ECS3703 - INTERNATIONAL FINANCE – S1 - 2015

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ECS3703 - INTERNATIONAL FINANCE

STUDY UNIT 1 – THE BALANCE OF PAYMENTS

1.1 INTRODUCTION

This study unit reviews the terminology and interpretation of a country's balance of payments, as set out in the prescribed book. Because the discussion there is mostly descriptive, it is not necessary to repeat in different words what is described there. Note that this supplementary reading is included for examination purposes.

1.2 WHAT IS THE BALANCE OF PAYMENTS?

The balance of payments is an accounting summary or statement of the various transactions that have taken place between a country and its trading partners over a period of time, usually a year. Such transactions are normally aggregated according to the type of exchanges that have occurred – for example, whether the transaction represents a trade in goods, services or an exchange of financial assets or claims. However, other aggregations are also possible, along, say, geographic lines.
We should guard against confusing the balance of payments with the concept of a national balance sheet.

- A **national balance sheet** is a summary- aggregated statement of a country's assets and liabilities, which is similar to a firm's balance sheet.
- The ***balance* of payments** is more like a company income statement than a balance sheet. It is a record of the monetary values of the various flows of goods, services and financial assets between countries rather than a measure of the existing national stocks thereof.

The two measures are related – just as the flow of water from a tap will alter the level (stock) of water in a bath so, for example, the net flows of foreign exchange resulting from international transactions lead to a change in a country's stock of foreign exchange reserves.

1.3 THE SOUTH AFRICAN BALANCE OF PAYMENTS

Three main divisions are usually present:

1. The current account,
2. The capital or **financial account** and
3. The change in official net foreign exchange reserves.

Table 1.1: Balance of payments[1]
Annual figures
R millions Source: Quarterly Bulletin of the South African Reserve Bank, March 2010

	2002	2003	2004	2005	2006	2007	2008	2009
Current account								
Merchandise exports, free on board[2]	289 608	259 328	281 827	331 338	412 220	493 893	655 759	503 656
Net gold exports[3]	43 643	32 106	28 698	27 023	35 470	39 898	48 534	52 776
Service receipts	52 309	63 351	63 425	71 808	82 643	97 111	105 352	100 681
Income receipts	22 711	21 373	20 973	29 550	41 207	48 448	48 254	34 075
Less: Merchandise imports, free on board[2]	283 004	264 752	311 759	360 362	476 966	574 322	739 852	554 161
Less: Payments for services	57 632	60 283	66 420	77 197	96 623	115 740	138 684	123 579
Less: Income payments	52 111	56 244	48 823	60 975	75 982	117 266	122 129	87 593
Current transfers (net receipts +)	-5 844	–7 478	-10 869	-15 680	-15 768	-16 575	-18 909	-22 428
Balance on current account	9 680	-12 599	-42 948	-54 495	-93 799	-144 553	-161 675	-96 573
Capital transfer account (net receipts +)	-163	327	338	193	205	197	208	216

Financial account	2002	2003	2004	2005	2006	2007	2008	2009
Direct investment								
Liabilities[4]	16540	5 550	5 155	42 270	-3 567	40 120	74 403	48 270
Assets[5]	4195	-4 275	-8 721	-5 916	-41 058	-20 896	25 888	-13 425
Net direct investment	20735	1 275	-3 566	36 354	-44 625	1 9 224	100 291	34 845
Portfolio investment								
Liabilities	5344	7 548	46 262	36 188	144 501	97 485	-71 540	107 190
Assets	-9619	-1 001	-5 946	-6 123	-15 044	-24 026	-63 325	-14 721
Net portfolio investment	-4275	6 547	40 316	30 065	129 457	73 459	-134 865	92 469
Other investment								
Liabilities	304	14 594	10 944	32 735	60 750	58 711	47 730	-42 323
Assets	-4329	-36 919	-3 555	-22 895	-38 823	2 119	82 983	20 677
Net other investment	-4025	-22 325	7 389	9 840	21 927	60 830	130 713	-21 646
Balance on financial account	**12435**	**-14 503**	**44 139**	**76 259**	**106 759**	**153 513**	**96 139**	**105 668**
Unrecorded transactions[5]	-5872	21 917	35 999	12 306	16 627	38 659	91 394	7 726

	2002	2003	2004	2005	2006	2007	2008	2009
Change in net gold and other foreign reserves owing to balance of payments transactions	**16 080**	**-4 858**	**37 528**	**34 263**	**29 792**	**47 816**	**26 066**	**17 037**
Change in liabilities related to reserves[7]	-20 090	1 911	2 949	2 577	-5 453	-7 631	-7 761	-2 724
SDR allocations and valuation adjustments	-20 041	-11 262	-10 617	11 003	23 350	5 642	74 214	-38 647
Net monetisation (+) / demonetisations(-) of gold	-563	1 137	84	-226	163	169	158	45
Change in gross gold and other foreign reserves	**24 614**	**-13 072**	**29 944**	**47 617**	**47 852**	**45 996**	**92 677**	**-24 289**
Memo item: change in capital transfer and financial accounts including unrecorded transactions	6 400	7 741	80 476	88 758	123 591	192 369	187 741	113 610

1. Data for the previous four years are preliminary and subject to revision.
2. Published customs figures adjusted for balance of payments purposes.
3. Commodity gold. Prior to 1981, net gold exports comprised net foreign sales of gold plus changes in gold holdings of the South African Reserve Bank and other banking institutions.
4. Investment by foreigners in undertakings in South Africa in which they have individually or collectively, in the case of affiliated organisations or persons, at least 10 per cent of the voting rights.
5. Investment by South African residents in undertakings abroad in which they have at least 10 per cent of the voting rights.
6. Transactions on the current, capital transfer and financial accounts.
7. Liabilities related to foreign reserves include all foreign liabilities of the Reserve Bank and short-term loans to the central government by international organisations.

1.3.1 The current account

The **current account** may be subdivided into

- the trade account, net service receipts,
- net income receipts and
- The current transfers.

The trade account comprises trade in physical goods. The trade balance is not shown explicitly in the South African balance of payments but can easily be calculated by subtracting the value of merchandise imports from the value of merchandise exports and net gold exports. Because of South Africa's historical dependence on gold exports, the trade account is recorded as a separate item immediately below merchandise exports.

In table 1.1, South Africa's trade balance for 2008 may be calculated by subtracting merchandise imports to the value of R739 852 m from the value of merchandise exports plus net gold exports (R655 759 m + R48 534 m) to the value of R704 293 m, which thus equals R-35 559 m. Note the declining **relative** contribution of gold exports to the balance of trade.

Net gold exports as a percentage of merchandise exports fell from 12.4 to 7.4 per cent during the period, 2001 to 2008. In 1989 (not shown in table 1.1), gold exports comprised nearly **half (50 per cent)** of all merchandise exports. Clearly, the recent decline is more than a temporary phenomenon and may be regarded as a continuation of a long-term trend.

One of the concerns about the South African economy is the large deficit on the country's current account. This deficit mushroomed from R-12 599 m in 2003 to a massive R-161 675 m in 2008. This huge and increasing deficit is largely a result of the growth in *merchandise imports*. A deficit on the current account means in fact that South Africans borrow in order to spend.

The main service items are transport of goods and passengers between countries, freight and merchandise insurance, other financial services, various business, professional and technical services, government services and foreign travel. The main income items are **interest, dividends** and **foreign branch profits**. The net deficit as regards income receipts and payments is to be expected of a developing country like South Africa, in which inward foreign investment (and thus the interest and dividend returns on such investment) greatly exceeds outward foreign investment by South African firms and individuals.

Why, you might ask, are interest, dividends and net foreign profits included under the current account and not the financial account? The reason is that interest, dividends and foreign company profits are properly regarded as ongoing (foreign) investment **income** flows derived from prior investments of **capital** abroad. Such income flows belong to the current account. Only adjustments made to desired levels or **stocks** of domestic versus foreign capital investments (requiring the exchange of asset claims) are included under financial account transactions.

South Africa generally experiences a negative balance of net current transfers. This item comprises foreign payments and receipts of government social security payments and taxes, private transfers of income (such as gifts, donations and immigration funds) and the like. Current transfers are treated separately from capital transfers. The latter comprise one-off government grants of a capital nature, transfers involving changes in the ownership, acquisition or disposal of fixed assets, legacies, debt forgiveness and other such items. South Africa generally runs a small positive balance on its capital transfer account.

1.3.2 The financial account

The **financial account** (previously referred to as the capital account) records exchanges of international asset claims. For example, if a US bank buys a bond issued by the South African government, a South African company purchases shares in a British company or a foreign company establishes a controlling interest in a local manufacturing concern, the value of these transactions will be reflected in the financial account of the countries concerned. Note that the financial account does not record the stocks of the assets and liabilities. It is the **changes** in foreign assets and liabilities that are shown in the balance of payments. The three main subdivisions of the financial account are

1. Direct investment,
2. Portfolio investment
3. Other investment.

Direct investment refers to foreign investments in South Africa (changes in foreign liabilities or inflows) and investments abroad by South African residents (changes in foreign assets or outflows) where the companies or other organisations concerned have a significant share of such investment. The share should be significant in that there should be an intention to have a say in the control or management of the investment, this is defined as at least a 10 per cent share of the voting rights in the investment undertaking concerned.
Net direct investment (changes in foreign liabilities plus the changes in foreign assets) was negative in 2004 and 2006, meaning that foreigners invested less in South Africa than we invested abroad over this period. However, the substantial net inflows of direct investment in 2008 indicate the generally positive view of South Africa as a destination for foreign direct investment.

Portfolio investment is the purchase and sale of financial claims such as bonds, treasury bills and equities. Unlike direct investments, there is no intention by the investor to exercise any control over portfolio investments. The justification for such investments is based purely on the expected financial gain or return on investment. Portfolio investments are notoriously fickle because changes in expected returns may trigger speculative buying or selling activity.

Other investment includes all financial transactions that are not part of direct or portfolio investment or changes in reserve assets. The main item here is **trade credit**. For example, when a South African importer purchases goods from a foreign supplier, he or she will usually be granted short-term credit (representing an increase in foreign liabilities). The local or foreign correspondent bank may arrange the credit. Similarly, a foreign purchaser of goods exported by a South African company will normally obtain such credit (an increase in foreign assets).

Direct foreign investment is generally considered to be a more desirable form of foreign investment than portfolio investment because it demonstrates a stronger commitment to invest over the longer term. It may thus have a more stable and enduring positive effect on the domestic economy than the speculative “hot money” flows. It is generally agreed that *speculative capital movements* may prove to be disruptive and difficult for the monetary authorities to counteract. Besides its (hopefully positive) effects on employment, direct foreign investment may also bring with it much needed transfers of *scarce skills, technology and innovations from abroad.* These considerations are especially significant for a small, open and developing economy such as that of South Africa.

Note in table 1.1 that a current account deficit is often associated with a surplus balance on the financial account, and vice versa (this is the case for each year recorded in table 1.1 except 2002 and 2003). This pattern is common in many developing countries, including South Africa. *Developing countries typically finance current account deficits through net capital inflows across the financial account.* Moreover, if imports exceed exports, this implies that South Africa is receiving more trade credit than it is granting to foreigners, which is reflected in an increase in net other investment. Also, interest rates tend to be higher when the current account is in deficit and lower when there is a surplus. For example, the drain of domestic money resulting from a current account deficit automatically creates tightness in the local money market and puts upward pressure on interest rates. This may be intensified by deliberate monetary policies to reduce domestic demand. The immediate effect of higher interest rates may be to attract increased capital inflows, thus leading to the observed correlation between the current and financial accounts of the balance of payments.

1.3.3 Unrecorded transactions

Unrecorded transactions arise from the use of a double-entry accounting system to reconcile the balance of payments. The net sum of debit and credit entries arising from balance of payments transactions should equal the change in the country's net gold and foreign exchange reserves. The difference between the recorded change in the net gold and foreign exchange reserves and the sum of the current, capital transfer and financial account balances is classified as unrecorded transactions. Thus, in practice, the value of unrecorded transactions serves as a residual that ensures that the balance of payments accounts always balance.

1.3.4 The official reserves

Changes in the stock of official gold and other foreign exchange reserves reflect the net inflow or outflow of foreign exchange, resulting from (non-central bank) balance of payments transactions over a certain period. Any transaction that leads to a **derived demand** for foreign currency can be thought of as a debit (-) item or outflow of foreign exchange. For example, imports of goods and services into South Africa create a demand for foreign currency (and thus a corresponding supply of rand) in the foreign exchange market. Exports of goods and services from South Africa, however, create a supply of foreign currency (demand for rand). Any transaction that leads to a supply of foreign currency in the foreign exchange market can thus be regarded as a credit (+) item or inflow of foreign exchange. Similarly, the purchase by a South African resident of foreign shares or bonds creates a derived demand for foreign currency, whereas the purchase by a nonresident of South African shares creates a supply of foreign currency (demand for rand) in the foreign exchange market.

Changes in the net gold and foreign exchange reserves are sometimes also referred to as **accommodating** or "*below-the-line*" foreign exchange flows, in contrast to **autonomous** *"above-the-line*" flows. Autonomous flows or payments simply mean balance of payments transactions not related to changes in the official reserves. Any imbalance in these payments is met or accommodated by the required change in the official reserves.

1.4 THE SIGNIFICANCE OF IMBALANCES IN THE BALANCE OF PAYMENTS

The **economic** significance of changes in the balance of payments must be clearly distinguished from the balance of payments as an **accounting** statement. A country's gold and foreign exchange reserves are not inexhaustible. Above-the-line deficits can only be accommodated temporarily by below-the-line reductions in official reserves or by access to foreign lines of credit. Long before the reserves are depleted, it will be necessary to adjust monetary, fiscal and possibly other economic policies to avert a full-blown balance of payments crisis (the appropriate remedial measures will depend to some extent on whether the country concerned has a fixed or floating exchange rate system).

Moreover, imbalances above the line may be significant even if they do not require any change in official reserves. For example, the foreign exchange outflows corresponding to a current account deficit may be more or less balanced by inflows corresponding to a financial account surplus, that is, nonresidents may be willing to finance such deficits for a time.

However, such borrowings must be serviced (by interest and dividend payments, etc) and eventually repaid. *The accumulation of foreign liabilities also cannot continue indefinitel*y – a point will be reached at which foreign lenders may no longer be willing to finance further deficits and may even withdraw existing capital. This will necessitate the tough monetary and other policies mentioned earlier. Thus capital inflows, particularly portfolio investments, can at best postpone the adjustments that must eventually take place.

Conversely, persistent large current account surpluses are not without their own problems. For example, China's systematic current account surpluses since the 1990s imply that its major trading partners, in particular the USA, have had to endure equally large current account deficits. Large economically powerful countries like the USA may not be content to sit by passively and allow such a situation to continue without attempting some kind of remedial action. Also, under a flexible exchange rate system, such large current account surpluses may well lead to a sharp appreciation of the currency, thereby reducing foreign demand for exports and increasing domestic demand for imports, at least in the short run.

This may lead to reduced aggregate demand, production and employment in the short run. Note that a current account deficit is not necessarily "bad", and a surplus necessarily "good". A current account deficit implies that a country is consuming more than it is producing. Imported goods add to consumer welfare, whereas exports represent a sacrifice in the sense of production of goods and services that are not available for domestic consumption. As noted above, *such deficits only become problematic over time if foreigners are unwilling to finance them.*

Finally, it should be noted that changes in the foreign exchange reserves reflect corresponding changes in the domestic money supply (defined here as notes, coins and demand deposits with the private nonbank sector). A decrease in the reserves implies that there has been a **net conversion of domestic currency** into foreign currency above-the-line and therefore a contraction in the domestic money supply, *ceteris paribus*. Conversely, an increase in the reserves implies that there has been a **net conversion of foreign currency** into domestic currency, and thus an expansion of the domestic money supply (which would be offset to the extent of any decrease in domestic credit that may have occurred over the same period).

