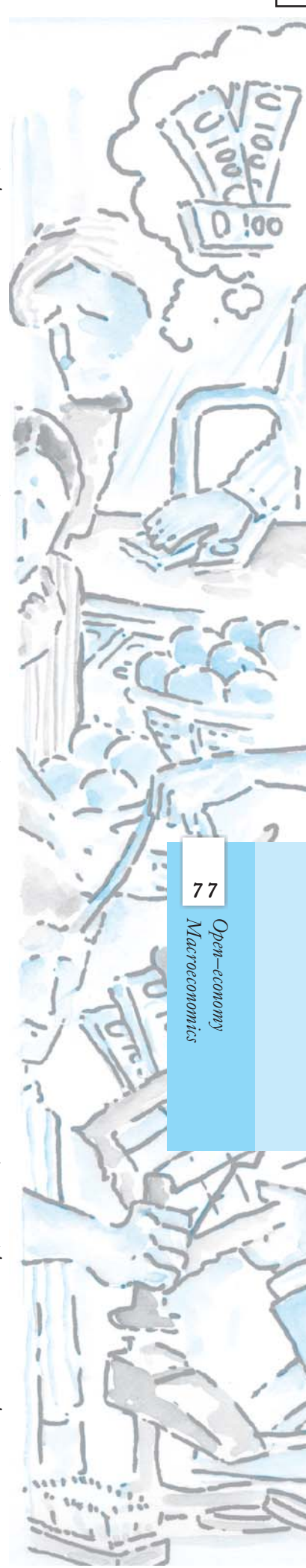
US$13 billion was financed by a capital inflow of US$19.5 billion, the extra capital inflow of US$ 6.5 billion being added to our stock of foreign exchange.

Alternatively, the country could engage in **official reserve transactions**, running down its reserves of foreign exchange, in the case of a deficit by selling foreign currency in the foreign exchange market. The decrease (increase) in official reserves is called the overall balance of payments deficit (surplus). The basic premise is that the monetary authorities are the ultimate financiers of any deficit in the balance of payments (or the recipients of any surplus). A country is said to be in balance of payments equilibrium when the sum of its current account and its non-reserve capital account equals zero, so that the current account balance is financed entirely by international lending without reserve movements. We note that the official reserve transactions are more relevant under a regime of pegged exchange rates than when exchange rates are floating.

Autonomous and Accommodating Transactions: International economic transactions are called **autonomous** when transactions are made independently of the state of the BoP (for instance due to profit motive). These items are called 'above the line' items in the BoP. The balance of payments is said to be in surplus (deficit) if autonomous receipts are greater (less) than autonomous payments. **Accommodating transactions** (termed 'below the line' items), on the other hand, are determined by the net consequences of the autonomous items, that is, whether the BoP is in surplus or deficit. The official reserve transactions are seen as the accommodating item in the BoP (all others being autonomous).

Errors and Omissions constitute the third element in the BoP (apart from the current and capital accounts) which is the 'balancing item' reflecting our inability to record all international transactions accurately.

6.2 THE FOREIGN EXCHANGE MARKET

Having considered accounting of international transactions on the whole, we will now take up a single transaction. Let us assume that an Indian resident wants to visit London on a vacation (an import of tourist services). She will have to pay in pounds for her stay there. She will need to know *where* to obtain the pounds and at what price. Her demand for pounds would constitute a demand for *foreign exchange* which would be

Your currency in exchange for the dollar? Should exchange rates between two currencies continue like this? Discuss.

supplied in the *foreign exchange market* – the market in which national currencies are traded for one another. The major participants in this market are commercial banks, foreign exchange brokers and other authorised dealers and the monetary authorities. It is important to note that, although the participants themselves may have their own trading centres, the market itself is world-wide. There is close and continuous contact between the trading centres and the participants deal in more than one market.

The price of one currency in terms of the other is known as the **exchange rate**. Since there is a symmetry between the two currencies, the exchange rate may be defined in one of the two ways. First, as the amount of domestic currency required to buy one unit of foreign currency, i.e. a rupee-dollar exchange rate of

Rs 50 means that it costs Rs 50 to buy one dollar, and second, as the cost in foreign currency of purchasing one unit of domestic currency. In the above case, we would say that it costs 2 cents to buy a rupee. The practice in economic literature, however, is to use the former definition – as the price of foreign currency in terms of domestic currency. This is the bilateral **nominal exchange rate** – bilateral in the sense that they are exchange rates for one currency against another and they are nominal because they quote the exchange rate in money terms, i.e. so many rupees per dollar or per pound.

However, returning to our example, if one wants to plan a trip to London, she needs to know how expensive British goods are relative to goods at home. The measure that captures this is the **real exchange rate** – the ratio of foreign to domestic prices, measured in the same currency. It is defined as

$$\text{Real exchange rate} = \frac{eP_f}{P} \qquad (6.1)$$

where P and P_f are the price levels here and abroad, respectively, and e is the rupee price of foreign exchange (the nominal exchange rate). The numerator expresses prices abroad measured in rupees, the denominator gives the domestic price level measured in rupees, so the real exchange rate measures prices abroad relative to those at home. If the real exchange rate is equal to one, currencies are at **purchasing power parity**. This means that goods cost the same in two countries when measured in the same currency. For instance, if a pen costs $4 in the US and the nominal exchange rate is Rs 50 per US dollar, then with a real exchange rate of 1, it should cost Rs 200 ($eP_f = 50 \times 4$) in India. If the real exchange rises above one, this means that goods abroad have become more expensive than goods at home. The real exchange rate is often taken as a measure of a country's **international competitiveness**.

Since a country interacts with many countries, we may want to see the movement of the domestic currency relative to all other currencies in a single number rather than by looking at bilateral rates. That is, we would want an index for the exchange rate against other currencies, just as we use a price index to show how the prices of goods in general have changed. This is calculated as the **Nominal Effective Exchange Rate** (NEER) which is a multilateral rate representing the price of a representative basket of foreign currencies, each weighted by its importance to the domestic country in international trade (the average of export and import shares is taken as an indicator of this). The **Real Effective Exchange Rate** (REER) is calculated as the weighted average of the real exchange rates of all its trade partners, the weights being the shares of the respective countries in its foreign trade. It is interpreted as the quantity of domestic goods required to purchase one unit of a given basket of foreign goods.

6.2.1 Determination of the Exchange Rate

The question arises as to why the foreign exchange rate[1] is at this level and what causes its movements? To understand the economic principles that lie behind exchange rate determination, we study the major exchange rate regimes[2] that have characterised the international monetary system. There has been a move from a regime of commitment of fixed-price convertibility to one without commitments where residents enjoy greater freedom to convert domestic currency into foreign currencies but do not enjoy a price guarantee.

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[1]Between any two currencies
[2]An exchange rate regime or system is a set of international rules governing the setting of exchange rates.
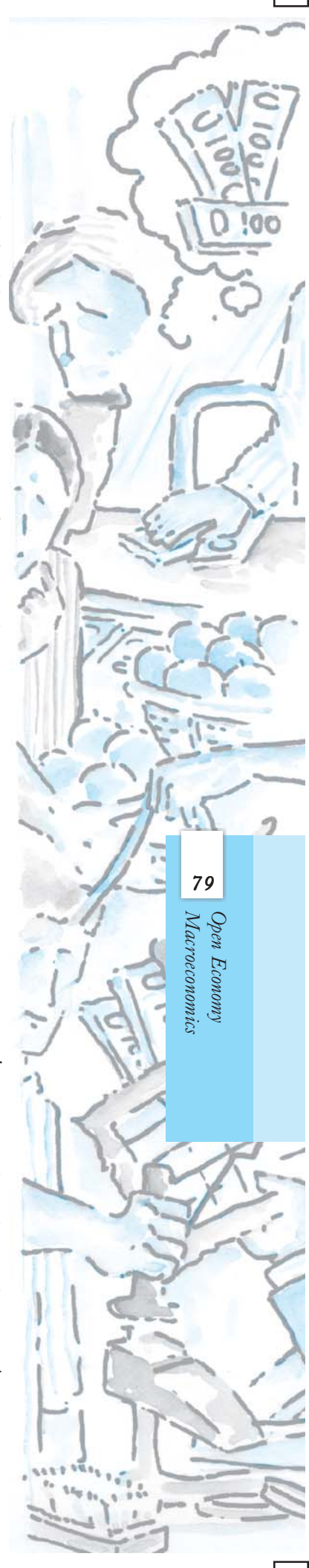
6.2.2 Flexible Exchange Rates

In a system of **flexible exchange rates** (also known as **floating exchange rates**), the exchange rate is determined by the forces of market demand and supply. In a completely flexible system, the central banks follow a simple set of rules – they do nothing to directly affect the level of the exchange rate, in other words they do not intervene in the foreign exchange market (and therefore, there are no official reserve transactions). The link between the balance of payments accounts and the transactions in the foreign exchange market is evident when we recognise that all expenditures by domestic residents on foreign goods, services and assets and all foreign transfer payments (debits in the BoP accounts) also represent demand for foreign exchange. The Indian resident buying a Japanese car pays for it in rupees but the Japanese exporter will expect to be paid in yen. So rupees must be exchanged for yen in the foreign exchange market. Conversely, all exports by domestic residents reflect equal earnings of foreign exchange. For instance, Indian exporters will expect to be paid in rupees and, to buy our goods, foreigners must sell their currency and buy rupees. Total credits in the BoP accounts are then equal to the supply of foreign exchange. Another reason for the demand for foreign exchange is for speculative purposes.