STUDY UNIT 2 - FOREIGN EXCHANGE MARKETS AND EXCHANGE RATES

2.1 INTRODUCTION (14.1)

Foreign exchange markets are the markets in which individuals, firms and banks buy and sell foreign currencies or foreign exchange. Sales turnover in the foreign exchange markets generally far exceeds that of the equity and bond markets. Tt is the market in which the country's exchange rates are determined – which, directly or indirectly, affects decision making throughout the economy.
The different money centres are connected electronically and are in constant contact with one another, thus forming a single foreign exchange market.

2.2 FUNCTIONS OF THE FOREIGN EXCHANGE MARKETS (14.2)

The prescribed book identifies three main functions:

1. the transfer of purchasing power from one currency to another
2. the credit function
3. providing facilities for hedging and speculation

The transfer of purchasing power from one currency to another is by far the principle function and usually accomplished by electronic transfer. The demand for foreign currency arises when a tourists visits a country, when a domestic firm want to import from other nations, when an individual or firm wants to invest abroad, and vice versa when demand for domestic currency arises.
If a nation's total demand for foreign exchange for foreign transactions exceeds foreign exchange earnings, the rate at which the currencies exchange will have to change to equilibrate the total quantities demanded and supplied.
Four levels of transactions or participants can be identified in foreign exchange markets:

1. **Traditional users** such as tourist, importers, exporters, investors and so on.
2. **Commercial banks** which act as clearing houses between users and earners.
3. **Foreign exchange brokers** through whom the nation's commercial banks even out their foreign exchange inflows and outflows.
4. The nation's **central bank** which acts as the seller or buyer of last resort when the nation's total foreign exchange earnings and expenditures are unequal.

The credit function is performed when goods are used in transit and also to allow the buyer time to resell the goods and make payments. Exporters usually discount the importers obligation to pay at the foreign department of the bank. The exporter gets paid right away and the bank will collect payment from the importer when it is due.

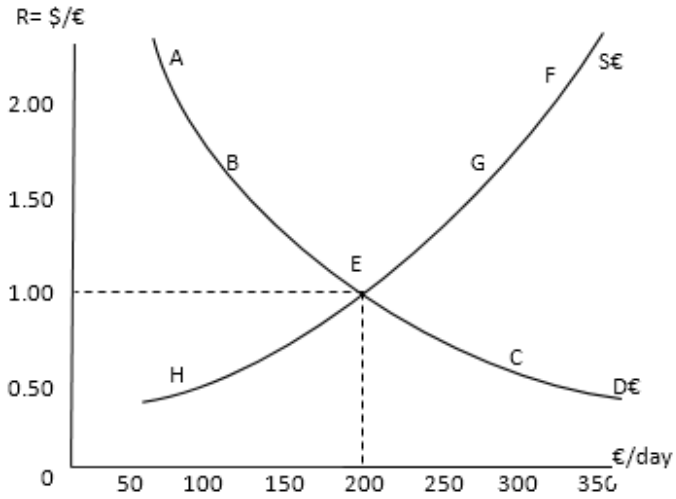
Hedging and speculation facilities need to be provided by the forex markets. About 90 percent of forex trading reflects purely financial transactions and only 10 percent is for trade financing.

2.3 FOREIGN EXCHANGE RATES (14.3)

2.3.1 Equilibrium foreign exchange rates

Exchanges of one currency for another are made in the foreign exchange markets. Foreign exchange market do not necessarily have a physical location. The existence of a foreign exchange market requires only that prospective buyers and sellers of foreign currencies (foreign exchange) can communicate their intentions. This is usually done via the banking system which acts as a financial intermediary.
The greater volume of foreign exchange transactions through the formal banking system is in the form of electronic bookkeeping transfers of funds, not physical exchanges of actual notes and coins. In some countries, particularly where the authorities try to maintain an overvalued official exchange rate, informal or "parallel" markets in notes and coins may exist.

Definition: An exchange rate is the domestic price of foreign currency.
The vertical axis measures the dollar price of the euro (R = $/€), and the horizontal axis measures the quantity of euros. Under a flexible exchange rate system, equilibrium (E) exchange rate is R=1, at which quantity supplied is equal to €200 million per day. At a rate lower than R=1, a shortage of euros would result and drive the price up back towards the equilibrium point over the long run, and vice versa.



The **exchange rate** (R) between the dollar and euro is equal to the number of dollars needed to purchase one euro.
If the US demand curve shifts up, as a result for increased taste of Euro goods, and the supply curve for euros at point G, the equilibrium rate would be R=1.50 and quantity would be €300 million per day. The dollar is said to have **depreciated.**

Depreciation is thus an increase in the domestic price of foreign currency. Conversely, an **appreciation** thus refers to a decline in the domestic price of the foreign currency.

Note that we could just as easily define the exchange rate the other way around, as the foreign price of domestic currency. If the rand/dollar (ZAR/USD) rate of exchange is 7,5000 (**a direct quotation**), this would be the same as saying that the dollar/rand (USD/ZAR) exchange rate is 0,1333 (**an indirect quotation**). It is common practice to quote exchange rates to four decimal places, because the magnitude of many transactions as even small changes in exchange rates can give rise to substantial absolute changes in the value of such transactions. Banks often quote some exchange rates both indirectly and directly.

This table indicates First National Bank's exchange rates in the order of selling, telegraphic transfer (**TT**) buying, airmail (**AM**) buying and surface mail (**SM**) buying. The rates refer to the previous day's afternoon fix and apply to amounts of R50 000 or less for dollars and R10 000 or less for other currencies.
The first three currencies refer to the rand per foreign currency unit (direct pricing). Subsequent currencies refer to the foreign currency unit per rand (indirect pricing)

These are **spot exchange rates** for immediate or on-the-spot delivery of foreign exchange (in practice, two working days). The bank quotes the exchange rates as indicative rates for its customers on a particular day. They are not the same as the rates quoted by the bank's foreign exchange dealers to other currency traders in the **interbank market**. Nor are you likely to be given exactly the same rate if you phone your bank to buy or sell foreign currency, because the rates change in response to market conditions throughout the day. Other commercial banks may quote slightly different rates and major clients may be quoted better rates than small customers.

CURRENCY	SELLING	TT	AM	SM
DOLLAR, USD	7,7094	7,4528	7,3968	7,4453
POUND, GBP	11,6342	11,1430	11,0946	11,1318
EURO, EUR	10,5598	10,1147	10,0849	10,1045
AUSTRALIA, AUD	0.1421	0,1498	0,1504	0,1499
BOTSWANA, BWP	0,8579	0,9462	0,9584	0,9472
CANADA, CAD	0,1323	0,1409	0,1416	0,1410
SWISS, CHF	0,1385	0,1448	0.1454	0,1450
DENMARK, DKK	0,7002	0,7405	0,7448	0,7412
HONG KONG, HKD	0,9896	1,0629	1,0709	1,0640
INDIA, INR	5,8734	6,2433	6,2433	6,2496
JAPAN, JPY	11,4686	11,9894	12,0135	12,0015
KENYA, KES	9,6355	10,6752	0,0000	10,6859
MAURITIUS, MUR	3,4957	0,0000	0,0000	0.0000
MALAWI, MWK	17,1609	0,0000	0,0000	0.0000
MOZAMBIQUE, MZM	3,6177	0,0000	0,0000	0.0000
NORWAY, NOK	0.7607	0,8016	0,8089	0,8024
NEW ZEALND, NZD	0,1836	0,1951	0,1959	0,1953
PAKISTAN, PKR	10,7160	11,5511	0,0000	11,5672
SWEDEN, SEK	0,9201	0,9697	0,9733	0,9707
SINGAPORE, SGD	0.1792	0,1909	0,1923	0,1911
UGANDA, UGS	251,6927	275,0912	0,0000	275,3684
ZAMBIA, ZMK	533,8937	0,0000	0,0000	0.0000

The exchange rates are quoted, the **selling price** is always at a higher domestic price than any of the buying prices for a particular currency. This difference is known as the **spread** and is the main way in which the banks make a profit from foreign exchange transactions.

The exchange rate becomes more expensive to the customer the less convenient and the longer the time to the transaction's settlement for the bank.

- The **TT or telegraphic transfer** buying rate is usually applied to large transfers of funds and is the best buying rate a customer can obtain because it is the most convenient way for the bank to convert and transfer the funds, with settlement within two working days.
- The **SM or surface mail** rate is the worst buying rate that applies to a customer wishing to exchange foreign currency notes (surplus notes have to be sent back to the country of origin by surface mail).
- The **AM or airmail** rate applies to foreign bank cheques and traveller's cheques, and falls between the other two rates. For large transactions, most banks will quote more favourable rates than the published exchange rates.

The dollar is quoted first because foreign exchange dealers use it as a common currency denominator. All foreign currency transactions first go through the US dollar. All currencies are quoted against the dollar first, and then converted to calculate exchange rates against the rand. These are known as **cross rates.**

Ignoring the difference between buying and selling prices for the moment, if the ZAR/USD exchange rate is 7,7094 and the USD/EUR exchange rate is 1,3697, then the implied ZAR/EUR exchange rate is 10,5595. The ZAR/EUR exchange rate is found by multiplying the ZAR/EUR rate by the USD/EUR rate (7,7094 x 1,3697 = 10,5596). The main reason why banks quote rates this way is to

1. avoid the complex task of giving hundreds of direct quotations for all the different currencies and
2. settlement in the local foreign exchange market is typically in rand.

- **Nominal exchange rate** - is defined as the number of units of the domestic currency that can purchase a unit of a given foreign currency. A decrease in this variable is termed nominal appreciation of the currency. (Under the fixed exchange rate regime, a downward adjustment of the rate E is termed revaluation.)
- **Real exchange rate**- tells how much the goods and services in the domestic country can be exchanged for the goods and services in a foreign country

The exchange rates quoted in the table are **nominal bilateral exchange rates**, that is, *the exchange rates between two national currencies in face value or money terms*. Sometimes it is useful to know how the domestic currency is faring against more than just one currency at a time. For this purpose, a **nominal effective exchange rate** can be calculated. This is simply a **weighted average of the bilateral exchange rates** that thus gives us a composite value for the domestic currency. Note that a simple arithmetic average is unsatisfactory because the importance of one foreign currency may be much greater than another. For example, the US dollar and the British pound have a much greater weighting against the South African rand than, say, the Botswana pula. The foreign country's share of the trade in the domestic country's total trade figures (e.g. imports from the foreign currency country as a percentage of our total imports from abroad) usually determines the weights.

Also note that it is first necessary to convert the different exchange rates to **index numbers** with a common base year before taking an average. This is to avoid the problem of different units of denomination. For example, simply averaging the ZAR/USD and the ZAR/JPY exchange rates does not give a true average measure of the value of the rand against these two currencies. This reflects the fact that, just because more rand are required to purchase dollars than yen at a particular time, it does not necessarily mean that the rand is weaker against the dollar than the yen. The index time series is commonly derived for monthly, quarterly or annual exchange rate data. Only comparisons of the index numbers over time reveal useful information about changes in the relative values of the currencies concerned.

Changes in **nominal exchange rates** give us some idea about how competitive a country's goods and services are in world markets. However, this is not the whole story. If, for example, an average 15 per cent depreciation in the rand against the dollar over the course of, say, a year corresponds with a 15 per cent increase in the level of domestic prices (inflation) then, in the absence of any change in the prices of US goods, the competitive edge provided by the depreciation has been fully eroded.

What if, during the same period, the dollar prices of US goods also rose by, say, 5 per cent? If we subtract US inflation from the inflation in South Africa we end up with an inflation differential of 10 per cent. This does not fully offset the 15 per cent depreciation in the rand against the dollar, so the net effect is that South African goods are 5 per cent cheaper for Americans. The **nominal exchange rate** adjusted by relative inflation rates is called the **real exchange rate**. For time series data, real exchange rates are calculated by dividing a foreign price index by the equivalent domestic price index and then multiplying by the relevant exchange rate. Thus the real exchange rate is usually also expressed as an index number. As with nominal exchange rates, it can be calculated as either a bilateral exchange rate against a single foreign currency or as a real effective exchange rate against a weighted basket of currencies. Note that different real exchange rates can be calculated depending on the choice of price or cost indexes (the most common indexes used to calculate real exchange rates being the consumer price index, the wholesale price index and the GDP deflator).

2.3.2 Arbitrage

Arbitrage refers to the purchase of a currency in the monetary centre where it is cheaper, for immediate resale in the monetary centre where it is more expensive, in order to make a profit. The larger the difference in the price (exchange rate) of the currency, the greater the potential profit will be. For such profits to be realised, the difference in currency prices must also be greater than the costs of arbitrage. Arbitrage transactions costs are reflected in the spread between bid and offer prices for the currencies concerned.

Example: Assume that the USD/GBP exchange rate is 1.9500 in the London foreign exchange market but only 1,9000 in the New York foreign exchange market. A bank or a large company with, say, GBP 10 000 000 starting capital can make arbitrage profits as follows:

Sell GBP to buy USD 19 500 000 (GBP 10 000 000 x 1.9500) in the London market.
Sell USD to buy GBP 10 263 158 (USD 19 500 000 ÷ 1.9000) in the New York market.
Profit is GBP 263 158 (GBP 10 263 158 – GBP 10 000 000).

Another way of stating the potential profit is to take the difference between the two

Note that with three currencies, any two exchange rates imply the third. For any two dollar exchange rates, the implied non-dollar exchange rate is called a cross rate, as explained above. In such cases, **three-point or triangular arbitrage** ensures that the exchange rates are consistent.

Example: Assume that the following exchange rates prevail in the local foreign exchange market:

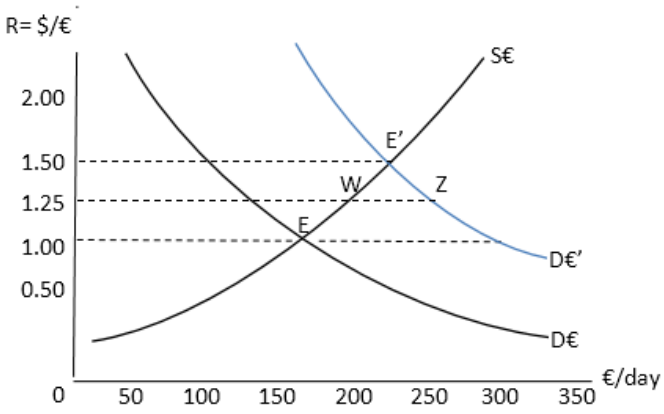
ZAR/USD 7.5000
USD/GBP 1.9000
ZAR/GBP 14.5000

In this case, the rand is undervalued against the pound since the other two exchange rates imply a ZAR/GBP cross exchange rate of 14,2500 (7,5000 X 1,9000). Assuming a starting capital of ZAR 10 000 000, arbitrage profits can be made as follows:

Sell ZAR to buy USD 1 333 333 (ZAR 10 000 000 ÷ 7.5000).
Sell USD to buy GBP 701 754 (USD 1 333 333 ÷ 1.9000).
Sell GBP to buy ZAR 10 175 433 (GBP 701 754 x 14.5000).
Profit is ZAR 175 433 (ZAR 10 175 433 – ZAR 10 000 000).

Transaction costs for the banks are typically insignificant and such transactions can be conducted almost instantaneously (by telephone or computer trading). This virtually eliminates the risk of adverse changes in the relevant exchange rates before the transaction is completed.
Arbitrage will ensure that the law of one price is upheld by pushing the price of the currency up where it is relatively cheap and down where it is more costly, until the prices (exchange rates) are equalised.

2.3.3 The Exchange Rate and the Balance of Payments



At point E, the E the exchange rate of R=$/€=1, at which the quantities of euros demanded and supplied are equal at €200 million per day. If D€ shifted up to D€' the United States could maintain the exchange rate as R=1 by satisfying (out of its official euro reserves) the excess demand of €250 million per day. With a freely flexible exchange rate system, the dollar would depreciate until R=1.50 at point'. If, on the other hand, the United States wanted to limit the depreciation of the dollar to R=1.25 under a managed float, it would have to satisfy the excess demand of €100 million per day (WZ) out of its official euro reserves.

The US **demand for euros** arises from the US demand for imports of goods and services from the European Union (a capital outflow from the US). The **supply of euros** arises from US exports of goods and services to the European monetary union (a capital inflow for the US). These are both autonomous debit (outflow) and credit (inflow) transaction of the united states of transfers to and from E.U and the US.

If the US operated under a **freely flexible exchange rate system**, the exchange rate would rise, i.e. the dollar would depreciate from R=1.00 to R=1.50 at point E', with a supply of €300 million per day. The US would not lose any reserves, and, international reserves would not be necessary under this system. The tendency for an excess demand for euros on autonomous transactions would be completely eliminated by a sufficient depreciation of the dollar with respect to the euro.

Under a **managed floating exchange rate system** of the type the US has been operating in since 1793 US monetary authorities can intervene in foreign exchange markets to moderate the depreciation or appreciation of the dollar.
At point D€ and S€ at equilibrium as E, the exchange rate of R=$/€=1, at which the quantities of euros demanded and supplied are equal at €200 million per day. If the US autonomous demand for euros, such as an increase in tastes for EMU products, shifts the D€ to D€'. If the US wanted to maintain the exchange rate fixed at R=$/€=1, US monetary authorities would have to satisfy the excess demand for euros of TE, €250 million per day, out of its official reserve holdings. Alternatively, EMU authorities would have to purchase dollars (thus adding to their reserves) and supply of euros to the foreign exchange market to prevent an appreciation of the euro, a depreciation of the dollar. In either case, the US official settlements balance would show a deficit of €250m per day or $91.25 billion per year at the exchange rate of R=$/€=1.
The US might limit the depreciation to R=1.25 instead of going to R=1.50. The US does this by supplying the to the foreign exchange market the excess demand for euros WZ, €100 million per day out of its reserves. Under this system, part of the potential deficit in the US balance of payments is covered by the measuring the loss of US international reserves or by the amount of net credit balance in the official reserves amount. Under a **managed float**, the loss of reserves only indicates the degree of official intervention of foreign exchange markets to influence the level and movement of exchange rates and not the balance-of-payments deficit.

The concept and measurement of international transactions and the balance-of-payments are very important and useful because:

1. The flow of trade provides the **link** between international transactions and the national income.
2. Many developing countries still operate under a **fixed exchange rate system** and peg their currency to a major currency, such as the US dollar or Euro.
3. The IMF requires all member nations to **report their balance-of-payments** statements annually to it.
4. While not measuring the deficit or surplus in the balance of payments, the balance of the official reserve account gives an indication of the **degree of intervention by the nations monetary authorities** in the foreign exchange market to reduce exchange rate volatility and to influence exchange rate levels.,

A fixed exchange rate system - A country's exchange rate regime under which the government or central bank ties the official exchange rate to another country's currency (or the price of gold). The purpose of a fixed exchange rate system is to maintain a country's currency value within a very narrow band. Also known as pegged exchange rate

Floating exchange rate system - A country's exchange rate regime where its currency is set by the foreign-exchange market through supply and demand for that particular currency relative to other currencies. Thus, floating exchange rates change freely and are determined by trading in the forex market. This is in contrast to a "fixed exchange rate" regime.

Managed Floating exchange rate system - A system of floating exchange rates in which the government or the country's central bank occasionally intervenes to change the direction of the value of the country's currency. In most instances, the intervention aspect of a dirty float system is meant to act as a buffer against an external economic shock before its effects become truly disruptive to the domestic economy.

2.4 SPOT AND FORWARD RATES, CURRENCY SWAPS, FUTURES AND OPTIONS

2.4.1 Spot and Forward Rates

The spot market - transactions in foreign exchange are for immediate delivery or settlement of the currency concerned. In practice, to allow time for the administration of transactions, this usually means two working days after the transaction has been concluded.
The forward foreign exchange market - the amount of foreign currency and the exchange rate are decided now, but the delivery of the currency is for a given date in the future. The forward exchange rate agreed to now is generally not the same as the ruling spot exchange rate. It may be higher or lower than the spot exchange rate, depending on the difference

2.4.2 Currency Swaps

A foreign exchange swap refers to a spot sale of a currency combined with a forward repurchase of the same currency – as part of a single transaction. Suppose a Citibank receives a $1 million payment that it will need in 3 months but want to invest this in euros in the meantime. Citibank incurs lower brokerage fees by swapping the $1 million into euros with a Deutsche Bank as part of a single transaction deal, this instead of selling dollars for euros in the spot market today and and the same time repurchasing dollars for euros in the forward market for delivery in 3 months time, in two separate transactions.
The **swap rate**, usually expressed on a yearly basis, is the difference between the spot and forward rates in the currency swap.

Currency swaps are useful because there are fewer transactions and therefore smaller transaction costs than entering into a series of separate spot and forward transactions. Note the importance of currency swaps in interbank currency trading.

2.4.3 Foreign Exchange Futures and Options

A foreign exchange futures is a forward contract for standardized currency amounts and selected calendar dates traded on an organized market or exchange.
In the **futures market**:

- only a few currencies are traded,(Japanese Yen, Canadian Dollar, British Pound, Swiss Franc, Australian Dollar, Mexican Peso, Euro) and are
- Subject to daily limits on exchange rate fluctuations; and trading takes place in a few geographical locations.
- International Money Market (IMM) trading are done as contract of standard size.
- Only four dates are available; the third Wednesday in March, June, September and December.
- Buyers and sellers pay a brokerage commission and are required to post a security deposit or margin.

Futures contracts are usually:

- For smaller amounts than forward contracts and this are more useful to small firms than to large ones but are more expensive.
- Futures contract can also be sold at any time up until maturity on an organized futures market, while forward contracts cannot.

A **foreign exchange options** is a:

- contract giving the purchaser the right, but not the obligation, to buy (a call option) or sell (a put option) a standard amount of a traded currency on a stated date (the European option) or at any time before a stated date (the American option) and at a stated price (the strike or exercise option).
- Are in standard sizes equal to those of futures IMM contracts.
- The buyer has the choice to purchase of forgo the purchase if it turns out to be unprofitable.
- The seller of the option must fulfill the contract if the byer so desires.
- The buyer pays the seller a premium (the option price) ranging from 1 – 5% of the contract's value for this privilege when he or she enters the contract.

Neither forward contract nor futures are options. Although forward contracts can be reversed and futures can be sold back ti the futures exchange, both must be exercised. Thus, options are less flexible than forward contracts but can be more useful, for example: an American firm making a bid to take over an EMU firm may be required to promise to pay a specified amount in Euros. Since the American firm does not know if its bid will be successful, it will purchase an option to buy the euros that it would need and will exercise the option if the bid is successful.

2.5 FOREIGN EXCHANGE RISKS, HEDGING AND SPECULATION (14.5)

2.5.A Foreign Exchange Risks

There are two broad categories of international risk:

1. **Country risk**
2. **Exchange rate risk**.

Some types of **country risk** are no different from certain domestic risks, for example, the credit risk that a foreign debtor may default on the due payment of interest or capital. However, some country risks arise purely because of the actions taken by a sovereign country that may adversely affect foreign investments or other interests. Expropriation or confiscation of foreign property, imposition of foreign exchange controls and adverse monetary or fiscal policies are common examples in this regard. Because different legal systems operate in some countries there is also the risk that contracts may be unenforceable or interpreted differently. Country risks are generally difficult either to assess or to hedge effectively. Once this is done, however, one can only avoid the assessed risk by deciding beforehand to avoid or reduce the desired transactions with the foreign parties concerned.

Exchange rate or currency risk is the market risk of an international transaction or investment due to changes in the relevant exchange rate. There are three types of exchange rate risk:

1. **Transaction risk**
2. **Economic risk**
3. **Translation risk.**

Transaction risk arises when an international transaction involves a time lag in the payment or in the receipt of a foreign currency. E.G, a South African exporter may extend three months' trade credit to a foreign buyer, if the goods are priced in rand, the foreign buyer bears the exchange rate risk (whereas if they had been priced in the foreign currency, the risk would have been borne by the South African exporter). If the rand appreciates by the end of this period, the foreign buyer or importer will have to pay more. Such contracts may be for the purchase or sale of foreign currency such as in a three-month FEC purchase contract for the rand value of the South African exports, the foreign importer applies to a bank for the purchase of rand (in exchange for the importer's domestic currency) in three months hence, but at a price (the forward exchange rate) agreed upon at the time of the contract. Thus no matter what happens to spot exchange rates over this period, the foreign importer knows exactly how much in home currency will have to be paid on the due date.

Economic risk is the risk that changes in exchange rates will affect the company's competitiveness and future profitability. If, for example, the rand appreciates and remains at its stronger levels, then the South African exporter's competitive position is eroded such that future sales and profits may decline. It is more difficult to cover or hedge this risk using FECs because such contracts rarely extend beyond one year. However, companies can counter the decline in profitability by cutting domestic production costs or by otherwise restructuring the production process to reduce costs.

Translation risk is present whenever there is a mismatch between a company's foreign currency assets and liabilities. The effects of exchange rate changes will become apparent when the company prepares its balance sheet statement for its annual report. For example, if a multinational company reporting in the UK has more dollar assets than liabilities – this is called a **pen dollar position** – then an appreciation of the pound against the dollar will diminish the pound value of its dollar assets more than its liabilities. Depending on the accounting standards or practices of the company, this "loss" may have to be written down, thus reducing bottom-line profits for the reporting period concerned (conversely for a depreciation of the pound against the dollar). The total **exposure** of the company to exchange risk is the sum of its open positions in different currencies. It may be difficult, if not impossible, for some companies to eliminate translation risk entirely. This risk may be reduced if one tries to ensure a better match between foreign currency assets and liabilities. A popular option is the **borrow-deposit** method, whereby companies try to finance the purchase of foreign currency assets by borrowing or otherwise raising capital in the same currencies.

2.5.2 Hedging

Hedging refers to the avoidance of a foreign exchange risk, or the covering of an open position. The basic reason for a forward foreign exchange market is that it allows importers and exporters to **hedge the risk of changes** in exchange rates that may affect their domestic currency payments and receipts respectively (despite the fact that the forward exchange market may also be used to speculate in foreign currencies).

Example: A South African importer orders a consignment of television sets from Japan. Payment is on delivery of the consignment in three months' time. The importer knows how much must be paid in Japanese yen, but not in rand because he does not know what the JPY/ZAR exchange rate will be in three months' time. To cover the risk of an unfavourable change in the exchange rate, the importer applies at his bank to buy the required amount of Japanese yen in three months' time at the ruling three-month forward JPY/ZAR exchange rate. The importer is then committed to a forward exchange contract (FEC) on the agreed terms.
Suppose the yen cost of the consignment is JPY 500 000 000 and the three-month forward JPY/ZAR exchange rate is 16.5000). To hedge against an unfavourable change in the spot JPY/ZAR exchange rate, the following transactions take place:

- Today: The South African importer buys a three-month FEC to buy JPY 500 000 000 for ZAR 30 303 030 (JPY 500 000 000 ÷ JPY/ZAR 16.5000 = ZAR 30 303 030).
- After three months: The South African importer's bank credits the Japanese exporter's bank with JPY 500 000 000.The South African importer's bank debits his account with ZAR 30 303 030.

Note that no money changes hand on the day the FEC is signed and the rand amount of the consignment is fixed at ZAR 30 303 030, no matter what the spot JPY/ZAR exchange rate happens to be on that date.

The same principle applies to South African exporters with goods denominated in foreign currency wishing to ensure their revenues in rand. In South Africa, this includes mining companies whose metals' and minerals' dollar export prices are determined in world markets. In this case, the exporter would buy a forward exchange contract to sell dollars in exchange for rand at some future date. The ability of traders and investors to hedge greatly facilitates the international flow of trade and investments. Without hedging there would be smaller international capital flow, less trade and specialization in production and smaller benefits from trade.

The most common or standard forward exchange contracts are for one-, three-, six- and 12-month periods, although FECs can often be tailor-made for a particular client (usually at a slightly higher cost than for the standard contracts). Also note that the forward exchange rates quoted on the different contracts vary and are not the same for each period.

The differences between the spot and forward exchange rates are mainly because of the influence of **differences in interest rates on the currencies** concerned. A forward exchange contract commits the holder to the terms of the contract. The contract is not allowed simply to lapse, although the holder may cancel it by taking out a reverse contract for the same maturity date.
If the rand had depreciated strongly against the Japanese yen by the end of the three-month forward exchange contract, the South African importer would have benefited from the contract. The importer would have avoided the increase in the rand cost of the consignment resulting from the depreciation in the rand.
If the rand had appreciated against the yen, the importer would have been better off without the contract. Hedging against the risk of changes in the exchange rate thus cuts both ways: one eliminates the chance of both gains and losses arising respectively from favourable and unfavourable changes in the value of the currency. The reason for hedging, however, is not to speculate on expected changes in exchange rates but to provide some **certainty about future payments and receipts** in local currency terms, allowing importers and exporters to plan ahead and budget accordingly.

2.5.3 Speculation

Speculation is the opposite of hedging.Whereas a hedger seeks to cover a foreign exchange risk, a speculatoir accepts and seeks out a foreign exchange risk, or an open position, in the hope of making a profit. **It is the attempt to profit from changes in exchange rates**. Such speculation, unlike arbitrage, is based on **expected** changes in exchange rates over time and thus necessarily involves uncertainty and risk. The speculator deliberately assumes an **open position** in particular currencies and is thus exposed to the **risk** of adverse changes in the exchange rate. Although substantial profits stand to be made if the speculator has guessed exchange rate movements correctly, massive losses will occur if exchange rates do not move as anticipated.
Example: Assume that the current spot ZAR/USD exchange rate is 7.5000. A speculator with access to, say, R10 million capital expects the rand to depreciate substantially against the dollar over the next three months. Let's assume that the speculator guesses correctly and that the rand depreciates against the dollar to ZAR 8.0000 in three months' time. In this case, the speculator will have been able to make a profit as follows:

- Sell ZAR to buy USD 1 333 333 (ZAR 10 000 000 ÷ 7.5000).

After three months:

- Sell USD to buy ZAR 10 666 664 (USD 1 333 333 x 8.0000).
- Profit is ZAR 666 664 (ZAR 10 666 664 – ZAR 10 000 000).
- The speculator makes ZAR 0.5000 for every dollar sold back to the market (ZAR 8.0000 – ZAR 7.5000).

Had such expectations proved incorrect and the dollar had depreciated against the rand, the speculator would have made a loss instead of a profit.

Speculators often prefer the forward market to the spot market, since no money usually has to be paid up front. Hence the speculator can achieve a highly leveraged position. However, most banks impose a limit on purely speculative forward exchange contracts and may insist on a deposit and margin payments by some of their customers.

Long position is when a speculator buys foreign currency on the spot, forward or futures market, or buys an option to purchase foreign currency with the expectation of reselling at a higher future spot rate.
Short position is when a speculator borrows or sells forward a foreign currency in the expectation of buying it at a future lower price to repay the foreign exchange loan or honour the forward sales contract or option.
Stabilizing speculation is the *purchase* of a foreign currency when the price of the foreign currency falls or is low, in the expectation that it will soon rise, thus leading to a profit. Or it is the sale of foreign currency when the exchange rate rises or is high in the expectation that it will soon fall.
Destabilizing speculation is the *sale* of foreign currency when the exchange rate falls or is low, in the expectation that it will fall even lower in the future, or the purchase of a foreign currency when the exchange rate is rising or is high in the expectation that it will rise even higher.

In South Africa, exchange control regulations limit the speculative open positions in foreign currencies that may be taken by banks. Exchange controls also prohibit individuals and companies without a foreign exchange licence from speculating in either the spot or forward exchange market. Every application to buy or sell foreign exchange must be supported by an underlying physical commercial or financial transaction. This does not mean, however, that it is impossible for individuals and companies in South Africa to speculate on changes in exchange rates. A decision not to hedge foreign currency payments or receipts in the forward exchange market is itself a speculative decision. Moreover, importers and exporters can hasten or delay payments for and receipts of foreign currency respectively, depending on their expectations of changes in exchange rates. In South Africa, this has periodically resulted in **leads and lags** pressure on the foreign exchange market. For example, a delay in the repatriation of foreign exchange proceeds by exporters (up to the maximum 180 days presently allowed by the exchange control regulations) can lead to a scarcity of dollars in the foreign exchange market and depreciation of the rand. This should only be temporary since the leads and lags eventually unwind and the hoarded dollars flow back into the market. However, it can add significantly to **volatility** in the exchange rate, especially if foreign speculators follow the trend and increase the pressure on the rand accordingly.