Let us assume, for simplicity, that India and the United States are the only countries in the world, so that there is only one exchange rate to be determined. The demand curve (DD) is downward sloping because a rise in the price of foreign exchange will increase the cost in terms of rupees of purchasing foreign goods. Imports will therefore decline and less foreign exchange will be demanded. For the supply of foreign exchange to increase as the exchange rate rises, the foreign demand for our exports must be more than **unit elastic**, meaning simply that a one per cent increase in the exchange rate (which results in a one per cent decline in the price of the export good to the foreign country buying our good) must result in an increase in demand of more than one per cent. If this condition is met, the rupee volume of our exports will rise more than proportionately to the rise in the exchange rate, and earnings in dollars (the supply of foreign exchange) will increase as the exchange rate rises. However, a vertical supply curve (with a unit elastic foreign demand for Indian exports) would not change the analysis. We note that here we are holding all prices other than the exchange rate constant.

In this case of flexible exchange rates without central bank intervention, the exchange rate moves to clear the market, to equate the demand for and supply of foreign exchange. In Fig.6.1, the equilibrium exchange rate is e^*.

If the demand for foreign exchange goes up due to Indians travelling abroad more often, or increasingly showing a preference for imported goods, the DD curve will shift upward and rightward. The resulting intersection would be at a higher exchange rate. Changes in the price of foreign exchange under flexible exchange
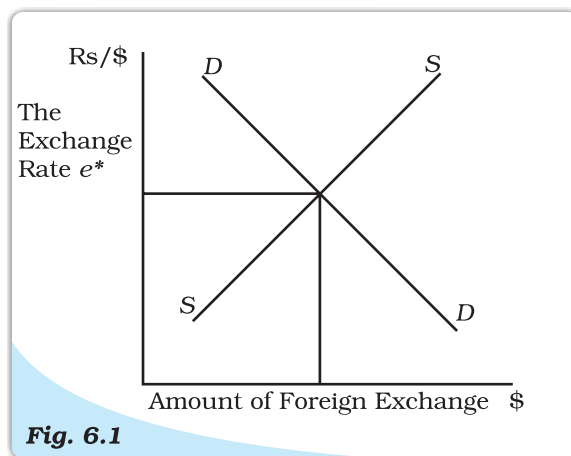

Fig. 6.1

Equilibrium under Flexible Exchange Rates

rates are referred to as currency depreciation or appreciation. In the above case, the domestic currency (rupee) has **depreciated** since it has become less expensive in terms of foreign currency. For instance, if the equilibrium rupee-dollar exchange rate was Rs 45 and now it has become Rs 50 per dollar, the rupee has depreciated against the dollar. By contrast, the currency **appreciates** when it becomes more expensive in terms of foreign currency.

Fig. 6.2

Effect of an Increase in Demand for Imports in the Foreign Exchange Market

At the initial equilibrium exchange rate e^*, there is now an excess demand for foreign exchange. To clear the market, the exchange rate must rise to the equilibrium value e_1 as shown in Fig. 6.2. The rise in exchange rate (depreciation) will cause the quantity of import demand to fall since the rupee price of imported goods rises with the exchange rate. Also, the quantity of exports demanded will increase since the rise in the exchange rate makes exports less expensive to foreigners. At the new equilibrium with e_1, the supply and demand for foreign exchange is again equal.

Speculation: Exchange rates in the market depend not only on the demand and supply of exports and imports, and investment in assets, but also on foreign exchange speculation where foreign exchange is demanded for the possible gains from appreciation of the currency. Money in any country is an asset. If Indians believe that the British pound is going to increase in value relative to the rupee, they will want to hold pounds. For instance, if the current exchange rate is Rs 80 to a pound and investors believe that the pound is going to appreciate by the end of the month and will be worth Rs 85, investors think if they took Rs 80,000 and bought 1,000 pounds, at the end of the month, they would be able to exchange the pounds for Rs 85,000, thus making a profit of Rs 5,000. This expectation would increase the demand for pounds and cause the rupee-pound exchange rate to increase in the present, making the beliefs self-fulfilling.

The above analysis assumes that interest rates, incomes and prices remain constant. However, these may change and that will shift the demand and supply curves for foreign exchange.

Interest Rates and the Exchange Rate: In the short run, another factor that is important in determining exchange rate movements is the **interest rate differential** i.e. the difference between interest rates between countries. There are huge funds owned by banks, multinational corporations and wealthy individuals which move around the world in search of the highest interest rates. If we assume that government bonds in country A pay 8 per cent rate of interest whereas equally safe bonds in country B yield 10 per cent, the interest rate diferential is 2 per cent. Investors from country A will be attracted by the high interest rates in country B and will buy the currency of country B selling their own currency. At the same time investors in country B will also find investing in their own country more attractive and will therefore demand less
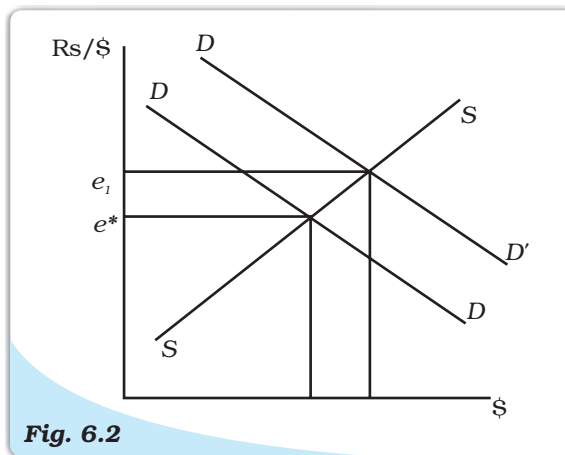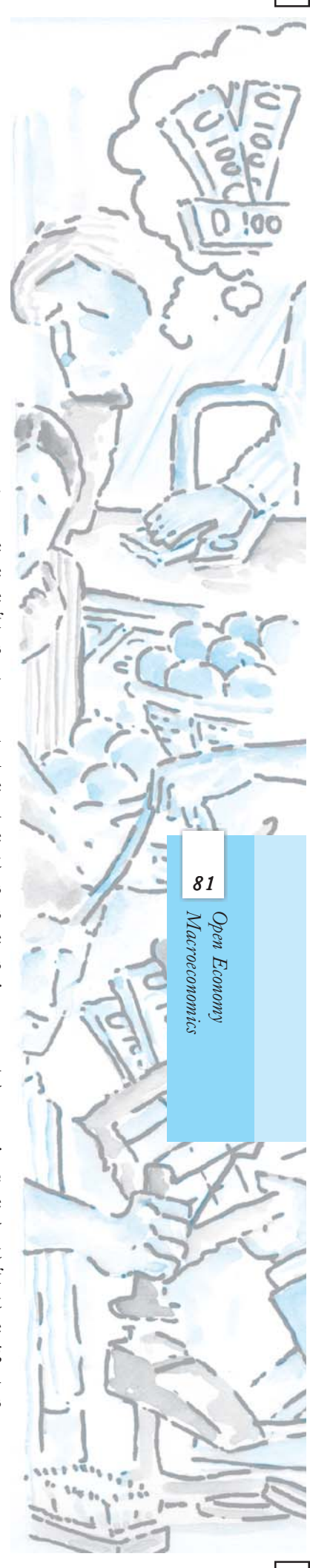
of country A's currency. This means that the demand curve for country A's currency will shift to the left and the supply curve will shift to the right causing a depreciation of country A's currency and an appreciation of country B's currency. Thus, *a rise in the interest rates at home often leads to an appreciation of the domestic currency.* Here, the implicit assumption is that no restrictions exist in buying bonds issued by foreign governments.

Income and the Exchange Rate: When income increases, consumer spending increases. Spending on imported goods is also likely to increase. When imports increase, the demand curve for foreign exchange shifts to the right. There is a depreciation of the domestic currency. If there is an increase in income abroad as well, domestic exports will rise and the supply curve of foreign exchange shifts outward. On balance, the domestic currency may or may not depreciate. What happens will depend on whether exports are growing faster than imports. In general, other things remaining equal, a country whose aggregate demand grows faster than the rest of the world's normally finds its currency depreciating because its imports grow faster than its exports. Its demand curve for foreign currency shifts faster than its supply curve.

Exchange Rates in the Long Run: The Purchasing Power Parity (PPP) theory is used to make long-run predictions about exchange rates in a flexible exchange rate system. According to the theory, as long as there are no barriers to trade like tariffs (taxes on trade) and quotas (quantitative limits on imports), exchange rates should eventually adjust so that the same product costs the same whether measured in rupees in India, or dollars in the US, yen in Japan and so on, except for differences in transportation. Over the long run, therefore, exchange rates between any two national currencies adjust to reflect differences in the price levels in the two countries.