2.6 INTEREST ARBITRAGE AND THE EFFICIENCY OF FOREIGN EXCHANGE MARKETS (14.6)

Interest arbitrage refers to the international flow of short-term liquid capital to earn higher returns abroad. Interest arbitrage can be covered and uncovered.

2.6.1 Uncovered Interest Arbitrage

Related to uncovered interest arbitrage is the carry trade. Carry trade refers to the strategy in which an investor borrows low-yielding currencies and lends (invests in) high-yielding currencies. That is, an investor borrows a currency with a relatively low interest rate and uses the funds to purchase another currency yielding a higher interest rate. If the high-yielding currency depreciates during the investment period, the investor runs the risk of losing money.

2.6.1 Covered Interest Arbitrage

Covered interest arbitrage refers to the **spot purchase** of the foreign currency to make the investment and the offsetting simultaneous **forward sale** of the foreign currency to cover the **foreign exchange risk**. The investor exchanges the domestic for the foreign currency at the current spot rate in order to purchase foreign treasury bills, and at the same time the investor sells forward the amount of the foreign currency they will earn o as o coincide with the maturity of the foreign investment.

Arbitrage profits can be made from differences between domestic and foreign interest rates where the foreign investment is hedged or **covered** by a forward exchange contract. Arbitrageurs seeking the highest available returns internationally would first compare domestic and foreign interest rates. Borrowing money in low interest-yielding currencies to invest in higher interest-yielding currencies is known as the **carry trade**.
The **total return** on a foreign investment also depends on future changes in the exchange rate. For example, if money market interest rates in South Africa are 10 percentage points higher than those in the USA, but the rand depreciated by 15 per cent over the same investment period, then the total return on the rand investment would be minus 5 per cent. Arbitrageurs would have suffered a loss. However, arbitrageurs can avoid the risk of unfavourable changes in exchange rates by buying a forward exchange contract.
Hedging carry trade investments in this way is known as **covered interest arbitrage (CIA)**. Thus whether or not arbitrage to take advantage of the higher interest rate on rand is profitable will now also depend on the difference between the spot and forward exchange rates.
The total return on the investment depends on both the **interest rate differential** (which is known) and the **exchange rate** (which is uncertain) when the proceeds in rand are converted back into dollars. However, an arbitrageur can **cover the risk** of an adverse change in the exchange rate by buying an FEC to sell the rand forward against the dollar. Now arbitrage profits depend on the difference between the spot and forward exchange rate of the ZAR/USD compared to the interest rate differential.

2.6.3 Covered interest arbitrage parity

The **equilibrium** relationship between the relevant interest rates and the spot and forward exchange rates is called the **covered interest parity (CIP)** condition. In this instance their values are such that no opportunities for interest arbitrage profits exist. In other words, the equilibrium return on the uncovered asset equals the total return on the covered asset.
In equilibrium (i.e. when no arbitrage opportunities exist) the **forward premium or discount** to the spot exchange rate equals the interest rate differential between the two currencies concerned.

In South Africa, exchange controls allow only authorised dealer banks to engage in such arbitrage activities. However, competitive market pressure makes such opportunities scarce, as pointed out above. Moreover, the banks derive their forward exchange rates from prevailing interest rate differences on the currencies concerned. Thus, unless a bank's foreign exchange dealers make a mistake in calculating a forward exchange rate (which is extremely unlikely because most of these calculations are done automatically by computers), potential arbitrage profits are virtually zero. However, small deviations from CIP may arise because of the presence of transaction costs and possible risks in the form of the possible imposition (or removal) of exchange controls, potential default on government debt instruments and the like.

STUDY UNIT 3 – EXCHANGE RATE DETERMINATION

3.1 INTRODUCTION (15.1)

A flexible exchange rate is determined by supply and demand conditions in the foreign exchange market. WE examine more closely the fundamental economic forces that may influence these supply and demand conditions and thus the exchange rate. The emphasis is on changes in exchange rates rather than how the level of exchange rates is determined. The main variables studied in this regard are as follows:

- **Changes in relative price levels (the purchasing power parity theory),**
- **Changes in relative money supply and demand (the monetary approach)**
- **The portfolio balance model.**

The explanations of what determines a freely floating exchange rate are symmetrical to explanations of what determines the balance of payments under fixed exchange rates. For example, the monetary approach can be used to explain either the determination of flexible exchange rates or changes in the balance of payments under a fixed exchange rate.
The exchange rates of the world's major currencies such as the US dollar, the euro, the British pound and the Japanese yen are essentially market determined and thus more flexible than fixed, even though the authorities may intervene in the markets from time to time. The South African rand is also largely market determined (although within the ambit of the remaining exchange controls), with limited intervention by the Reserve Bank in the foreign exchange market to manage the exchange rate.

3.2 PURCHASING POWER PARITY THEORY (15.2)

The purchasing power parity (PPP) theory is often used as an explanation of **exchange rates in the long run**. The theory was first explicitly formulated in 1916 by the Swedish economist, Gustav Cassel. The basic idea is that there should be a connection between domestic and foreign price levels and the exchange rate for any two countries over the long run.

3.2.1 Absolute Purchasing Power Parity Theory

Absolute purchasing-power parity theory postulates that the equilibrium **exchange rate between two currencies is equal to the ratio of the price level in the two nations**: Specifically:

$$R = \frac{P}{P*}$$

- **R** – is the exchange rate or spot rate
- **P and P*** are the general price level in the home nation and in the foreign nation.

E.g. If the price of one bushel of wheat is $1 in the US and €1 in the EU, then the exchange rate is R=1. That is according to the law of one price, a given commodity should have the same price in both countries when expressed in terms of the same currency. If one bushel in the US was $0.50 in the US and $1.50 in the EU, firms would purchase wheat in the US and sell in the EU for a profit. This commodity arbitrage would cause the price of wheat to fall in the EU until the prices were equal, this is in the *absence of obstructions in the free flow of trade or subsidies and abstracting from transportation costs*.
This version of the PPP theory can be misleading, this is because:

- It appears to give the exchange rate that equilibrates trade in goods and services while completely disregarding the capital account. Thus, a nation experiencing capital outflows would have a deficit in its balance of payments, while a nation receiving capital inflows would have a surplus if the exchange rate were one that equilibrated trade in goods and services.
- This version of PPP will not give the exchange rate that equilibrates trade in goods and services because of the existence of many non-traded goods and services.

Since the general price level in each nation include both traded and non-traded commodities, and prices of the latter are not equalized by international trade, the absolute PPP theory will not lead to the exchange rate that equilibrates trade. The absolute PPP theory also fails to take into account transportations costs or other obstructions to the free flow of international trade. It can thus not be taken seriously and is usually used in its relative formulation.

3.2.2 Relative Purchasing Power Parity Theory

The more refined relative purchasing power parity theory postulates that the change in the exchange rate over a period of time should be proportional to the relative change in the price levels in the two nations over the same period. The relative PPP theory postulates that.

Specifically:

$$R_1 = \frac{P_1/P_0}{P*_1/P*_0} \cdot R_0$$

- $\boldsymbol{R_1}$ is the exchange rate in period 1.
- $\boldsymbol{R_0}$ is the exchange rate in the base period.

E.g. if the general price level does not change in the foreign nation from the base period 1 (i.e. $P*_1/P*_0 = 1$), while the general price level in the home nation increases by 50 percent, the relative price theory postulate that the exchange rate should be 50 percent higher in period 1 as compared with the base period.

The reasoning behind relative PPP is simple – if the prices of domestic goods increase at a faster rate than the prices of an equivalent basket of foreign goods, then one would expect a shift in demand away from domestic goods in favour of the now relatively cheaper foreign goods. Changes in exports and imports between the countries concerned lead to corresponding changes in the supply of and demand for the domestic currency, such that it will depreciate against the foreign currency.

For example, an increase in the inflation rate in the USA relative to the inflation rate in the euro zone would make US goods and services less competitive relative to those produced in the euro zone. On average, the euro zone would be able to export more to the USA than before, thereby increasing its supply of dollars. Also, the euro zone would tend to import less from the USA, thereby reducing its demand for dollars. The net effect is for the trade balance of the euro zone with the USA to increase, and for the euro to appreciate against the dollar (which is the same as saying that the dollar will depreciate against the euro).

Difficulties with the relative PPP:

- If absolute PPP is held, the relative PPP would also hold, but when relative PPP holds, the absolute PPP need not hold. For example, while the very existence of capital flows, transportation costs, other obstructions to the free flow of international trade, and government intervention policies leads to the rejection of absolute PPP, only a change in these would lead the relative PPP theories astray.
- The Balassa—Samuelson effect results from labour productivity in traded goods being higher in developed countries than in developing nations. This results from labour productivity in traded goods being higher in developed than in developing nations, but about the same in many non-traded goods and services sectors (e.g. haircutting). To remain in non-traded good sectors in developed nations, the price will be systematically higher than that in developing countries.

Since the general price index includes both traded and non-traded goods and services, and prices of the latter are not equalized by international trade but are relatively higher in developed nations, the relative PPP theory will tend to predict overvalued exchange rates for developing nations, with distortions being larger the greater the differences in the levels of development.

3.2.3 Empirical Tests of the Purchasing Power Parity Theory

The evidence from empirical tests of PPP does not support the theory as a **short run** relationship. Many other factors can influence the exchange rate in the short run, besides changes in the trade account of the balance of payments such as changes in relative interest rates and speculative capital movements unrelated to trade flow. Thus nominal exchange rates are frequently observed to overshoot their PPP determined values. However, there is some evidence to suggest that PPP does hold as a **long-run** relationship in the sense that divergent exchange rates appear to gravitate back towards PPP over time.

Although not stated explicitly in the textbook, PPP can also be viewed as a long-run equilibrium constraint rather than as a causal relationship. Accordingly, changes in exchange rates and inflation rates may show a statistically significant degree of correlation over the long run, but are not necessarily causally related. This would be the case if, for example, changes in other independent variables led both exchange rates and inflation rates to move in the same direction.

Despite all the globalization, international commodity markets are still much less integrated than national commodity markets. This is due to the existence of transportation costs, actual or threatened trade protection, information costs and very limited international labour mobility. As a consequence of various adjustment costs, exchange rates can move a great deal without triggering any immediate and large response in relative domestic prices.

We can make the following overall conclusion with regard to the empirical relevance of the PPP theory:

1. We expect the PPP to work well for highly traded individual commodities but less well for all traded goods together, and not so well for all goods.
2. For any level of aggregation, the PPP theory works reasonably well over very long periods of time (many decades) but not so well over one or two decades and not very well in the short run.
3. PPP works well in cases of purely monetary disturbances and in very inflationary periods but not so well in periods of monetary stability, and not well in situations of major change.

3.3 MONETARY APPROACH TO THE BALANCE OF PAYMENTS AND EXCHANGE RATES (15.3)

The monetary approach is closely linked to the purchasing power parity theory of exchange rates. The revival of monetarist thinking in the late 1960s and early 1970s took Cassel's interpretation of PPP a step further by explaining the determination of price levels in terms of excess supplies of domestic monies (i.e. money supply growth in excess of the demand for money). The monetary approach represents an extension of domestic monetarism to the international economy in that it views the balance of payments as an essentially monetary phenomenon.

3.3.1 Monetary Approach Under Fixed Exchange Rates

Under fixed exchange rates, a country cannot control its money supply, and disequilibrium in the domestic money market is regarded as the underlying cause of balance of payments disequilibrium (deficits or surpluses). For example, excess growth in the domestic money supply (i.e. greater than the growth in the domestic demand for money) results in a balance of payments deficit if the exchange rate is fixed.

The monetary approach begins by postulating that the demand for nominal money balances is positively related to the level of nominal national income and is stable in the long run.

The **demand for money** equation is:

Where M_d= quantity demanded of nominal money

$$\boldsymbol{M_d = kPY}$$

K = desired ratio of nominal money balances to nominal national income

P = domestic price level

Y = real output

PY is the nominal national income or output (GDP), this is assumed to be at or tend towards full employment. K is the desired ratio of nominal money balances to nominal national income. *K* is also equal to 1/*V*, where *V* is the circulation of money or the number of times a dollar turns over in the economy during a year. $M_d$is stable and positive function of the domestic price level and national income.

The **supply of money** equation is:

Where M_s= the nation's total money supply

$$\boldsymbol{M_s = m(D + F)}$$

m = money multiplier

D = domestic component of the nation's monetary base

F = international or foreign component of the nation's monetary base.

The domestic component of the nation's monetary base (D) is the domestic credit created by monetary authorities or the domestic assets backing the nation's money supply. F refers to the international reserves of the nation which can be increased or decreased through balance of payments surpluses or deficits. D + F is called the monetary base of the nation, or high-powered money. Under a fractional-reserve banking system, each new dollar of D and F deposited results in an increase in the nation's money supply by a multiple of 1. This is the money multiplier.

The multiplier is obtained by dividing the original deposit of $1 by the legal reserve requirement (LRR) of, for e.g. 20% or 0.2. That is $1/0.2 = 5. Due to excess reserves and leakages the real-world multiplier will likely be smaller. We assume for simplicity that the money multiplier is constant over time.

From a position of equilibrium where $\boldsymbol{M_d = M_s}$, an increase in the demand for money can be satisfied either by an increase in the nations domestic monetary base (D) or by an inflow if international reserves, or balance of payments surplus (F). If the nation's authorities do not increase the money base (D), the excess demand will be satisfied by an increase in F. If the nation's monetary authorities do not increase D, the excess demand will be satisfied by an increase in F.
An increase in the domestic component of a nation's monetary base and money supply, in the face of unchanged money demand, flows out the nation and leads to a fall in F, a deficit in the balance of payments.
Thus a surplus in the nations balance of payments results from an excess in the stock of money demanded that is not satisfied by an increase in the domestic component of the monetary base, while a deficit in the nations balance of payments results from an excess in the stock of the money supply of the nation that is not eliminated but the nations monetary authorities but is corrected by an outflow of reserves.

A nations therefore has no control over its money supply under a fixed exchange rate system in the long run, i.e. the size of the nation's money supply will be one that is consistent with equilibrium in its balance of payments in the long run. Only a reserve-currency system retains control over its money supply in the long run under a fixed exchange rate system because foreigners willingly hold dollars.

To summarize, a surplus in the nations balance of payments results from an excess in the stock of money demanded that is not satisfied by domestic monetary authorities. On the other hand, a deficit in the nations balance of payments results from an excess in the stock of money supplied hat is not eliminated of corrected by the nation's monetary authorities.
The nation balance of payments surplus of deficit is temporary and self-correcting in the long-run, i.e. after excess demand for or supply of money is corrected and the international flow of money dries up and comes to an end. Thus, except for a currency-reserve country, the nation has no control over its money supply in the long run under a fixed exchange rate system.

3.3.2 Monetary Approach Under Flexible Exchange Rates

Under a flexible exchange rate system, balance-of-payments *disequilibrium are immediately corrected by automatic changes in exchange rates without any international flow of money or reserves.* Thus, under a flexible exchange rate system, the nation retains dominant control over its money supply and monetary policy. Adjustment takes place as a result of the **change in domestic prices that accompanies the change in the exchange rate**.

- A **deficit in the balance of payments** (resulting from an excess money supply) leads to an a**utomatic depreciation of the nation's currency**, which causes prices and therefore the demand for money to rise sufficiently to absorb the excess supply of money and automatically eliminate the balance-of-payments deficit.
- A **surplus in the balance of payments** (resulting from an excess demand for money) automatically leads to an **appreciation of the nation's currency,** which tends to reduce domestic prices, thus eliminating the excess demand for money and the balance-of-payments surplus.

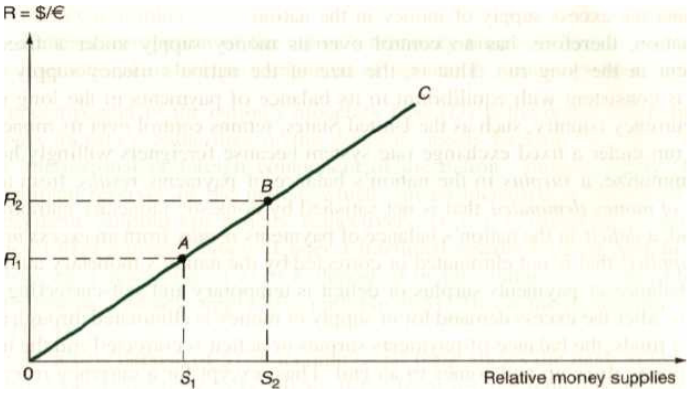
Whereas under fixed exchange rates, a balance-of-payments disequilibrium is defined as and results from an international flow of money or reserves (so that the nation has no control over its money supply in the long run), *under a flexible exchange rate system, a balance-of-payments disequilibrium is immediately corrected by an automatic change in exchange rates and without any international flow of money or reserves (so that the nation retains dominant control over its money supply and domestic monetary policy).*

The actual exchange value of a nation's currency in terms of the currencies of other nations is determined by

1. the **rate of growth of the money supply** and
2. **Real income in the nation relative to the growth of the money supply and real income in the other nations**.

For example, assuming zero growth in real income and the demand for money, as well as in the supply of money, in the rest of the world, the growth in the nation's money supply in excess of the growth in its real income and demand for money leads to an *increase in prices and in the exchange rate* (a depreciation of the currency) of the nation. Conversely, an increase in the nation's money supply that falls short of the increase in its real income and demand for money tends to *reduce prices and the exchange rate* (an appreciation of the currency) of the nation.

According to the monetary approach, a **currency depreciation** results from excessive money growth in the nation over time, while a **currency appreciation** results from inadequate money growth in the nation.
Put differently, a nation facing greater inflationary pressure than other nations (resulting from more rapid growth of its money supply in relation to the growth in its real income and demand for money) will find its exchange rate rising and currency depreciating. On the other hand, a nation facing lower inflationary pressure than the rest of the world will find its exchange rate falling and its currency appreciating.



Line OC shows the relationship between the money supply in the United States relative to the money supply in the European Monetary Union (EMU) [S = M_s(U.S.)/M_s(EMU)] and the dollar-euro exchange rate (R = $/€) Line OC thus shows that a change from S, to S_2.causes a proportional charge in R from R, to R_2.

With flexible exchange rates, the rest of the world is to some extent shielded from the monetary excesses of some nations. The nations with excessive money growth and depreciating currencies will now transmit inflationary pressures to the rest of the world primarily through their increased imports rather than directly through the export of money or reserves.

Under a managed floating exchange rate system of the type in operation today, the nation's monetary authorities intervene in foreign exchange markets and **either lose or accumulate international** reserves to prevent an "excessive" depreciation or appreciation of the nation's currency, respectively. Under such a system, part of a balance-of-payments deficit is automatically corrected by a depreciation of the nation's currency, and part is corrected by a loss of international.
As a result, the nation's money supply is affected by the balance-of-payments deficit, and domestic monetary policy loses some of its effectiveness. Under a managed float, the nation's money supply is similarly affected by excessive or inadequate growth of the money supply in other nations, although to a smaller extent than under a fixed exchange rate system.

3.3.3 Monetary Approach To Exchange Rate Determination

A county's exchange rate reflects the quantity of domestic money relative to foreign money.
Some monetary models assume that PPP always holds, even in the short run. These are examples of the **flexible-price** monetary model. This model implies that a country with a higher excess money supply growth rate relative to that of its main trading partners would tend to experience a higher inflation rate, and thus, via the classical PPP relationship, depreciation of the domestic currency against the foreign currencies concerned.

Since changes in price levels and trade flows take place relatively slowly in the long run, the flexible-price monetary model has difficulty explaining the observed **volatility** of exchange rates in the **short run**. For example, inflation differentials between countries with moderate inflation rates rarely change by more than a per cent or two a month, whereas exchange rates between the currencies concerned may at times adjust by more than five or even 10 per cent over the same period. If the flexible-price monetary model were correct, *observed changes in exchange rates would be of a similar order of magnitude to changes in relative price levels.*

The **sticky-price monetary model** goes some way to address these concerns. Sticky-price monetary models assume that goods prices adjust more slowly than asset market variables and that PPP only holds in the **long run**. In the **short run,** speculative international capital movements determine the exchange rate. Sticky-price monetary models allow a *dynamic analysis of exchange rate adjustments from short- to long-run equilibrium in response to a monetary shock.*

Such an analysis also helps to explain the frequently observed phenomenon of **overshooting.** Overshooting occurs in these models because of the assumption that *PPP does not hold in the short run*. For example, in response to an increase in the domestic money supply, the full initial burden of adjustment falls on the domestic interest rate to clear the money market. The lower interest rate leads to a sharp initial depreciation in the value of the domestic currency. Over time, however, depending on how slowly goods prices adjust, the domestic price level increases, which implies a decrease in the real money supply. The interest rate consequently **rises,** and the domestic currency now **appreciates** back towards its long-run equilibrium PPP value.

Previously, we defined the exchange rate as the domestic currency price of a unit of the foreign currency. With the dollar ($) as the domestic currency and the euro (€) as the foreign currency, the exchange rate (R) was defined as the number of dollars per euro, or R = $/€. For example, if R = $ I/€ 1, this means that one dollar is required to purchase one euro, or if R = $1.20/€l. it would take $1.20 to get one euro.
If markets are competitive and if there are no tariffs, transportation costs, or other obstructions to international trade, then according to the law of one price postulated by the purchasing-power parity (PPP) theory, the price of a commodity must be the same in the United States as in the European Monetary Union (EMU). The same is true for every other traded commodity and for all commodities together (price indices). That is;

- ***R*** is the exchange rate of the dollar
- ***P*** is the index of dollar prices in the United States
- ***P**** is the index of euro prices in the EMU

$$P = RP^* \text{ and } R = \frac{P}{P^*}$$

We can show how the exchange rate between the dollar and the euro is determined according to the monetary approach by starting with the nominal demand-for-money function of the United States (M_d) and for the EMU (M^*_d)

- **k** is the desired ratio of nominal money balances to nominal national income in the United States
- ***P*** is the price level in the United States
- ***Y*** is real output in the United States, while the asterisked symbols have the same meaning for the EMU.

$$M_d = kPY \text{ and } M^*_d = k^*P^*Y$$

$$R = \frac{Ms\ k^*Y^*}{M^*s\ kY}$$

Since *k** and *Y** in the EMU and *k* and *Y* in the United States are assumed to be constant, *R* is constant as long as *Ms* and *M*s* remain unchanged. In addition, changes in *R* are proportional to changes in *M* and inversely proportional to changes in *M*s*.

Several important things need to be noted with respect to the above equation.

1. It **depends on the purchasing-power parity** (PPP) theory and the law of one price.
2. The equation was derived from the **demand for nominal money balances** which does not include the interest rate. The relationship between interest rates and the exchange rate deals with expectations.
3. The exchange rate adjusts to **clear money markets** in each country without any flow or change in reserves. Thus, for a small country the PPP theory determines the price level under fixed exchange rates and the exchange rate under flexible rates.

3.3.4 Expectations, Interest Differentials and Exchange Rates

Market participants generally do not wait for events and changes in variables before deciding to buy, hold or sell currencies. The foreign exchange market is characterised by speculative behavior. Speculators try to anticipate changes in the variables thought to influence exchange rates and to buy and sell the currencies concerned accordingly. This is why sudden changes in exchange rates are often observed upon the release of any new information believed to be relevant to the market. For example, news that import tariffs are to be slashed, exchange controls scrapped or monetary policy eased, may lead speculators to sell (or buy) the currency concerned even before the events actually take place. Hence the mere announcement of such changes could cause the domestic currency to depreciate.

However, there is no invariable link between news releases, changes in expectations and exchange rates. For example, news that monetary policy is to be eased will not necessarily cause the domestic currency to depreciate. This will depend on the complex interplay of all the other forces affecting the exchange rate at a particular time. A case in point was the US Federal Reserve Bank's announcement that interest rates would be lowered to counteract an imminent recession early in 2001. The dollar tended to appreciate rather than depreciate on the view that the cut in interest rates would be good for growth and investment in the USA, thereby increasing the demand for dollars. Political and psychological factors may also influence expectations and affect exchange rates.

Where interest rates are concerned, it is better to look at the effect of changes in **real interest rates** rather than in **nominal interest rates**. A nominal interest rate of 20 per cent in country A appears to be high relative to a nominal interest rate of 5 per cent in country B. However, if inflation in country A is running at 18 per cent per annum and only 2 per cent per annum in country B, then the real interest rates tell a different story: the real interest rate in country A is only 2 per cent, which is lower than the 3 per cent in country B (the ceteris paribus assumption includes factors like inflation rates – which, in the example, implies that the change in nominal interest rates results in exactly the same change in real interest rates.)

Exchange rates depend not only on the **relative growth of the money supply and real income** in various nations but also on inflation expectations and **expected changes in exchange rates**. Thus, an increase in the expected rate of inflation in a nation leads to an immediate equal depreciation of the nation's currency. *An expected change in the exchange rate will also lead to an immediate actual change in the exchange rate by an equal percentage.*
Since monetarists assume that domestic and foreign bonds are perfect substitutes, the interest differential between two countries will always equal the expected change in the exchange rate between the two currencies. That is,

- ***i*** is the interest rate in the home country (say, the United States),
- ***i**** is the interest rate in the foreign country (say, the European Monetary Union)
- ***EA*** is the expected percentage appreciation per year of the foreign currency (the €) with respect to the home country's currency (the $).

$$I - i^* = EA$$

If i = 6% and i^*=5%, then the expectation must be that the euro will appreciate by 1 percent at an annual basis in order to make the returns on investing in the European Monetary Union equal to the return or investing in the United States and thus be at uncovered interest parity.
If, for whatever reason, the expected appreciation of the euro (depreciation of the dollar) increased from 1 percent to 2 percent at an annual basis, this would make the return on investing in the European Monetary Union 7 percent per year (5 percent in interest and 2 percent from the expected appreciation of the euro at an annual basis) as compared to 6 percent return on the U.S. investment. This would lead to an immediate capital outflow from the United States to the European Monetary Union and actual appreciation of the euro by 1 percent per year, so as to go back to the expectation that the euro will appreciate by only 1 percent per year in the future and to uncovered interest parity, the converse will also be true. Furthermore, any change in the expected depreciation of the euro (appreciation of the dollar) will have to be matched by an equal actual depreciation of the euro (appreciation of the dollar), at an annual basis, so as to satisfy the condition for uncovered interest parity. Like the purchasing-power parity (PPP) theory and the law of one price, the uncovered interest arbitrage condition is an integral part of the monetary approach and exchange rate determination.

3.4 PORTFOLIO BALANCE MODEL AND EXCHANGE RATES (15.4)

The portfolio balance model can be regarded as a more realistic and satisfactory version of the monetary approach.

3.4.1 Portfolio Balance Model

The portfolio balance approach (or model) assumes that domestic and foreign bonds are imperfect substitutes because of the currency risk associated with foreign assets as well as the possibility of higher default risk. Money is thus viewed as merely one asset of many. The exchange rate is the rate which equates the **demand and supply for these (financial) assets**.

The **portfolio balance approach** (also called the asset market approach) differs from the monetary approach in

- that domestic and foreign bonds are assumed to be **imperfect substitutes**, and
- By postulating that the exchange rate is determined in the process of equilibrating or balancing the stock or **total demand and supply of financial assets** (of which money is only one) in each country.

Thus, the portfolio balance approach can be regarded as a more realistic and satisfactory version of the monetary approach. A change in any of these factors will cause a portfolio reallocation and to the degree that foreign bond sales change, the exchange rate will change.

In the simplest asset market model, individuals and firms hold their financial wealth in some combination of domestic money, a domestic bond, and a foreign bond denominated in the foreign currency. The incentive to hold bonds (domestic and foreign) results from the **yield or interest that they provide**. However, they also carry the risk of default and the risk arising from the variability of their market value over time. Domestic and foreign bonds are not perfect substitutes, and foreign bonds pose some additional risk with respect to domestic bonds. Holding domestic money, on the other hand, is riskless but provides no yield or interest.

Thus, the **opportunity cost** of holding domestic money is the yield forgone on holding bonds. The higher the yield or interest on bonds, the smaller is the quantity of money that individuals and firms will want to hold. Individuals and firms do want to hold a portion of their wealth in the form of money in order to make business payments (the **transaction demand for money**). But the higher the interest on bonds, the smaller is the amount of money that they will want to hold.

The foreign bond denominated in the foreign currency carries the additional risk that the **foreign currency may depreciate**, thereby imposing a capital loss in terms of the holder's domestic currency. But holding foreign bonds also allows the individual to **spread their risks** because disturbances that lower returns in one country are not likely to occur at the same time in other countries. Thus, a financial portfolio is likely to hold:

- **Domestic money** (to carry out business transactions),
- The **domestic bond** (for the return it yields), and
- The **foreign bond** (for the return and for the spreading of risks it provides).

Given the holder's tastes and preferences, his or her wealth, the level of domestic and foreign interest rates, his or her expectations as to the future value of the foreign currency, rates of inflation at home and abroad, and so on, he or she will choose the portfolio that maximizes his or her satisfaction.

According to the portfolio balance approach, equilibrium in each financial market occurs when the quantity demanded of each financial asset equals its supply. It is because investors hold **diversified and balanced portfolios** of financial assets that this model is called the portfolio balance approach. If investors demand more of the foreign bond either because the foreign interest rate rose relative to the domestic interest rate or because their wealth increased, the demand for the foreign currency increases and this **causes an increase in the exchange rate** (i.e., depreciation of the domestic currency).
On the other hand, if investors sell foreign bonds either because of a reduction in the interest rate abroad relative to the domestic interest rate or because of a reduction in their wealth, the supply of the foreign currency increases and this causes a **decrease in the exchange rate** (i.e., appreciation of the domestic currency). Thus, we see that the exchange rate is determined in the process of reaching equilibrium in each financial market.

3.4.2 Extended Portfolio Balance Model

In this section, we extend the simple portfolio balance model by specifying a more complete set of variables that determines the

- **demand for money *(M)***
- **the demand for the domestic bond *(D)* and**
- **The demand for the foreign bond *(F)* of residents** of the home country.

From our simple portfolio balance model we already know that *M, D*, and *F* depend on the domestic and the foreign interest rates (*i* and *i*).* The additional variables on which *M, D*, and *F* depend are the:

- expected change in the spot rate in the form of the expected appreciation of the foreign currency or ***(EA)***
- the risk premium (***RP***) required to compensate domestic residents for the additional risk involved in holding the foreign bond
- the level of real income or output (**Y**)
- the domestic price level (**P**)
- the wealth (**W**) of the nation's residents.

We know from the uncovered interest parity condition (Equation (15-8)) discussed in Section 15.3c in connection with the monetary approach that

$$i - i^* = EA$$

That is, the positive interest differential in favor of the home country (the United States) over the foreign country (the EMU) is equal to the expected appreciation (expressed on an annual percentage basis) of the foreign currency (€) in relation to the home-country currency ($). *EA* is now also included as an additional explanatory variable in the demand function for M, D, and F in the asset market model.