EXAMPLE ———————— 6.1

If a shirt costs $8 in the US and Rs 400 in India, the rupee-dollar exchange rate should be Rs 50. To see why, at any rate higher than Rs 50, say Rs 60, it costs Rs 480 per shirt in the US but only Rs 400 in India. In that case, all foreign customers would buy shirts from India. Similarly, any exchange rate below Rs 50 per dollar will send all the shirt business to the US. Next, we suppose that prices in India rise by 20 per cent while prices in the US rise by 50 per cent. Indian shirts would now cost Rs 480 per shirt while American shirts cost $12 per shirt. For these two prices to be equivalent, $12 must be worth Rs 480, or one dollar must be worth Rs 40. The dollar, therefore, has depreciated.

According to the PPP theory, differences in the domestic inflation and foreign inflation are a major cause of adjustment in exchange rates. *If one country has higher inflation than another, its exchange rate should be depreciating.*

However, we note that if American prices rise faster than Indian prices and, at the same time, countries erect tariff barriers to keep Indian shirts out (but not American ones), the dollar may not depreciate. Also, there are many goods that are not tradeable and inflation rates for them will not matter. Further, few goods that different countries produce and trade are uniform or identical. Most economists contend that other factors are more important than relative prices for exchange rate determination in the short run. However, in the long run, purchasing power parity plays an important role.

6.2.3 Fixed Exchange Rates

Countries have had flexible exchange rate system ever since the breakdown of the Bretton Woods system in the early 1970s. Prior to that, most countries had fixed or what is called **pegged exchange rate system**, in which the exchange rate is pegged at a particular level. Sometimes, a distinction is made between the fixed and pegged exchange rates. It is argued that while the former is fixed, the latter is maintained by the monetary authorities, in that the value at which the exchange rate is pegged (the par value) is a policy variable – it may be changed. There is a common element between the two systems. Under a fixed exchange rate system, such as the gold standard, adjustment to BoP surpluses or deficits cannot be brought about through changes in the exchange rate. Adjustment must either come about 'automatically' through the workings of the economic system (through the mechanism explained by Hume, given below) or be brought about by the government. A pegged exchange rate system may, as long as the exchange rate is not changed, and is not expected to change, display the same characteristics. However, there is another option open to the government – it may change the exchange rate. A **devaluation** is said to occur when the exchange rate is increased by social action under a pegged exchange rate system. The opposite of devaluation is a **revaluation**. Or, the government may choose to leave the exchange rate unchanged and deal with the BoP problem by the use of monetary and fiscal policy. Most governments change the exchange rate very infrequently. In our analysis, we use the terms fixed and pegged exchange rates interchangeably to denote an exchange rate regime where the exchange rate is set by government decisions and maintained by government actions.

We examine the way in which a country can 'peg' or fix the level of its exchange rate. We assume that Reserve bank of India (RBI) wishes to fix an exact par value for the rupee at Rs 45 per dollar (e_1 in Fig. 6.3). Assuming that this official exchange rate is below the equilibrium exchange rate (here e^* = Rs 50) of the flexible exchange rate system, the rupee will be **overvalued** and the dollar **undervalued**. This means that if the exchange rate were market determined, the price of dollars in terms of rupees would have to rise
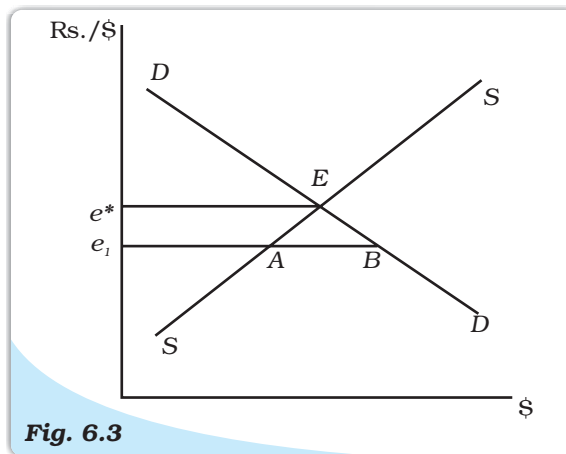

Fig. 6.3

Foreign Exchange Market with Pegged Exchange Rate

to clear the market. At Rs 45 to a dollar, the rupee is more expensive than it would be at Rs 50 to a dollar (thinking of the rate in dollar-rupee terms, now each rupee costs 2.22 cents instead of 2 cents). At this rate, the demand for dollars is higher than the supply of dollars. Since the demand and supply schedules were constructed from the BoP accounts (measuring only autonomous transactions), this excess demand implies a deficit in the BoP. The deficit is bridged by central bank intervention. In this case, the RBI would sell dollars for rupees in the foreign exchange market to meet this excess demand AB, thus neutralising the upward pressure on the exchange rate. The RBI stands ready to buy and sell dollars at that rate to prevent the exchange

rate from rising (since no one would buy at more) or falling (since no one would sell for less).

Now the RBI might decide to fix the exchange rate at a higher level – Rs 47 per dollar – to bridge part of the deficit in BoP. This devaluation of the domestic currency would make imports expensive and our exports cheaper, leading to a narrowing of the trade deficit. It is important to note that repeated central bank intervention to finance deficits and keep the exchange rate fixed will eventually exhaust the official reserves. This is the main flaw in the system of fixed exchange rates. Once speculators believe that the exchange rate cannot be held for long they would buy foreign exchange (say, dollars) in massive amounts. The demand for dollars will rise sharply causing a BoP deficit. Without sufficient reserves, the central bank will have to allow the exchange rate to reach its equilibrium level. This might amount to an even larger devaluation than would have been required before the speculative 'attack' on the domestic currency began.

International experience shows that it is precisely this that has led many countries to abandon the system of fixed exchange rates. Fear of such an attack induced the US to let its currency float in 1971, one of the major events which precipitated the breakdown of the Bretton Woods system.

6.2.4 Managed Floating

Without any formal international agreement, the world has moved on to what can be best described as a **managed floating** exchange rate system. It is a mixture of a flexible exchange rate system (the float part) and a fixed rate system (the managed part). Under this system, also called **dirty floating**, central banks intervene to buy and sell foreign currencies in an attempt to moderate exchange rate movements whenever they feel that such actions are appropriate. Official reserve transactions are, therefore, not equal to zero.

6.2.5 Exchange Rate Management: The International Experience

The Gold Standard: From around 1870 to the outbreak of the First World War in 1914, the prevailing system was the gold standard which was the epitome of the **fixed exchange rate system**. All currencies were defined in terms of gold; indeed some were actually made of gold. Each participant country committed to guarantee the free convertibility of its currency into gold at a fixed price. This meant that residents had, at their disposal, a domestic currency which was freely convertible at a fixed price into another asset (gold) acceptable in international payments. This also made it possible for each currency to be convertible into all others at a fixed price. Exchange rates were determined by its worth in terms of gold (where the currency was made of gold, its actual gold content). For example, if one unit of say currency A was worth one gram of gold, one unit of currency B was worth two grams of gold, currency B would be worth twice as much as currency A. Economic agents could directly convert one unit of currency B into two units of currency A, without having to first buy gold and then sell it. The rates would fluctuate between an upper and a lower limit, these limits being set by the costs of melting, shipping and recoining between the two Currencies [3]. To maintain the official parity each country needed an adequate stock of gold reserves. All countries on the gold standard had stable exchange rates.

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[3]If the difference in the rates were more than those transaction costs, profits could be made through arbitrage, the process of buying a currency cheap and selling it dear.

The question arose – would not a country lose all its stock of gold if it imported too much (and had a BoP deficit)? The mercantilist[4] explanation was that unless the state intervened, through tariffs or quotas or subsidies, on exports, a country would lose its gold and that was considered one of the worst tragedies. David Hume, a noted philosopher writing in 1752, refuted this view and pointed out that if the stock of gold went down, all prices and costs would fall commensurately and no one in the country would be worse off. Also, with cheaper goods at home, imports would fall and exports rise (it is the real exchange rate which will determine competitiveness). The country from which we were importing and making payments in gold would face an increase in prices and costs, so their now expensive exports would fall and their imports of the first country's now cheap goods would go up. The result of this price-specie-flow (precious metals were referred to as 'specie' in the eighteenth century) mechanism is normally to improve the BoP of the country losing gold, and worsen that of the country with the favourable trade balance, until equilibrium in international trade is re-established at relative prices that keep imports and exports in balance with no further net gold flow. The equilibrium is stable and self-correcting, requiring no tariffs and state action. Thus, fixed exchange rates were maintained by an automatic equilibrating mechanism.

Several crises caused the gold standard to break down periodically. Moreover, world price levels were at the mercy of gold discoveries. This can be explained by looking at the crude Quantity Theory of Money, $M = kPY$, according to which, if output (GNP) increased at the rate of 4 per cent per year, the gold supply would have to increase by 4 per cent per year to keep prices stable. With mines not producing this much gold, price levels were falling all over the world in the late nineteenth century, giving rise to social unrest. For a period, silver supplemented gold introducing 'bimetallism'. Also, **fractional reserve banking** helped to economise on gold. Paper currency was not entirely backed by gold; typically countries held one-fourth gold against its paper currency. Another way of economising on gold was the **gold exchange standard** which was adopted by many countries which kept their money exchangeable at fixed prices with respect to gold but held little or no gold. Instead of gold, they held the currency of some large country (the United States or the United Kingdom) which was on the gold standard. All these and the discovery of gold in Klondike and South Africa helped keep deflation at bay till 1929. Some economic historians attribute the Great Depression to this shortage of liquidity. During 1914-45, there was no maintained universal system but this period saw both a brief return to the gold standard and a period of flexible exchange rates.

The Bretton Woods System: The Bretton Woods Conference held in 1944 set up the International Monetary Fund (IMF) and the World Bank and reestablished a system of fixed exchange rates. This was different from the international gold standard in the choice of the asset in which national currencies would be convertible. A two-tier system of convertibility was established at the centre of which was the dollar. The US monetary authorities guaranteed the convertibility of the dollar into gold at the fixed price of $35 per ounce of gold. The second-tier of the system was the commitment of monetary authority of each IMF member participating in the system to convert their currency into dollars at a fixed price. The latter was called the official exchange rate. For instance, if French francs

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[4]Mercantilist thought was associated with the rise of the nation-state in Europe during the sixteenth and seventeenth centuries.
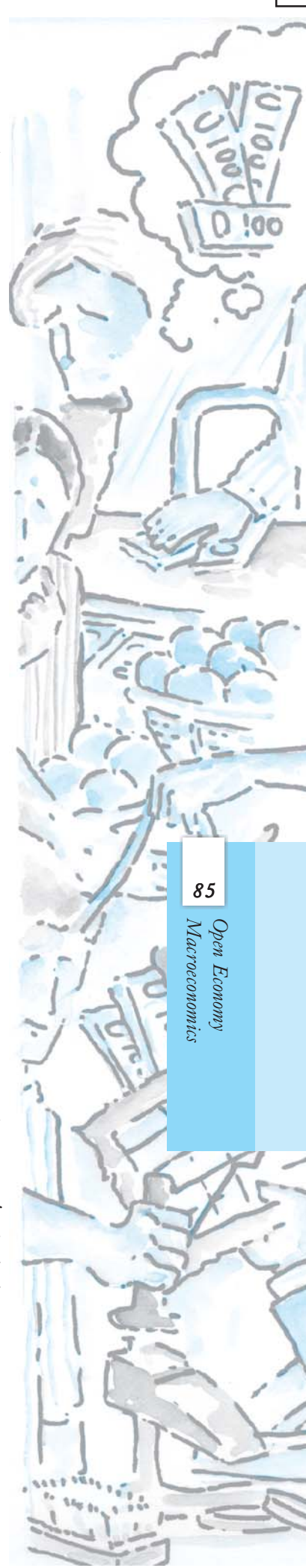
could be exchanged for dollars at roughly 5 francs per dollar, the dollars could then be exchanged for gold at $35 per ounce, which fixed the value of the franc at 175 francs per ounce of gold (5 francs per dollar times 35 dollars per ounce). A change in exchange rates was to be permitted only in case of a 'fundamental disequilibrium' in a nation's BoP – which came to mean a chronic deficit in the BoP of sizeable proportions.

Such an elaborate system of convertibility was necessary because the distribution of gold reserves across countries was uneven with the US having almost 70 per cent of the official world gold reserves. Thus, a credible gold convertibility of the other currencies would have required a massive redistribution of the gold stock. Further, it was believed that the existing gold stock would be insufficient to sustain the growing demand for international liquidity. One way to save on gold, then, was a two-tier convertible system, where the key currency would be convertible into gold and the other currencies into the key currency.

In the post-World War II scenario, countries devastated by the war needed enormous resources for reconstruction. Imports went up and their deficits were financed by drawing down their reserves. At that time, the US dollar was the main component in the currency reserves of the rest of the world, and those reserves had been expanding as a consequence of the US running a continued balance of payments deficit (other countries were willing to hold those dollars as a reserve asset because they were committed to maintain convertibility between their currency and the dollar).

The problem was that if the short-run dollar liabilities of the US continued to increase in relation to its holdings of gold, then the belief in the credibility of the US commitment to convert dollars into gold at the fixed price would be eroded. The central banks would thus have an overwhelming incentive to convert the existing dollar holdings into gold, and that would, in turn, force the US to give up its commitment. This was the Triffin Dilemma after Robert Triffin, the main critic of the Bretton Woods system. Triffin suggested that the IMF should be turned into a 'deposit bank' for central banks and a new 'reserve asset' be created under the control of the IMF. In 1967, gold was displaced by creating the Special Drawing Rights (SDRs), also known as 'paper gold', in the IMF with the intention of increasing the stock of international reserves. Originally defined in terms of gold, with 35 SDRs being equal to one ounce of gold (the dollar-gold rate of the Bretton Woods system), it has been redefined several times since 1974. At present, it is calculated daily as the weighted sum of the values in dollars of four currencies (euro, dollar, Japanese yen, pound sterling) of the five countries (France, Germany, Japan, the UK and the US). It derives its strength from IMF members being willing to use it as a reserve currency and use it as a means of payment between central banks to exchange for national currencies. The original installments of SDRs were distributed to member countries according to their quota in the Fund (the quota was broadly related to the country's economic importance as indicated by the value of its international trade).

The breakdown of the Bretton Woods system was preceded by many events, such as the devaluation of the pound in 1967, flight from dollars to gold in 1968 leading to the creation of a two-tiered gold market (with the official rate at $35 per ounce and the private rate market determined), and finally in August 1971, the British demand that US guarantee the gold value of its dollar holdings. This led to the US decision to give up the link between the dollar and gold.

The 'Smithsonian Agreement' in 1971, which widened the permissible band of movements of the exchange rates to 2.5 per cent above or below the new 'central rates' with the hope of reducing pressure on deficit countries, lasted only 14 months. The developed market economies, led by the United Kingdom and soon followed by Switzerland and then Japan, began to adopt floating exchange rates in the early 1970s. In 1976, revision of IMF Articles allowed countries to choose whether to float their currencies or to peg them (to a single currency, a basket of currencies, or to the SDR). There are no rules governing pegged rates and no *de facto* supervision of floating exchange rates.

The Current Scenario: Many countries currently have fixed exchange rates. Some countries peg their currency to the dollar. The creation of the European Monetary Union in January, 1999, involved permanently fixing the exchange rates between the currencies of the members of the Union and the introduction of a new common currency, the Euro, under the management of the European Central Bank. From January, 2002, actual notes and coins were introduced. So far, 12 of the 25 members of the European Union have adopted the euro. Some countries pegged their currency to the French franc; most of these are former French colonies in Africa. Others peg to a basket of currencies, with the weights reflecting the composition of their trade. Often smaller countries also decide to fix their exchange rates relative to an important trading partner. Argentina, for example, adopted the **currency board** system in 1991. Under this, the exchange rate between the local currency (the peso) and the dollar was fixed by law. The central bank held enough foreign currency to back all the domestic currency and reserves it had issued. In such an arrangement, the country cannot expand the money supply at will. Also, if there is a domestic banking crisis (when banks need to borrow domestic currency) the central bank can no longer act as a lender of last resort. However, following a crisis, Argentina abandoned the currency board and let its currency float in January 2002.

Another arrangement adopted by Equador in 2000 was dollarisation when it abandoned the domestic currency and adopted the US dollar. All prices are quoted in dollar terms and the local currency is no longer used in transactions. Although uncertainty and risk can be avoided, Equador has given the control over its money supply to the Central Bank of the US – the Federal Reserve – which will now be based on economic conditions in the US.

On the whole, the international system is now characterised by a multiple of regimes. Most exchange rates change slightly on a day-to-day basis, and market forces generally determine the basic trends. Even those advocating greater fixity in exchange rates generally propose certain ranges within which governments should keep rates, rather than literally fix them. Also, there has been a virtual elimination of the role for gold. Instead, there is a free market in gold in which the price of gold is determined by its demand and supply coming mainly from jewellers, industrial users, dentists, speculators and ordinary citizens who view gold as a good store of value.