In addition, since the domestic and the foreign bond are now assumed to be imperfect substitutes, there is an extra risk in holding the foreign bond with respect to holding the domestic bond. This extra risk arises from unexpected changes in the exchange rate (currency risks) and/or limitations that foreign nations might impose on transferring earnings back home (country risks). The uncovered interest parity condition of Equation must, therefore, be extended to include the risk premium (RP) that is required to compensate home-country residents for the extra risk involved in holding the foreign bond. Thus, the condition for uncovered interest parity becomes:

$$i - i^* = EA - RP \text{ so that } i = i^* + EA - RP$$

The above postulates that:

- the *interest rate in the home country* **(i)** must be equal to
- the *interest rate in the foreign country* **(i*)** plus
- the *expected appreciation of the foreign currency* **(EA)** minus
- the *risk premium on holding the foreign bond* **(RP).**

E.G. If i = 4%, i* = 5%, and EA = 1 %, then RP on the foreign bond must equal 2 percent in order to be at uncovered interest parity (i.e., 4% — 5% + 1% -2%). If the RP were only 1 percent, it would pay for home-country residents to buy more foreign bonds until the interest parity condition is satisfied. Of course, if the domestic bond is more risky than the foreign bond, RP is entered with a positive sign in the equation.

The extended portfolio balance model also includes the real income or output of the nation (GDP), the price level (P), and the wealth (W) of the nation, as in the monetary approach. The extended demand functions for M, D, and F are thus given by the equations below, with the sign on top of each variable referring to the postulated direct (+) or inverse (-) relationship between the independent or explanatory variables shown on the right-hand side of each equation and the dependent or left-hand variable in each equation.

$$\overset{- \; - \quad - \quad + \; + \; + \; +}{M = f(i, i^*, EA, RP, Y, P, W)} \qquad (1)$$

$$\overset{+ \; - \quad - \quad + \quad - \; - \; +}{D = f(i, i^*, EA, RP, Y, P, W)} \qquad (2)$$

$$\overset{- \; + \quad + \quad - \quad - \; - \; +}{F = f(i, i, EA, RP, Y, P, W)} \qquad (3)$$

Equation 1 postulates that the:

- demand for domestic money by home-country residents (*M*) is
- inversely related to the interest rate in the home country (*i*),
- the interest rate in the foreign country (*i*),* and
- the expected appreciation of the foreign currency *(EA).*

$$M = f(i, i^*, EA, RP, Y, P, W) \quad (1)$$

(- - - + + + +)

That is, the higher *i,* f, and *EA*, the lower will be *M*. Higher domestic or foreign interest rates increase the opportunity cost of holding money balances, and so home-country residents will demand a smaller quantity of money. Similarly, the greater the expected appreciation of the foreign currency, the greater the opportunity cost of holding money and so *M* is also inversely related to *EA*. On the other hand, *M* is directly related to the risk premium required by home-country residents on holding the foreign bond (*RP*), the home-country real income (*Y*), prices (*P*), and wealth (*W*). That is, the greater the risk premium is on the foreign bond and the greater the real income, prices, and wealth are in the nation, the greater the demand is for money balances by the nation's residents.

Equation 2 postulates that the

- demand for the domestic bond (*D*) is
- directly related to *i, RP*, and *W*.

$$D = f(i, i^*, EA, RP, Y, P, W) \quad (2)$$

(+ - - + - - +)

That is, the greater the return on the domestic bond, the greater the demand for it. Similarly, the greater the risk premium on foreign bonds, the more home-country residents will hold domestic instead of foreign bonds. Furthermore, the greater the wealth of home-country residents, the more of the domestic and foreign bonds as well as money balances they will want to hold. On the other hand, D is inversely related to *i*,* EA, Y, and *P*. That is, the higher *i** is, the more of the foreign instead of the domestic bond home-country residents will want to hold. Similarly, the higher *Y* and *P* are, the more home-country residents demand money balances instead of *D* and *F*. Finally, the greater the wealth of home-country residents is, the higher *M, D*, and *F* will be.

Equation 3 postulates that:

- F is inversely related to RP, Y, and P and
- positively related to i*, EA, and W.

$$F = f(i, i^*, EA, RP, Y, P, W) \quad (3)$$

(- + + - - - +)

That is, the higher i is, the less home-country residents will want to hold the foreign bond. A higher risk premium on the foreign bond will lead home-country residents to demand less of the foreign bond. A higher Y and P will lead home-country residents to demand more money balances and less of the foreign (and the domestic) bond. On the other hand, home-country residents will demand more of the foreign bond, the higher is the interest on the foreign bond, the greater the expected appreciation of the foreign currency, and the greater their wealth.

Setting the demand for money balances (M), the domestic bond (D), and the foreign bond (F) equal to their respective supplies, which are assumed to be exogenous (i.e., determined outside the model), we get the equilibrium quantity of money balances, domestic bonds, and foreign bonds, as well as the equilibrium rates of interest in the home and in the foreign nations, and the exchange rate between their currencies. All of these equilibrium values are obtained simultaneously. Furthermore, since all three assets (domestic money, domestic bonds, and foreign bonds) are substitutes for one another, any change in the value of any of the variables of the model will affect every other variable of the model.

3.4.3 Portfolio Adjustments and Exchange Rates

We examine some portfolio adjustments to show how the extended portfolio balance model operates. Suppose that the home nation's monetary authorities engage in open market sales of government securities (bonds).

- This reduces the money supply as people pay for the bonds with money balances,
- depresses the bond price,
- and increases the interest rate in the nation (i).
- The rise in *i* leads to a reduction in *M* and *F* and an increase in *D* (see the sign of i in Equations 1-3).

That is, domestic residents buy more of the domestic bond at the expense of domestic money balances and the foreign bond.

Foreign residents also buy more of the domestic nation's bond at the expense of their own bond and currency. The reduced demand for the foreign bond:

- lowers its price and increases the foreign interest rate (*i*).*
- The inflow of funds to the home country also moderates the increase in the interest rate in the nation (*i*).

The sale of the foreign bond (F) and the purchase of the domestic bond (D) by domestic and foreign residents involve the sale of the foreign currency and purchase of the domestic currency, thus leading to an **appreciation of the domestic currency** and **depreciation of the foreign currency under flexible exchange rates**.

The increase in *i* and *i*,* as well as the appreciation of the domestic currency (depreciation of the foreign currency), may also lead to a:

- larger expected future appreciation of the foreign currency (*EA*) and
- reduction in the risk premium on holding the foreign bond (*RP*), now that less of the foreign bond is held.

In the end, however, when equilibrium is reestablished in all markets simultaneously, the uncovered interest parity condition (Equation $i = i^* + EA - RP$**)** will once again have to hold.

The level of real GDP, prices, and wealth in the nation (i.e., *y,* P, and *W*) and abroad (*Y*, P*,* and *W*)* are also likely to be affected by the change in *i*, *EA,* and *RD*, and these, in turn, will have further repercussions on all the other variables of the model.

Tracing all the effects and repercussions can be extremely complicated. The usefulness of the model for us now is that it shows the relationship among all of the variables of the model and forces us to take an overall or comprehensive view of the economy as a whole in determining equilibrium exchange rates.

As another example of an exogenous change, suppose that the foreign currency is expected to appreciate *(EA*) more than previously believed in the future. The primary effect of this is

- to reduce *M* and *D* and increase *F*. The reduction in *M* and *D* tends to
- reduce the interest rate in the nation (*i*),
- the outflow of funds resulting from domestic residents purchasing more of the foreign bond moderates the reduction of *i* and reduces *i** (the foreign interest rate).
- The increase in *F* by domestic residents also
- increases the demand for the foreign currency and leads to an appreciation of the foreign currency (depreciation of the domestic currency), which moderates the expected appreciation of the foreign currency (*EA*).

These changes are likely to affect the other variables and equations of the model for both domestic and foreign residents in the process of returning to equilibrium in all markets simultaneously. If instead of an increase in EA we had started with an increase in the risk premium (RP), the effects would have been the opposite of those discussed earlier.

Finally, consider the effect of an autonomous increase in the real income or *GDP* (Y) in the nation. From Equations we see that the immediate effect of this would be to:

- increase *M* and reduce *D* and *F*. The reduction in F will lead to
- an appreciation of the domestic currency (depreciation of the foreign currency) under flexible exchange rates or a balance-of-payments surplus for the nation under fixed exchange rates.
- These changes, in turn, will have further effects on all the other variables of the model until equilibrium is reestablished in all markets simultaneously.

Once equilibrium is reestablished, the exchange rate will stop changing and/or the balance-of-payments disequilibrium will be eliminated. *That is, according to the portfolio balance approach, an exogenous change in any of the variables of the model will bring about only temporary changes in exchange rates or in balance-of-payments disequilibria*. Exchange rate changes or balance-of-payments disequilibria over long periods of time can only mean that either adjustments to disequilibria are very slow or that continuous exogenous changes are taking place.

3.5 EXCHANGE RATE DYNAMICS (15.5)

With the high volatility of many floating exchange rates (such as the exchange rate between the South African rand and the currencies of its major trading partners) it is imperative that we look at the change in the exchange rate over time as it moves towards a new equilibrium.

3.5.1 Exchange Rate Overshooting

When an **exchange rate moves more than is necessary to reach its long-run value**, we say that it overshoots. Overshooting is thus per definition more of a short-run phenomenon.

We have seen previously that changes in interest rates, expectations, wealth, and so on disturb equilibrium and lead investors to reallocate financial assets to achieve a new equilibrium or balanced portfolio.

For example, an unanticipated increase in the nation's money supply leads to an immediate decline in the nation's interest rate. If all markets were originally in equilibrium, the decline in the nation's interest rate would lead investors to shift from domestic bonds to money balances and foreign bonds, as explained earlier. This stock adjustment can be very large and usually occurs immediately or over a very short time. This is to be contrasted to a change in the flow of merchandise trade that results from, say, a depreciation of the nation's currency and that takes place only gradually and over a longer period of time. (Previous contracts have to be honored, and new orders may take many months to fill.) Thus, stock adjustments in financial assets are usually much larger and quicker to occur than adjustments in trade flows.

The differences in the size and quickness of stock adjustments in financial assets as opposed to adjustments in trade flows have very important implications for the process by which exchange rates are determined and change (their dynamics) over time. For example, an unexpected increase in the nations' money supply and decline in domestic interest rates are likely to lead to a large and quick increase in the demand for the foreign currency as investors increase their stock of the foreign bond. This, in turn, leads to an immediate and large depreciation of the domestic currency, which is likely to swamp the smaller and more gradual charges in exchange rates resulting from changes in real markets, such as changes in trade flows. (Of course, the opposite would occur if the money supply increased and the interest rate declined abroad.) To be sure, in the long run, the effect on exchange rates of changes in real markets will prevail, but in the short or very short run (i.e., during the period of a day, week, or month), changes in exchange rates are likely to reflect mostly the effect of stock adjustments in financial assets and expectations. If the real sector responded immediately, as financial sectors do, there would be no exchange rate overshooting.

The preceding analysis can also help explain why, in the short run, exchange rates tend to overshoot or bypass their long-run equilibrium level as they move toward long-run equilibrium. Since adjustments in trade flows occur only gradually over time, most of the burden of adjustment in exchange rates must come from financial markets in the very short and short runs. Thus, the exchange rate must overshoot or bypass its long-run equilibrium level for equilibrium to be quickly reestablished in financial markets. Over time, as the cumulative contribution to adjustment coming from the real (e.g., trade) sector is felt, the exchange rate reverses its movement and the overshooting is eliminated.

STUDY UNIT 4 – THE PRICE ADJUSTMENT MECHANISM WITH FLEXIBLE AND FIXED EXCHANGE RATES

4.1 INTRODUCTION (16.1)

In this chapter we assume that there are no autonomous international private capital flows. That is, international private capital flows take place only as passive responses to cover temporary trade imbalances. We also assume that the nation wants to correct a deficit in its balance of payments by exchange rate changes. Since this traditional exchange rate model is based on trade flows and the speed of adjustment depends on how **responsive (elastic) imports and exports are to price (exchange rate)** changes, it is called the trade or **elasticity approach**.

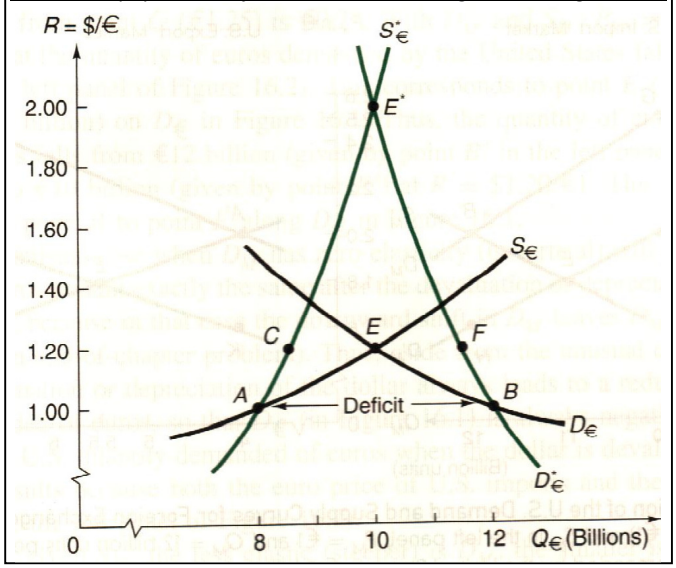
4.2 ADJUSTMENT WITH FLEXIBLE EXCHANGE RATES (16.2)

A **depreciation** implies a flexible exchange rate system. A **devaluation**, refers to a deliberate (policy) increase in the exchange rate by monetary authorities from a fixed or pegged level to another. Both are referred to as a **price adjustment mechanism**.

4.2A BALANCE-OF-PAYMENTS ADJUSTMENTS WITH EXCHANGE RATE CHANGES (16.2A)

The figure shows the process of correcting a deficit in a nation's balance of payments by a depreciation or devaluation of its currency.
It's assumed the United States and the European Monetary Union are the only two economies and there are no international capital flows, The U.S. demand and supply curve for euros reflect only **trade in goods and services**.
If the U.S. demand and supply curves for euros were given by D€ and S€ a 20 percent **devaluation or depreciation** of the dollar, from R = $1/€1 to R — S1.20/€ 1, would eliminate the U.S. deficit.
If the U.S. demand and supply curves for euros were **less elastic** (steeper), as indicated by D*€ and S*€, a 20 percent devaluation would only reduce the U.S. deficit to €3 billion (CF), and a 100 percent devaluation or depreciation of the dollar, from R = $1/€1 to R — $2/€l, would be required to completely eliminate the deficit (point E* in the figure).

Balance-of-payments Adjustments with exchange rate changes (F4.1)



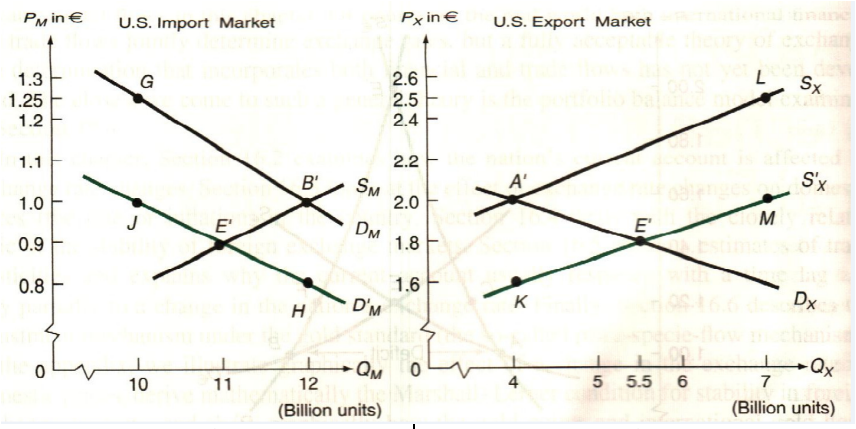
4.2B Derivation of the Demand Curve for Foreign Exchange (16.2b)

The U.S. demand curve for euros (D€) shown in figure 4.1 is derived from the demand and supply curves of U.S. imports in terms of euros, F4.2a. The U.S. supply curve for euros (S€) is derived from the demand and supply curves of U.S, F4.2b. exports in terms of euros. Let us start with the derivation of the U.S. demand curve for euros (D€).

With Dm (at R=$1/€1) and SM in the left panel, Pm = €1 and Qm = 12 billion units per year, so that the quantity of euros demanded by the United States is €12 billion (B').

This corresponds to point B' in F4.1. A 20

Derivation of the U.S. Demand and Supply Curves for Foreign Exchange (F4.2).