6.3 THE DETERMINATION OF INCOME IN AN OPEN ECONOMY

With consumers and firms having an option to buy goods produced at home and abroad, we now need to distinguish between domestic demand for goods and the demand for domestic goods.
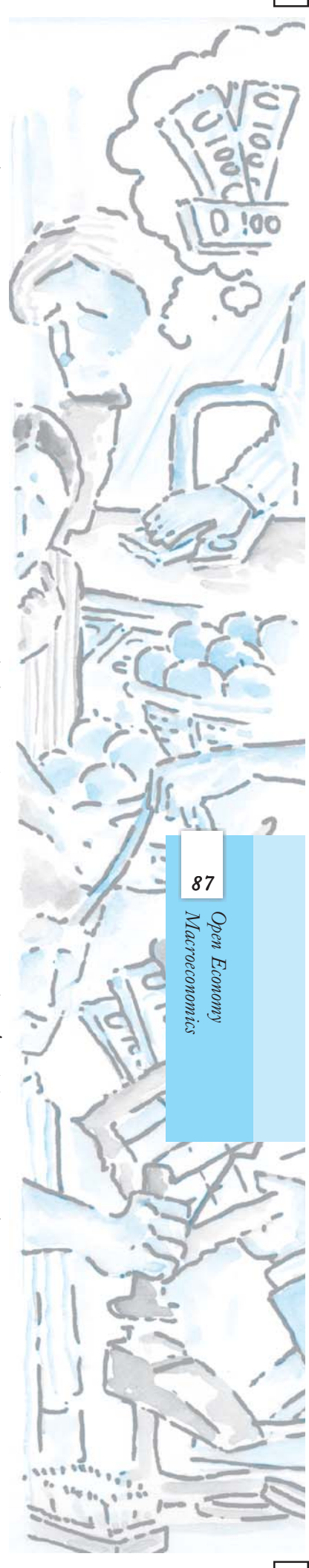
6.3.1 National Income Identity for an Open Economy

In a closed economy, there are three sources of demand for domestic goods – Consumption (C), government spending (G), and domestic investment (I). We can write

$$Y = C + I + G \tag{6.2}$$

In an open economy, exports (X) constitute an additional source of demand for domestic goods and services that comes from abroad and therefore must be added to aggregate demand. Imports (M) supplement supplies in domestic markets and constitute that part of domestic demand that falls on foreign goods and services. Therefore, the national income identity for an open economy is

$$Y + M = C + I + G + X \tag{6.3}$$

Rearranging, we get

$$Y = C + I + G + X - M \tag{6.4}$$

or

$$Y = C + I + G + NX \tag{6.5}$$

where, NX is **net exports** (exports – imports). A positive NX (with exports greater than imports) implies a trade surplus and a negative NX (with imports exceeding exports) implies a trade deficit.

To examine the roles of imports and exports in determining equilibrium income in an open economy, we follow the same procedure as we did for the closed economy case – we take investment and government spending as autonomous. In addition, we need to specify the determinants of imports and exports. The demand for imports depends on domestic income (Y) and the real exchange rate (R). Higher income leads to higher imports. Recall that the real exchange rate is defined as the relative price of foreign goods in terms of domestic goods. A higher R makes foreign goods relatively more expensive, thereby leading to a decrease in the quantity of imports. Thus, imports depend positively on Y and negatively on R. The export of one country is, by definition, the import of another. Thus, our exports would constitute foreign imports. It would depend on foreign income, Y_f, and on R. A rise in Y_f will increase foreign demand for our goods, thus leading to higher exports. An increase in R, which makes domestic goods cheaper, will increase our exports. Exports depend positively on foreign income and the real exchange rate. Thus, exports and imports depend on domestic income, foreign income and the real exchange rate. We assume price levels and the nominal exchange rate to be constant, hence R will be fixed. From the point of view of our country, foreign income, and therefore exports, are considered exogenous ($X = \bar{X}$).

The demand for imports is thus assumed to depend on income and have an autonomous component

$$M = \bar{M} + mY, \text{ where } \bar{M} > 0 \text{ is the autonomous component, } 0 < m < 1. \tag{6.6}$$

Here m is the **marginal propensity to import**, the fraction of an extra rupee of income spent on imports, a concept analogous to the marginal propensity to consume.

The equilibrium income would be

$$Y = \bar{C} + c(Y - T) + \bar{I} + \bar{G} + \bar{X} - \bar{M} - mY \tag{6.7}$$

Taking all the autonomous components together as $\bar{A}$, we get

$$Y = \bar{A} + cY - mY \tag{6.8}$$

or, $(1 - c + m)Y = \bar{A}$ (6.9)

or, $Y^* = \dfrac{1}{1-c+m}\bar{A}$ (6.10)

In order to examine the effects of allowing for foreign trade in the income-expenditure framework, we need to compare equation (6.10) with the equivalent expression for the equilibrium income in a closed economy model. In both equations, equilibrium income is expressed as a product of two terms, the autonomous expenditure multiplier and the level of autonomous expenditures. We consider how each of these change in the open economy context.

Since m, the marginal propensity to import, is greater than zero, we get a smaller multiplier in an open economy. It is given by

The open economy multiplier = $\dfrac{\Delta Y}{\Delta \bar{A}} = \dfrac{1}{1-c+m}$ (6.11)

If $c = 0.8$ and $m = 0.3$, we would have the open and closed economy multiplier respectively as

$$\dfrac{1}{1-c} = \dfrac{1}{1-0.8} = \dfrac{1}{0.2} = 5$$ (6.12)

and

$$\dfrac{1}{1-c+m} = \dfrac{1}{1-0.8+0.3} = \dfrac{1}{0.5} = 2$$ (6.13)

If domestic autonomous demand increases by 100, in a closed economy output increases by 500 whereas it increases by only 200 in an open economy.

The fall in the value of the autonomous expenditure multiplier with the opening up of the economy can be explained with reference to our previous discussion of the multiplier process (Chapter 4). A change in autonomous expenditures, for instance a change in government spending, will have a direct effect on income and an induced effect on consumption with a further effect on income. With an mpc greater than zero, a proportion of the induced effect on consumption will be a demand for foreign, not domestic goods. Therefore, the induced effect on demand for domestic goods, and hence on domestic income, will be smaller. The increase in imports per unit of income constitutes an additional leakage from the circular flow of domestic income at each round of the multiplier process and reduces the value of the autonomous expenditure multiplier.

The second term in equation (6.10) shows that, in addition to the elements for a closed economy, autonomous expenditure for an open economy includes the level of exports and the autonomous component of imports. Thus, the changes in their levels are additional shocks that will change equilibrium income. From equation (6.10) we can compute the multiplier effects of changes in $\bar{X}$ and $\bar{M}$.

$$\dfrac{\Delta Y^*}{\Delta \bar{X}} = \dfrac{1}{1-c+m}$$ (6.14)

$$\dfrac{\Delta Y^*}{\Delta \bar{M}} = \dfrac{-1}{1-c+m}$$ (6.15)

An increase in demand for our exports is an increase in aggregate demand for domestically produced output and will increase demand just as would an
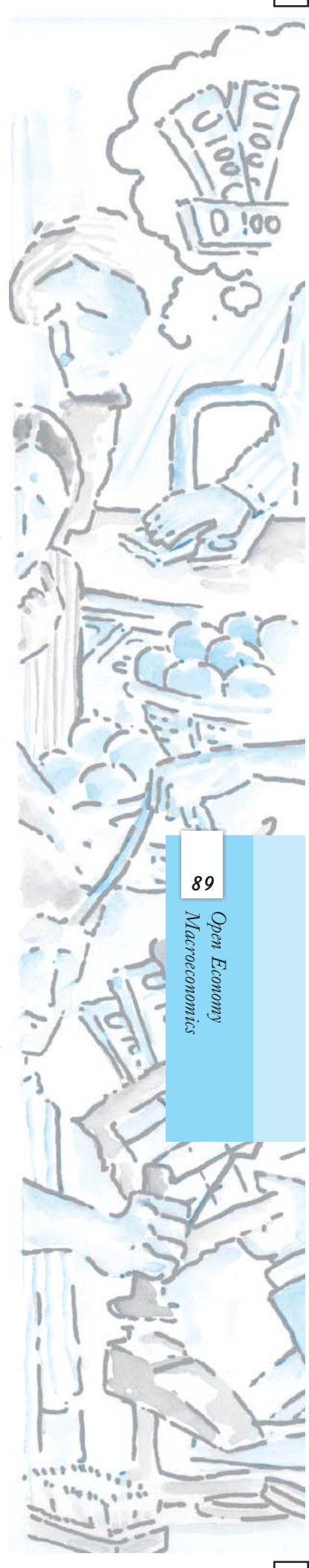
increase in government spending or an autonomous increase in investment. In contrast, an autonomous rise in import demand is seen to cause a fall in demand for domestic output and causes equilibrium income to decline.

6.3.2 Equilibrium Output and the Trade Balance

We shall provide a diagrammatic explanation of the above mechanisms and, in addition, their impact on the trade balance. Net exports, $(NX = X - M)$, as we saw earlier, depend on Y, Y_f and R. A rise in Y raises import spending and leads to trade deficit (if initially we had trade balance, $NX = 0$). A rise in Y_f, other things being equal, raises our exports, creates a trade surplus and raises aggregate income. A real depreciation would raise exports and reduce imports, thus increasing our net exports.

In the upper panel of Fig. 6.4, the line AD plots domestic demand, $C+I+G$, as a function of income (the familiar closed economy relation of Chapter 5). Under our standard assumptions, its slope is positive but less than one. To get the demand for domestic goods, we first subtract imports obtaining the line AA. The distance between AD and AA is equal to the value of imports, M. Because the quantity of imports increases with income, the distance between the two lines increases with income. AA is flatter than AD because as income increases, some of the additional domestic demand falls on foreign

Fig. 6.4

Aggregate Demand in an Open Economy and the net Export Schedule

goods. Thus, with an increase in income, the domestic demand for domestic goods increases less than total domestic demand. Second, we add exports and get the line DD, which is above AA. The distance between DD and AA is equal to exports and remains constant because exports do not depend on domestic income (the two lines are parallel). Now, the open economy aggregate demand curve, DD, is flatter than the closed economy one (because AA is flatter than AD).

In lower panel of Fig. 6.4, we examine the behaviour of net exports, NX, as a function of income. For example, at income level Y, exports are given by the distance AC and imports by the distance AB, so that net exports are given by the distance BC.

Net exports are a decreasing function of domestic income. As income increases, imports increase and exports are unaffected leading to lower net exports. At Y_{tb} ('tb' for trade balance), the level of income at which the value of
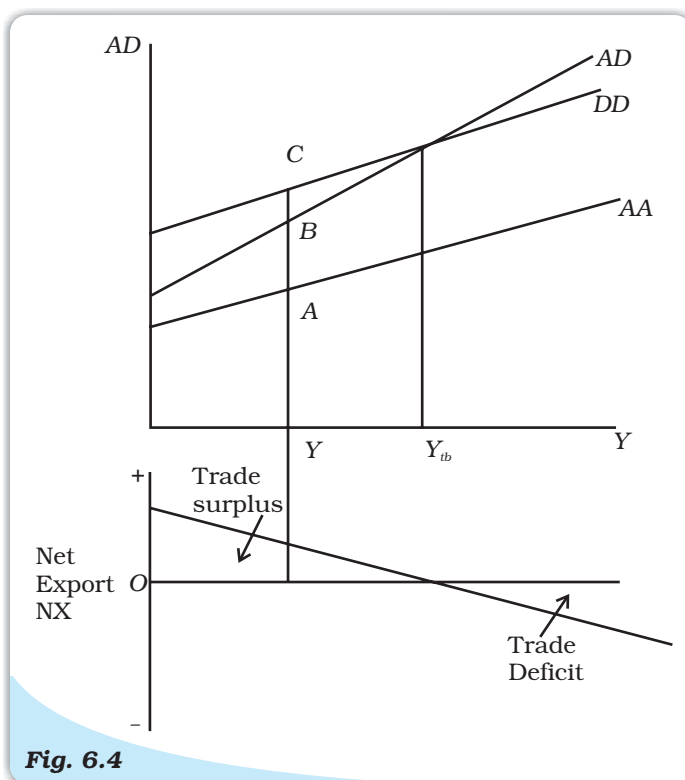
imports is just equal to exports, net exports are equal to zero. Levels of income above Y_{tb} lead to higher imports, and thus a trade deficit. Levels of income below Y_{tb} lead to lower imports, and thus to a trade surplus.

The goods market is in equilibrium when the supply of domestic output is equal to the demand for domestic output, at point E in Fig.6.5 at the intersection of the line DD with the 45-degree line. There is no reason for the equilibrium level of output, Y^*, to be the same as the level of output at which trade is balanced, Y_{tb}. In Fig. 6.5, equilibrium output is associated with a trade deficit equal to the distance BC.

To examine the effects of an increase in autonomous expenditure (say, G), we assume a situation when, at the equilibrium level of income, Y, trade is balanced, so that Y and Y_{tb} are the same. If the government increases spending, as shown in Fig. 6.6, the aggregate demand line moves up from DD to DD', and equilibrium moves up from E to E' and income increases from Y to Y'. The NX schedule as a function of output does not shift as G does not enter the X or M relation directly. The increase in output is clearly larger than the increase in G, there is a multiplier effect. This is similar to the closed economy case, only that the multiplier is smaller. The DD curve is flatter than the closed economy AD curve.

However, the increase in output from Y to Y' leads to a trade deficit equal to BC. The trade deficit and the smaller multiplier both arise from the same cause – an increase in demand now falls not only on
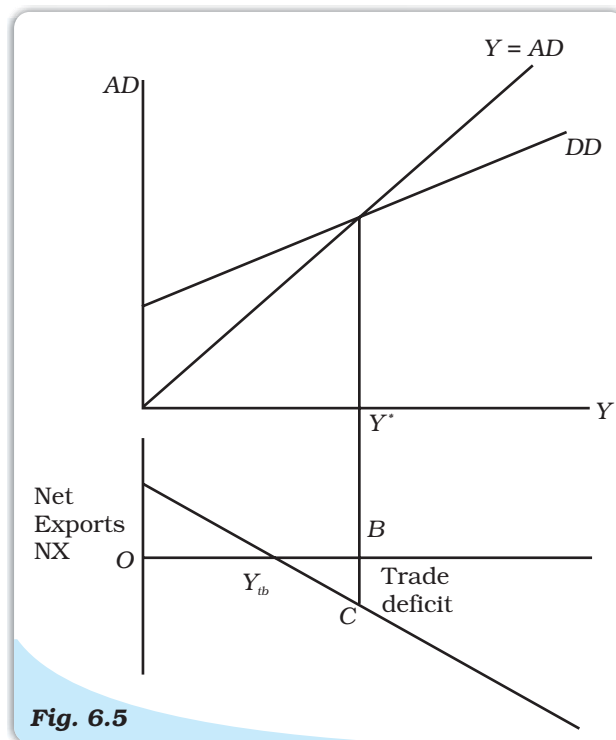

Fig. 6.5
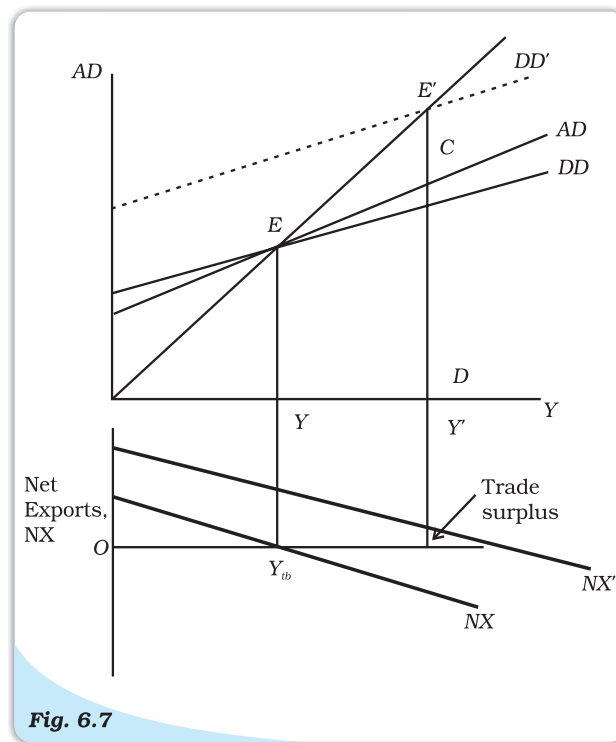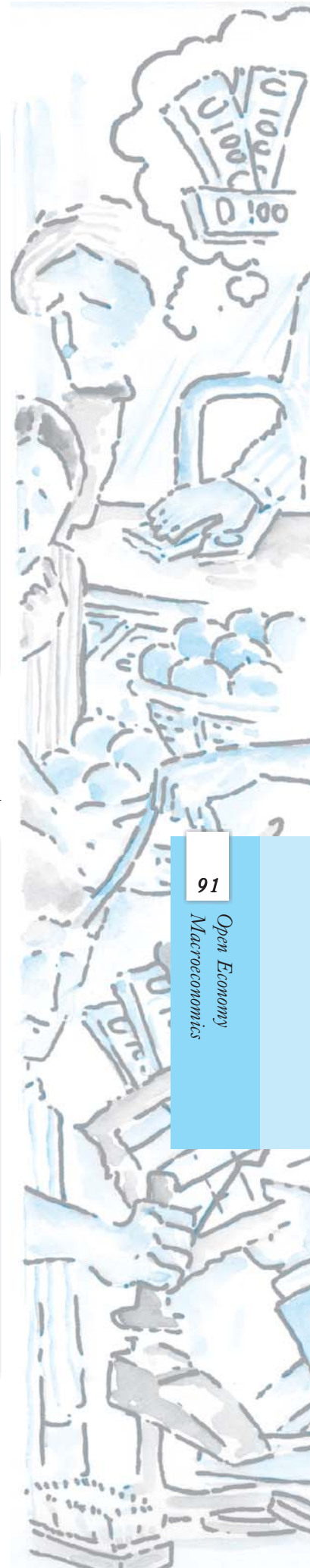
Equilibrium Income and Net Exports

Fig. 6.7

Effect of Higher Government Spending

domestic goods but also on foreign goods. This, as explained earlier, leads to a smaller multiplier. And because some of the increase falls on imports and exports remain unchanged, the result is a trade deficit.