Dx is the EMU demand for U.S. exports in terms of euros

Sx is the U.S. supply of exports to the EMU at R=$1/1€

percent depreciation of the dollar shifts Dm down to D'm. Then Pm=€9.9 and Qm = 11 billion units, so that the quantity of euros demanded by the United States falls to €9.9 billion (point E - the left panel). This corresponds to point E (with €9.9 billion rounded to €10 billion) in figure 4.1.
With Dx and Sx (at R=$1/€1) in the right panel, Px=€2 and Qx=4 billion, the quantity of euros supplied to the United States is €8 billion (point A'). This corresponds to point A in Figure 4.1.
With a 20 percent depreciation or devaluation of the dollar, Sx shifts down to S'x. Then Px = €1.8 and Qx = 5.5 billion units, so that the quantity of euros supplied to the US rises to €9.9 billion (point E'). This corresponds to point E in Figure 4.1.

Only in the unusual case when DM has zero elasticity (vertical) will the US. quantity demanded of euros remain exactly the same, because in that case the downward shift in Dm leaves Dm unchanged. Aside from the unusual case where DM is vertical, a **devaluation or depreciation of the dollar always leads to a reduction in the U.S. quantity demanded of euros,** so that D€ (in Figure 4.1) is always negatively sloped. The reduction in the U.S. quantity demanded of euros when the dollar is devalued or is allowed to depreciate results because both the euro price of U.S. imports and the quantity of U.S. imports fall.
Furthermore, given Sm, the less elastic (steeper) is Dm, the smaller is the reduction in the U.S. quantity demanded of euros and the less elastic (steeper) is the U.S. demand curve for euros. In that case, a 20 percent devaluation of the dollar might be represented by a movement from point B to point F along D*€ rather than by a movement from point B to point £ along in Figure 4.1.

4.2B Derivation of the Supply Curve for Foreign Exchange (16.2b)

In the right panel of Figure 4.2, Dx is the EMU demand for U.S. exports in terms of euros, and Sx is the U.S. supply of exports to the EMU at R=$1/€1. With Dx and Sx, the euro price of U.S. exports is Px = €2, and the quantity of U.S. exports is Qx = 4 billion units, so that the U.S. quantity of euros earned or supplied is €8 billion (point A' in the right panel of Figure 16.2). This corresponds to point A on S€ in Figure 4.1.

When the dollar is devalued or is allowed to depreciate by 20 percent, Dx remains unchanged, but Sx shifts down by 20 percent to S'x. The reason is that the United States would now be willing to export 4 billion units at the euro price of Px = €1.6, or 20 percent lower is because each euro is now worth 20 percent more in terms of dollars (point K on S'x in the figure). However, at euro prices below Px = €2, the European Monetary Union will demand greater quantities of U.S. exports (i.e., the EMU will move down along Dx), while the United States will supply greater quantities of exports at euro prices above Px = €1.6 (i.e., the United States will move up along Sx), until the new equilibrium point E' is reached.

Note that S'x is not parallel to Sx because the shift is of a constant percentage. With Dx and Sx, Px = €1.8 and Qx = 5.5 billion units, so that the quantity of euros supplied to the United States increases to €9.9 billion (1.8 times 5.5). This is given by point E' and corresponds to point E in figure 4.1. Thus, the quantity of euros supplied to the US rises from €8 billion to €10 billion. This corresponds to a movement from point A to point E along in Figure 4.1.

Devaluation of the dollar reduces the euro price but increases the quantity of U.S. export (E to point A in the right panel of Figure 4.2). Since in this case the percentage increase in Qx exceeds the percentage reduction in Px, **Dx is price elastic**, and the quantity of euros supplied to the US increases. If Dx in the right panel of Figure 4.2 had been less elastic (steeper), the same 20 percent devaluation might have resulted in a movement from point A to point C along S*€ in Figure 16.1 rather than from point A to point E along S€. Thus, **the less elastic is Dx, the less elastic is the derived U.S. supply curve for euros (S€)**.

If Dx had been unitary elastic, the devaluation or depreciation of the dollar would have left the U.S. quantity supplied of euros completely unchanged, so that the U.S. supply curve of euros would have been vertical, or have zero elasticity. The same would be true if Sx were vertical, so that a depreciation or devaluation of the dollar would leave Sx unchanged.
Finally, if Dx had been price inelastic, a devaluation or depreciation of the dollar would have actually reduced the U.S. quantity supplied of euros, so that the U.S. supply curve of euros would have been negatively sloped.
Thus, while the U.S. demand curve for euros is almost always negatively sloped, the U.S. supply curve of euros could be **positively sloped, vertical, or even negatively sloped**

4.3 EFFECT OF EXCHANGE RATE CHANGES ON DOMESTIC PRICES AND THE TERMS OF TRADE (16.3)

A depreciation of the dollar stimulates the production of U.S. **import substitutes and exports** and lead to a **rise in prices in the U.S**. While a devaluation or depreciation of the dollar **reduces the euro price of U.S. imports** and exports, it **increases the dollar price of U.S. import substitutes and exports and is inflationary**. Some conclusions to note:

- The **greater the depreciation**, the **greater is its inflationary impact** and the less feasible is the increase of the exchange rate as a method of correcting the deficit.
- The increase in the dollar price of import substitutes and exports is a necessary incentive for U.S. producers to **shift resources from the production of purely domestic goods to the production of import substitutes and exports** and reduces the price advantage conferred on the United States by the devaluation or depreciation of the dollar.
- A depreciation is also likely to **affect the nation's terms of trade**. The terms of trade of the nation can rise, fall, or remain unchanged, depending on whether the price of exports rises by more than, less than, or the same percentages as the price of imports.

From Figure 4.2 as a result of the 20 percent depreciation or devaluation of the dollar and we can use these prices to measure the **change in the U.S. terms of trade**. Before the depreciation or devaluation of the dollar, Px = €2 (point A' in the right panel) and Pm=€1 (point B' in the left panel), so that Px/Pm=2/1=2, or 200%. After the 20 percent depreciation of the dollar, Px = €1.8 (point E' in the right panel) and Pm=€0.9 (point E' in the left panel), so that Px/Pm = 1.8/0.9 = 2, or 200 percent. Therefore, the U.S. terms of trade in this case remain unchanged. In general, however, we can expect the terms of trade of a nation to change when its currency is devalued or allowed to depreciate.

16.4 STABILITY OF FOREIGN EXCHANGE MARKETS (16.3)

16.4A STABLE AND UNSTABLE FOREIGN EXCHANGE MARKETS (16.3a)

Stable foreign exchange market is when a disturbance from the equilibrium exchange rate gives rise to forces that push the exchange **rates back toward** the equilibrium level.
The supply curve of foreign exchange is positively sloped or, if negatively sloped, is less elastic (steeper) than the demand curve of foreign exchange.

An unstable foreign exchange market is when a disturbance from the equilibrium exchange rate gives rise to forces pushes the exchange **rate further away** from equilibrium.
A foreign exchange market is unstable if the supply curve is negatively sloped and more elastic (flatter) than the demand curve of foreign exchange.

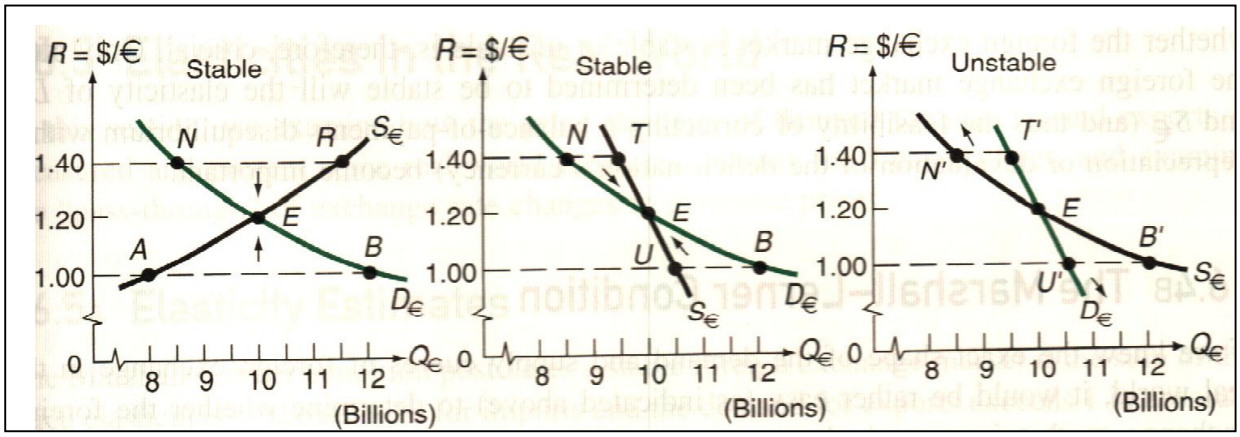


Figure 4.3 Stable and Unstable Foreign Exchange Markets.
In all three panels, the equilibrium exchange rate is R = $1.20/€1, at which €10 billion are demanded and supplied per year. If, the equilibrium is disturbed and the exchange rate falls, say to R = $1/€1, the excess demand for foreign exchange in the left and center panels will push the exchange rate back up toward the equilibrium rate, but the excess supply of foreign exchange in the right panel will cause the exchange rate to fall even lower. Similarly, at R = $1.40/€l, the excess supply in the left *and* center panels will drive *the* exchange *rate down toward* R= *$1-20/€1, but the* excess demand in the right panel will push the exchange rate even higher. Thus, the left and center panels depict stable markets, while the right panel depicts an unstable market.

4.4B THE MARSHALL-LERNER CONDITION (16.4b)

The Marshall-Lerner condition tells us whether the foreign exchange market is stable or unstable. The simplified version is valid when the supply curves of imports and exports (i.e. Sm and Sx) are both **infinitely elastic, or horizontal**. The Marshall-Lerner condition indicates

- **The market is stable** - If the sum of the price elasticities of the demand for imports (Dm) and the demand for exports (Dx), in absolute terms, is greater than 1.
- **The market is unstable -** If the sum of the price elasticities of Dm and Dx is less than 1, in absolute terms.
- The **balance of payments won't change -** If the sum of these two demand elasticities is equal to 1, in absolute terms.

4.5 ELASTICITIES IN THE REAL WORLD (16.5)

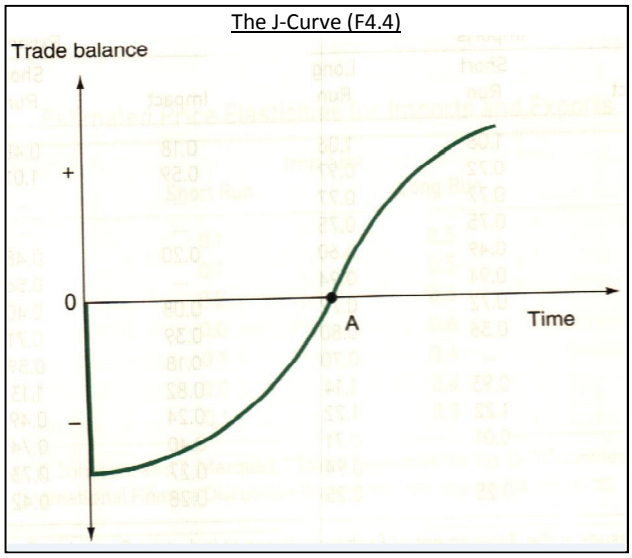
4.5A ELASTICITY ESTIMATES (16.5a)

Junz and Rhomberg identified five lags in the quantity response to price changes in international trade. These are:

1. **Recognition lag -** before the price change become evident
2. **Decision lag -** to take advantage of the change in prices
3. **Delivery lag -** of new orders placed as a result of price changes,
4. **Replacement lag -** to use up available inventories before new orders are placed
5. **Production lag -** to change the output mix as a result of price changes.

4.5BB THE J-CURVE EFFECT AND REVISED ELASTICITY ESTIMATES (16.5b)

The J-Curve (F4.4)



The J-curve effect - The tendency of a nation's trade balance to first deteriorate before improving as a result of a devaluation or depreciation in the nation's currency.
A nation's trade balance may actually worsen before improving after a devaluation or depreciation. This is due to the tendency of the **domestic-currency price of imports to rise faster than export prices** soon after the devaluation or depreciation. The reason is that when the nation's net trade balance is plotted on the vertical axis and time is plotted on the horizontal axis, the response of the trade balance to a devaluation or depreciation looks like the curve of a J. The figure assumes that the original trade balance was zero. Starting from the origin and a given trade balance, a devaluation or depreciation of the nation's currency will first result in a deterioration of the nation's trade balance before showing a net improvement (after time A).

4.5C CURRENCY PASS-THROUGH (16.5c)

The increase in the domestic price of the imported commodity may be smaller than the amount of the depreciation—even after lags. That is, the **pass-through from depreciation** to domestic prices may be less than complete. For example, a 10 percent depreciation in the nation's currency may result in a less than 10 percent increase in the domestic-currency price. The reason is that foreign firms, having **struggled to successfully establish and increase their market share** in the nation, may be very reluctant to risk losing it by a large increase in the price of its exports and are usually willing to absorb some of the price increase. A foreign firm may only increase the price of its export commodity by 4 percent and accept a 6 percent reduction in its profits for fear of losing market share. That is, **the pass-through is less than 1**. The pass-through is higher in the long run than the short run and higher for industrial goods than for other goods.
Exporters may be reluctant to increase prices by the full amount of the depreciation if they do not believe the depreciation of the will persist and not be reversed in the near future. This has been referred to as the **beachhead effect**.

4.6 ADJUSTMENT UNDER THE GOLD STANDARD (16.6)

The gold standard also relies on an automatic price mechanism for adjustment but of a different type from the one operating under a flexible exchange rate system.

4.6A THE GOLD STANDARD (16.6a)

The gold standard operated from about 1880 to the outbreak of World War I in 1914. An attempt was made to reestablish the gold standard after the war, but it failed in 1931 during the Great Depression. It is very important to understand the advantages and disadvantages inherent in the operation of the gold standard.

Under the gold standard, each nation defines the gold content of its currency and stands ready to buy or sell any amount of gold at that price. Since the gold content in one unit of each currency is fixed, exchange rates are also fixed. For example, under the gold standard, a £1 gold coin in the United Kingdom contained 113.0016 grains of pure gold, while a $1 gold coin in the United States contained 23.22 grains. This implied that the dollar price of the pound, or the exchange rate, was R = $/£ — 113.0016/23.22 = 4.87. This is called the **mint parity.**

Since the cost of shipping £1 worth of gold between New York and London was about 3 cents, the exchange rate between the dollar and the pound could never fluctuate by more than 3 cents above or below the mint parity. This was the **gold export point** of the United States.

On the other hand, the exchange rate between the dollar and the pound could not fall below $4.84. This was the **gold import point** of the United States.

The tendency of the dollar to depreciate, or the exchange rate to rise above R = $4.90/£1, was countered by gold shipments from the United States. These gold outflows measured the size of the U.S. balance-of-payments deficit. On the other hand, the tendency of the dollar to appreciate, or the exchange rate to fall below R — $4.84/£1, was countered by gold shipments to the United States. These gold inflows measured the size of the surplus in the U.S. balance of payments. Since deficits are settled in gold and nations have limited gold reserves, deficits cannot go on forever but must soon be corrected..

4.6B THE PRICE-SPECIE-FLOW MECHANISM (16.6b)

David Hume introduced the price-specie-flow mechanism, it is the automatic adjustment mechanism under the gold standard. This operates to correct balance-of-payments disequilibria; Since each nation's money supply under the gold standard consisted of either gold itself or paper currency backed by gold, the money supply would fall in the deficit nation and rise in the surplus nation. This caused internal prices to fall in the deficit nation and rise in the surplus nation. As a result, the exports of the deficit nation would be encouraged and its imports would be discouraged until the deficit in its balance of payments was eliminated.