These two implications are important. The more open the economy, the smaller the effect on income and the larger the adverse effect on the trade balance. For example, suppose a country has a ratio of imports to GDP of around 70 per cent. This implies that when demand increases, roughly 70 per cent of this increased demand goes to higher imports and only 30 per cent to an increase in demand for domestic goods. An increase in G is thus likely to result in a large increase in the country's trade deficit and a small increase in output and income, making domestic demand expansion an unattractive policy for the country.

Interdependent Incomes – Increase in Foreign Demand: We have so far assumed that foreign income, prices and exchange rate remain unchanged. First, we consider an increase in foreign income, Y_f, keeping prices and the exchange rate fixed. The initial demand for domestic goods is given by DD in Fig. 6.7. The equilibrium is at point E, with output level Y. We assume that initially trade is balanced so that net exports associated with Y are equal to zero.

As was explained in Fig. 6.4., the line AD is steeper than DD, the difference is equal to net exports so that if trade is balanced at E, DD intersects AD at E. The direct effect of an increase in Y_f is to increase exports. For a given level of domestic income, this increases demand for domestic goods so that DD shifts up to DD'. As exports increase at a given level of income the net exports line also increases to NX'. The new equilibrium is at point E', with net output level Y'. The increase in Y_f leads to an increase in domestic income through the multiplier.
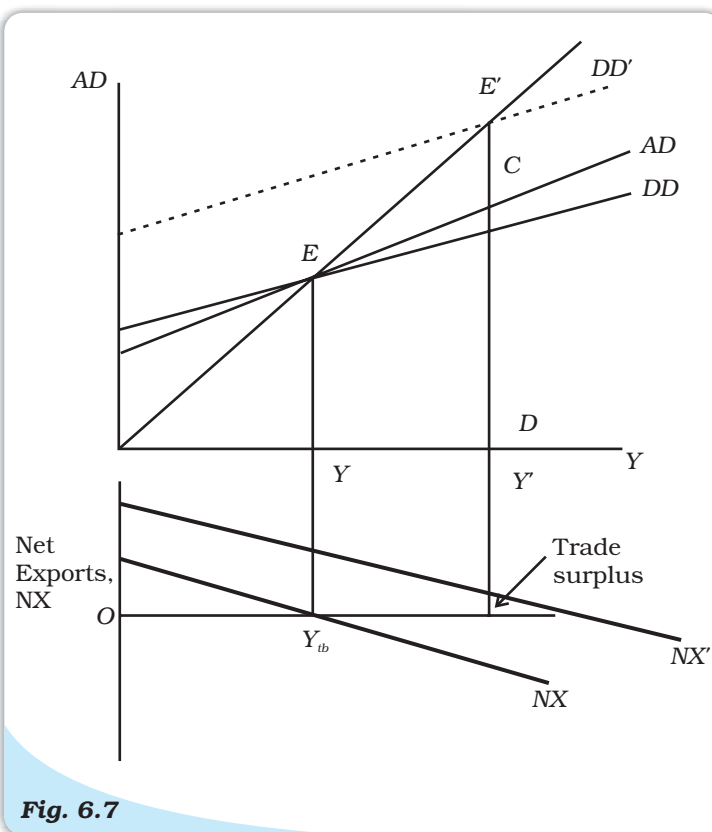

Fig. 6.7

The Effects of Higher Foreign Demand

What happens to the trade balance? If the increase in Y leads to a large increase in imports, the trade balance could deteriorate. But it does not. At the new level of income, domestic demand is given by DE'. Net exports are thus given by CE' – which, because AD is necessarily below DD', is necessarily positive. Thus, while imports increase, they do not offset the increase in exports, and there is a trade surplus. Coversely, a recession abroad would reduce domestic exports and cause a trade deficit. Thus, booms and recessions in one country tend to be transmitted to other countries through international trade in goods and services.

Change in Prices: Next we consider the effects of changes in prices, assuming the exchange rate to be fixed. If prices of domestic products fall, while say foreign prices remain constant, domestic exports will rise, adding to aggregate demand, and hence will raise our output and income. Analogously, a rise in prices of a country's exports will decrease that country's net exports and output and income. Similarly, a price increase abroad will make foreign products more expensive and hence again raise net exports and domestic output and income. Price decreases abroad have the opposite effects.

Exchange Rate Changes: Changes in nominal exchange rates would change the real exchange rate and hence international relative prices. A depreciation of the rupee will raise the cost of buying foreign goods and make domestic goods less costly. This will raise net exports and therefore increase aggregate demand. Conversely, a currency appreciation would reduce net exports and, therefore, decrease aggregate demand. However, we must note that international trade patterns take time to respond to changes in exchange rates. A considerable period of time may elapse before any improvement in net exports is apparent.

6.4 TRADE DEFICITS, SAVINGS AND INVESTMENT

The question arises – are trade deficits a cause for alarm? We note that an essential difference between a closed economy and an open economy is that while in a closed economy saving and investment must always be equal, in an open economy, they can differ. From equation (6.5) we get

$$Y - C - G = I + NX \qquad (6.16)$$

or

$$S = I + NX \qquad (6.17)$$

We distinguish between private saving, S^p, (that part of disposable income that is saved rather than consumed — $Y - T - C$) and government saving, S^g, (government's 'income', its net tax revenue minus its 'consumption', government purchases, $T - G$). The two together add up to national saving
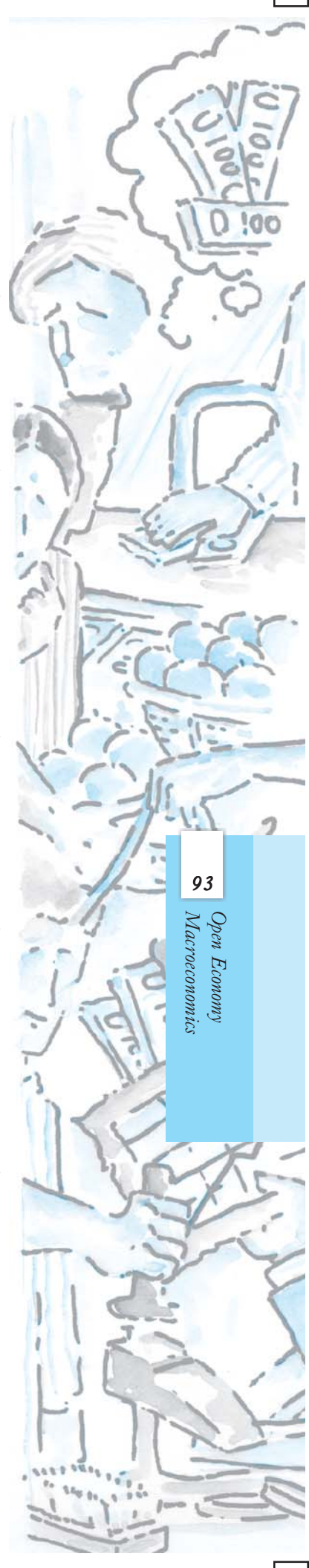
$$S = Y - C - G = (Y - T - C) + (T - G) = S^p + S^g \qquad (6.18)$$

Thus, from (6.16) and (6.17), we get

$$S = S^p + S^g = I + NX$$

or

$$NX = (S^p - I) + S^g = (S^p - I) + (T - G) \qquad (6.19)$$

When a country runs a trade deficit[5], it is important to look at the right side of equation (6.18) to see whether there has been a decrease in saving, increase in investment, or an increase in the budget deficit. There is reason to worry about a country's long-run prospects if the trade deficit reflects smaller saving or a larger budget deficit (when the economy has both trade deficit and budget deficit, it is said to be facing twin deficits). The deficit could reflect higher private or government consumption. In such cases, the country's capital stock will not rise rapidly enough to yield enough growth (called the 'growth dividend') it needs to repay its debt. There is less cause to worry if the trade deficit reflects a rise in investment, which will build the capital stock more quickly and increase future output. However, we must note that since private saving, investment and the trade deficit are jointly determined, other factors too must be taken into account.

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[5]Here,to simplify the analysis, we take trade balance to be synonymous with the current account balance, ignoring invisibles and transfer payments. As Table 6.1 shows, invisibles can help bridge the trade deficit in an important way.

Summary

1. Openness in product and financial markets allows a choice between domestic and foreign goods and between domestic and foreign assets.
2. The BoP records a country's transactions with the rest of the world.
3. The current account balance is the sum of the balance of merchandise trade, services and net transfers received from the rest of the world. The capital account balance is equal to capital flows from the rest of the world, minus capital flows to the rest of the world.
4. A current account deficit is financed by net capital flows from the rest of the world, thus by a capital account surplus.
5. The nominal exchange rate is the price of one unit of foreign currency in terms of domestic currency.
6. The real exchange rate is the relative price of foreign goods in terms of domestic goods. It is equal to the nominal exchange rate times the foreign price level divided by the domestic price level. It measures the international competitiveness of a country in international trade. When the real exchange rate is equal to one, the two countries are said to be in purchasing power parity.
7. The epitome of the fixed exchange rate system was the gold standard in which each participant country committed itself to convert freely its currency into gold at a fixed price. The pegged exchange rate is a policy variable and may be changed by official action (devaluation).
8. Under clean floating, the exchange rate is market-determined without any central bank intervention. In case of managed floating, central banks intervene to reduce fluctuations in the exchange rate.
9. In an open economy, the demand for domestic goods is equal to the domestic demand for goods (consumption, investment and government spending) plus exports minus imports.
10. The open economy multiplier is smaller than that in a closed economy because a part of domestic demand falls on foreign goods. An increase in autonomous demand thus leads to a smaller increase in output compared to a closed economy. It also results in a deterioration of the trade balance.
11. An increase in foreign income leads to increased exports and increases domestic output. It also improves the trade balance.
12. Trade deficits need not be alarming if the country invests the borrowed funds yielding a rate of growth higher than the interest rate.

Introductory Macroeconomics

Box 6.1: Exchange Rate Management: The Indian Experience

India's exchange rate policy has evolved in line with international and domestic developments. Post-independence, in view of the prevailing Bretton Woods system, the Indian rupee was pegged to the pound sterling due to its historic links with Britain. A major development was the devaluation of the rupee by 36.5 per cent in June, 1966. With the breakdown of the Bretton Woods system, and also the declining share of UK in India's trade, the rupee was delinked from the pound sterling in September 1975. During the period between 1975 to 1992, the exchange rate of the rupee was officially determined by the Reserve Bank within a nominal band of plus or minus 5 per cent of the weighted basket of currencies of India's major trading partners. The Reserve Bank intervened on a day-to-day basis which resulted in wide changes in the size of reserves. The exchange rate regime of this period can be described as an adjustable nominal peg with a band.

The beginning of 1990s saw significant rise in oil prices and suspension of remittances from the Gulf region in the wake of the Gulf crisis. This, and other domestic and international developments, led to severe balance of payments problems in India. The drying up of access to commercial banks and short-term credit made financing the current account deficit difficult. India's foreign currency reserves fell rapidly from US $ 3.1 billion in August to US $ 975 million on July 12, 1991 (we may contrast this with the present; as of January 27, 2006, India's foreign exchange reserves stand at US $ 139.2 billion). Apart from measures like sending gold abroad, curtailing non-essential imports, approaching the IMF and multilateral and bilateral sources, introducing stabilisation and structural reforms, there was a two-step devaluation of 18–19 per cent of the rupee on July 1 and 3, 1991. In march 1992, the Liberalised Exchange Rate Management System (LERMS) involving dual exchange rates was introduced. Under this system, 40 per cent of exchange earnings had to be surrendered at an official rate determined by the Reserve Bank and 60 per cent was to be converted at the market-determined rates.The dual rates were converged into one from March 1, 1993; this was an important step towards current account convertibility, which was finally achieved in August 1994 by accepting Article VIII of the Articles of Agreement of the IMF. The exchange rate of the rupee thus became market determined, with the Reserve Bank ensuring orderly conditions in the foreign exchange market through its sales and purchases.
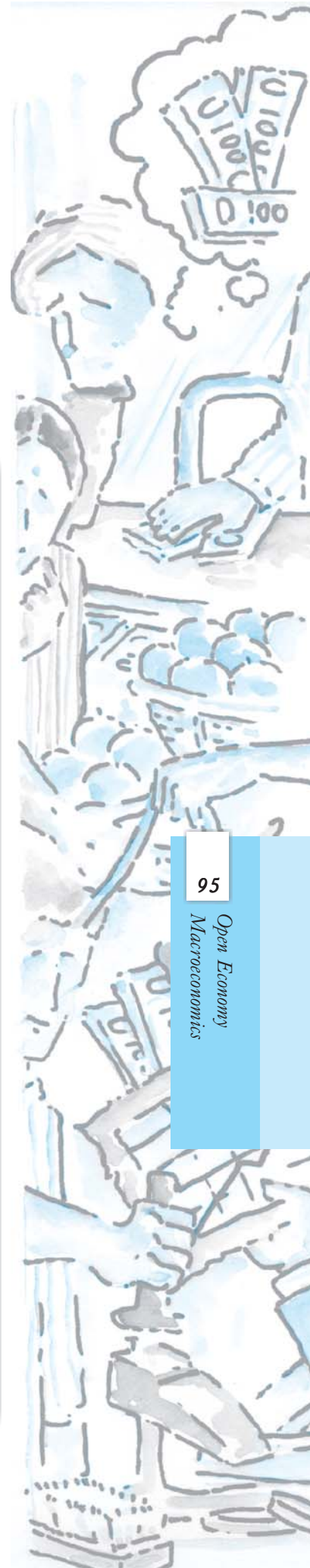
1. Differentiate between balance of trade and current account balance.

2. What are official reserve transactions? Explain their importance in the balance of payments.

3. Distinguish between the nominal exchange rate and the real exchange rate. If you were to decide whether to buy domestic goods or foreign goods, which rate would be more relevant? Explain.

4. Suppose it takes 1.25 yen to buy a rupee, and the price level in Japan is 3 and the price level in India is 1.2. Calculate the real exchange rate between India and Japan (the price of Japanese goods in terms of Indian goods). (**Hint:** First find out the nominal exchange rate as a price of yen in rupees).

5. Explain the automatic mechanism by which BoP equilibrium was achieved under the gold standard.

6. How is the exchange rate determined under a flexible exchange rate regime?

7. Differentiate between devaluation and depreciation.

8. Would the central bank need to intervene in a managed floating system? Explain why.

9. Are the concepts of demand for domestic goods and domestic demand for goods the same?

10. What is the marginal propensity to import when $M = 60 + 0.06Y$? What is the relationship between the marginal propensity to import and the aggregate demand function?

11. Why is the open economy autonomous expenditure multiplier smaller than the closed economy one?

12. Calculate the open economy multiplier with proportional taxes, $T = tY$, instead of lump-sum taxes as assumed in the text.

13. Suppose $C = 40 + 0.8Y\,D$, $T = 50$, $I = 60$, $G = 40$, $X = 90$, $M = 50 + 0.05Y$ (a) Find equilibrium income. (b) Find the net export balance at equilibrium income (c) What happens to equilibrium income and the net export balance when the government purchases increase from 40 and 50?

14. In the above example, if exports change to $X = 100$, find the change in equilibrium income and the net export balance.

15. Explain why $G - T = (S^g - I) - (X - M)$.

16. If inflation is higher in country A than in Country B, and the exchange rate between the two countries is fixed, what is likely to happen to the trade balance between the two countries?

17. Should a current account deficit be a cause for alarm? Explain.

18. Suppose $C = 100 + 0.75Y\,D$, $I = 500$, $G = 750$, taxes are 20 per cent of income, $X = 150$, $M = 100 + 0.2Y$. Calculate equilibrium income, the budget deficit or surplus and the trade deficit or surplus.

19. Discuss some of the exchange rate arrangements that countries have entered into to bring about stability in their external accounts.

Suggested Readings

1. Dornbusch, R. and S. Fischer, 1994. *Macroeconomics*, sixth edition, McGraw-Hill, Paris.

2. *Economic Survey*, Government of India, 2006-07.

3. Krugman, P.R. and M. Obstfeld, 2000. *International Economics, Theory and Policy*, fifth edition, Pearson Education.

Table 6.1: Balance of Payments : Summary # (in US $ million)

		1990 -91	1989 -99	2000 -01	2001 -02	2002 -03	2003 -04
1.	Exports	18,477	34,298	45,452	44,703	53,774	66,285
2.	Imports	27,915	47,544	57,912	56,277	64,464	80,003
	of which POL	6,028	6,399	15,650	14,000	17,640	20,569
3.	Trade balance	–9,438	–13,246	–12,460	–11,574	–10,690	–13,718
4.	Invisibles (net)	–242	9,208	9,794	14,974	17,035	27,801
	Non-factor services	980	2,165	1,692	3,324	3,643	10,144
	Income	–3,752	–3,544	–5,004	–4,206	–3,446	–4,505
	Pvt. transfers	2,069	10,280	12,854	15,398	16,387	21,608
	Official transfers	461	307	252	458	451	554
5.	Current Account Balance	–9,680	–4,038	–2,666	3,400	6,345	14,083
6.	External assistance (net)	2,204	799	410	1,117	–3,128	–2,858
7.	Commercial borrowings (net)	2,254	4,367	4,303	–1,585	–1,692	–2,925
8.	IMF (net)	1,214	–393	–26	0	0	0
9.	NR deposits (net)	1,536	961	2,316	2,754	2,978	3,642
10.	Rupee debt service	–1,192	–802	–617	–519	–474	–376
11.	Foreign investment (net)	101	2,312	5,862	6,686	4,161	13,744
	of which						
	(i) FDI(net)	96	2,380	3,272	4,734	3,217	2,388
	(ii) FIIs	0	–390	1,847	1,505	377	10,918
	(iii) Euro equities & others	5	322	743	447	567	438
12.	Other flows (net)+	2,284	623	–3,739	–96	8,795	6,111
13.	Capital account total (net)	8,401	7,867	8,509	8,357	10,640	17,338
14.	Reserve use (–increase)	1,279	–3,829	–5,842	–11,757	–16,985	–31,421

Source: *Economic Survey*, 2005-06.