The reduction of internal prices in the deficit nation as a result of the gold loss and reduction of its money supply was based on the **quantity theory of money**. This can be explained by equation:

MV=PQ

Where:

- M - is the nation's money supply
- V - is the velocity of circulation of money
- P - is the general price index
- Q - is physical output

If the deficit nation lost gold, its money supply would fall and cause internal prices to fall proportionately. For example, a deficit in the nation's balance of payments and gold loss that reduced M by 10 percent would also reduce P by 10 percent in the nation. This would encourage the exports of the deficit nation and discourage its imports. The opposite would take place in the surplus nation. That is, the increase in the surplus nation's money supply (due to the inflow of gold) would cause its internal prices to rise. This would discourage the nation's exports and encourage its imports. The process would continue until the deficit and surplus were eliminated.

Note that the **adjustment process is automatic**; it is triggered as soon as the balance-of-payments disequilibrium arises and continues to operate until the disequilibrium is entirely eliminated. Note also that the adjustment relies on a change in internal prices in the deficit and surplus nations.

STUDY UNIT 5 – THE NCOME ADJUSTMENT MECHANISM AND SYNTHESIS OF AUTOMATIC ADJUSTMENTS

5.5 THE ABSORPTION APPROACH (17.5)

In the absorption approach we **integrate and examine the automatic price and income adjustment mechanisms**. We examine the effect automatic income changes in the process of correcting a deficit in the nation's balance of payments through a depreciation or devaluation of the nation's currency.
Because the improvement in the nation's trade balance depends on the price elasticity of demand for its exports and imports, this method of correcting a deficit is referred to as **the elasticity approach**. The improvement in the deficit nation's trade balance arises because a depreciation or devaluation stimulates the nation's exports increasing local production and discourages its imports.
If the deficit nation is already at full employment, production cannot rise. Then, only if **real domestic absorption** (i.e., expenditures) is reduced will the depreciation or devaluation eliminate or reduce the deficit in the nation's balance of payments. If real domestic absorption is not reduced, either automatically or through contractionary fiscal and monetary policies, the depreciation or devaluation will lead to an increase in domestic prices that will completely neutralize the competitive advantage conferred by the depreciation or devaluation without any reduction of the deficit.

The main idea behind the absorption approach is that, *ex post facto,* the trade or current account balance (**X – M)** (also called net exports or the export surplus) must, equal the difference between domestic production (**Y)** and domestic spending (**A)** (absorption):

$$X - M = Y - A$$

The identity implies that a current account deficit can be reduced either by decreasing domestic spending (absorption) or by increasing output and national income (or both). The opposite applies in the case of a current account surplus. The right-hand side of the equation shows the implicit amount of net saving in the economy and the equation can be rewritten more explicitly in this form:

$$X - M = (S - I) + (T - G)$$

where **S**, **I**, **T**, and **G** are private saving, investment spending, tax revenue and government spending respectively (keep in mind that this income accounting identity includes any changes in inventories as part of **I**). The above equation tells us that the current account balance equals the sum of (net) private saving **(S – I)** and government saving (**T – G)** (the budget surplus or deficit).

The effect of devaluation on the current account balance depends on the degree of unemployment and excess capacity in the economy:

- Devaluation increases foreign demand for exports and domestic demand for locally produced import substitutes. If there are unemployed resources, output can rise to meet the increased demand.
- Hence Y also rises. As income rises, so do induced consumption spending and imports.
- An increase in the current account balance depends on income rising by more than domestic spending or absorption.
- The marginal propensity to consume (ie the fraction of an increase in income that is consumed) is typically less than one (owing to the fraction of the increase in income that is saved), although this may not always be the case.
- Devaluation to improve the current account balance may then require supplementary restrictive monetary or fiscal policies aimed at reducing absorption.
- If there is full employment, then the increase in demand resulting from devaluation cannot be met by increased output, and prices will rise instead. Thus absorption would have to be reduced for devaluation to improve the current account balance.

While the **elasticity approach stresses the demand side** and implicitly assumes that slack exists in the economy that will allow it to satisfy the additional demand for exports and import substitutes, **the absorption approach stresses the supply side** and implicitly assumes an adequate demand for the nation's exports and import substitutes. Both the elasticity approach and the absorption approach are important and both must be **considered simultaneously**.

5.6 MONETARY ADJUSTMENTS AND SYNTHESIS OF THE AUTOMATIC ADJUSTMENTS (17.6)

5.6A MONETARY ADJUSTMENTS (17.6a)

When the exchange rate is not freely flexible, a deficit in the balance of payments can reduce the nation's money supply due to the **excess foreign currency demanded**. The loss of reserves causes the nation's money supply to fall by a multiple of the trade deficit. Unless **sterilized**, or **neutralized** the reduction in the money supply induces interest rates to rise in the deficit nation.

The rise in interest rates in the deficit nation discourages domestic investment and reduces national income and this induces a decline in the nation's imports, which reduces the deficit. The rise in interest rates attracts foreign capital, thus helping the nation to finance the deficit. The opposite occurs in the surplus nation. Indeed, it is through these international capital flows and automatic income changes that adjustment seems actually to have occurred under the gold standard.
The reduction in its money supply and income also tends to reduce prices in the deficit nation relative to the surplus nation, further improving the trade balance of the defies nation. This adjustment through changes in internal prices is theoretically most pronounced and direct under the gold standard, but it also occurs under other international monetary systems.
This automatic monetary-price adjustment mechanism could by itself eliminate the nation's trade deficit and unemployment, but only in the long-run. In what follows, we assume that a change in the money supply affects the balance of payments through both interest rate changes and changes in internal prices

5.6B SYNTHESIS OF AUTOMATIC ADJUSTMENTS (17.6b)

Now **integrate the automatic price, income, and monetary adjustments** for a nation that faces unemployment and a deficit it its balance of payments at the equilibrium level of income.

- **Under a freely flexible exchange** rate system and a stable foreign exchange market, the nation's currency will depreciate until the deficit is entirely eliminated.
- **Under a managed float**, the nation's monetary authorities usually do not allow the full depreciation required to eliminate the deficit completely.
- **Under a fixed exchange** rate system the exchange rate can depreciate only within the narrow limits so the balance-of-payments adjustment must come from elsewhere.

A depreciation stimulates production and income in the deficit nation and induces imports to rise, thus reducing the trade balance resulting from the depreciation.
Under a freely flexible exchange rate system, a balance-of-payments deficit tends to **reduce the nation's money supply**, thus **increasing its interest rates**. This, in turn, reduces domestic investment and income in the deficit nation, which induces its imports to fall and thereby reduces the deficit. The increase in interest rates also **attracts foreign capital**. The reduction in income and in the money supply also causes prices in the deficit nation to fall relative to prices in the surplus nation, thus further improving the balance of trade of the deficit nation.
Under a fixed exchange rate system, most of the automatic adjustment would have to come from the **monetary adjustments**, unless the nation devalues its currency.
When all of these automatic price, income, and monetary adjustments are allowed to operate, the adjustment to balance-of-payments disequilibria is likely to be more or less complete even under a fixed exchange rate system. The problem is that automatic adjustments frequently have serious disadvantages.

5.6C DISADVANTAGES OF AUTOMATIC ADJUSTMENTS (17.6c)

The disadvantages facing a freely flexible exchange rate system may be:

- **Overshooting and erratic fluctuations** in exchange rates. These interfere with the flow of international trade and impose costly adjustment burdens.
- Under a managed floating exchange rate system, monetary authorities may manage the exchange rate so as to keep the domestic currency undervalued to stimulate the economy at the expense of other nations thus **inviting retaliation**.
- A devaluation under a fixed exchange rate system can lead to **destabilizing international capital flows.**
- A fixed exchange rate system also forces a nation to rely **primarily on monetary adjustments**.
- A nation facing an autonomous increase in its imports at the expense of domestic production would have to allow its **national income to fall in** order to reduce its trade deficit.
- A nation facing an autonomous increase in its exports from a position of full employment would have to accept **domestic inflation to eliminate** the trade surplus.
- For the automatic monetary adjustments to operate, the nation must passively allow its **money supply to change** as a result of balance-of-payments disequilibria and thus give up its use of monetary policy to achieve the more important objective of **domestic full employment** without inflation.

STUDY UNIT 6 – OPEN ECONOMY MACROECONOMICS: ADJUSTMENT POLICIES

6.1 INTRODUCTION (18.1)

Internal balance - The basic objective of macroeconomic policy is to maintain full employment with price stability.
External balance - The equilibrium in the balance of payments.
The most important economic goals or objectives of nations are:

1. **Internal balance**
2. **External balance**
3. **A reasonable rate of growth**
4. **An equitable distribution of income**
5. **Adequate protection of the environment.**

Taking a balance of payments deficit as an example, there are five main options or choices:

1. **Finance the deficit -** An option is for the central bank to accommodate the imbalance by financing the net outflows of foreign exchange. The central bank allows the stock of foreign exchange reserves to be run down, or it draws on credit facilities granted by foreign banks. This is a temporary measure.
2. **Allow the exchange rate to float and to be determined by market forces -** Market forces of supply and demand lead to rapid adjustments in the exchange rate which automatically ensure that the existing stocks of foreign currency are willingly held and that net outflows are zero over time.
3. **Expenditure-reducing and expenditure-switching policies -** can be used to reduce aggregate demand and/or induce spending away from imports towards exports and locally produced import substitutes. Devaluation is the main example of expenditure-switching policy. Restrictive monetary and fiscal policies are examples of expenditure-reducing policies.
4. **Apply direct controls -** exchange controls can be used to enable the central bank to ration the available inflows of foreign exchange. It is more common for them to be used under a fixed or pegged exchange rate system.
5. **Use a combination of these approaches (a mixed option) -** Because each of the above options has both advantages and disadvantages, most countries adopt a mixed option and try to find a combination of policies that best suits their particular circumstances.

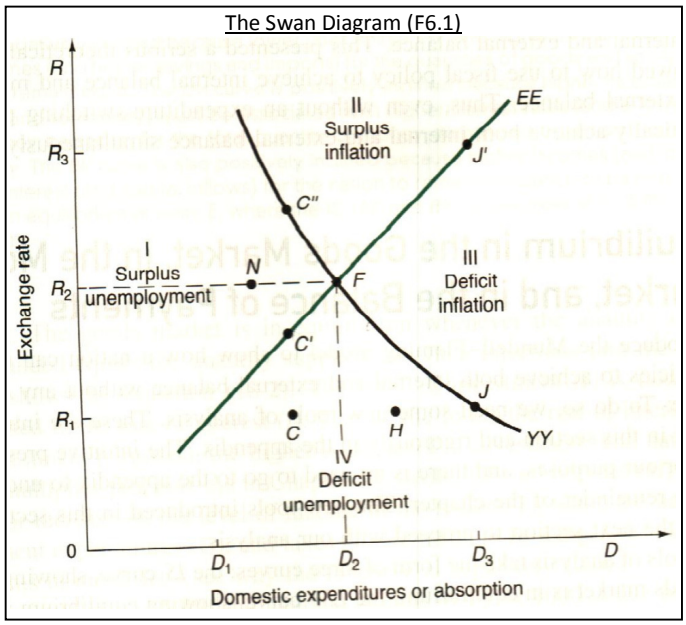
6.2 INTERNAL AND EXTERNAL BALANCE WITH EXPENDITURE-CHANGING AND EXPENDITURE SWITCHING POLICIES: THE SWAN ANALYSIS (18.2)

The possibility of a policy conflict arises when we consider internal and external balance simultaneously. How can a nation simultaneously attain internal and external balance with expenditure-changing and expenditure-switching policies. For simplicity we assume:

- A **zero/no international capital flow** so that the balance of payments is equal to the nation's trade balance.
- **Prices remain constant** until aggregate demand begins to exceed the full-employment level of output

The vertical axis measures the **exchange rate (R)**. An increase in R refers to a devaluation and a decrease in R to a revaluation.
The horizontal axis measures **real domestic expenditures**, or absorption (D). Besides domestic consumption and investments. D also includes government expenditures (which can be manipulated in the pursuit of fiscal policy).

The Swan Diagram (F6.1)



The EE curve shows the various combinations of exchange rates and real domestic expenditures, or absorption, that result in external balance. The EE curve is positively inclined because a higher R (due to a devaluation) improves the nation's trade balance (if the Marshall-Lerner condition is satisfied) and must be matched by an increase in real domestic absorption (D) to induce imports to rise sufficiently to keep the trade balance in equilibrium and maintain external balance.
The YY curve shows the various combinations of exchange rates (R) and domestic absorption (D) that result in internal balance (i.e., full employment with price stability). The YY curve is negatively inclined because a lower R (due to a revaluation) worsens the trade balance and must be matched with larger domestic absorption (D) for the nation to remain in internal balance.

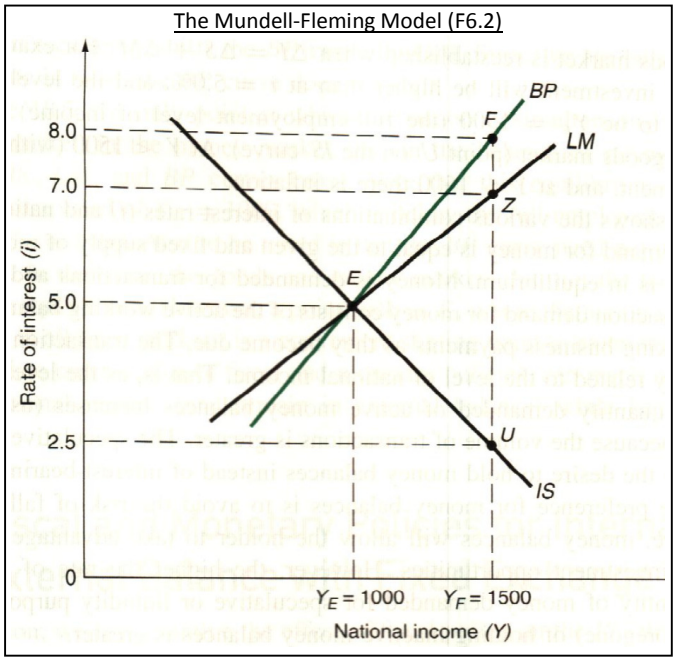
At point F (R2 and D2), where the EE and YY curves intersect, will the nation be simultaneously in external and internal balance. With points above the EE curve **referring to external surpluses** and points below **referring to deficits**, and with points below the YY curve **referring to unemployment** and points above **referring to inflation**, we can define the following four zones of external and internal imbalance (see the figure):

- **Zone I -** External surplus and internal unemployment
- **Zone II -** External surplus and internal inflation
- **Zone III -** External deficit and internal inflation
- **Zone IV -** External deficit and internal unemployment

We can determine the combination of expenditure-changing and expenditure-switching policies required to reach point F. For example, starting from point C (deficit and unemployment), both the exchange rate (R) and domestic absorption (D) must be increased to reach point F.

6.3 EQUILIBRIUM IN THE GOODS MARKET, IN THE MONEY MARKET AND IN THE BALANCE OF PAYMENTS (18.3)

The **Mundell—Fleming model** (IS-LM-BP)is used to show how a nation can use fiscal and monetary policies to achieve both internal and external balance without any change in the exchange rate.



Analysis take the form of three curves:

- **The IS curve,** showing all points at which the **goods market** is in equilibrium. It is negatively inclined because lower rates of interest mean high incomes and higher investment.
- **The LM curve**, showing equilibrium in the **money market**. It is positively inclined because higher incomes must be associated with higher interest rates for the total quantity of money demanded to remain equal to the given supply of money. Money is demanded for **transactions** and **speculative** purposes.
- **The BP curve**, showing equilibrium in the **balance of payments**. It is also positively inclined because higher incomes and imports require higher rates of interest and capital inflows for the nation to remain in balance-of-payments equilibrium.

The basic idea is that the presence of **interest-sensitive capital flows** allows internal and external equilibrium to be reached simultaneously, using only expenditure-changing policies. This is because monetary and fiscal policies have different effects on the domestic interest rate and hence on capital flows and the financial account of the balance of payments.

6.4 FISCAL AND MONETARY POLICIES FOR INTERNAL AND EXTERNAL BALANCE WITH FIXED EXCHANGE RATES (18.4)

The effect of **fiscal policy on the IS curve** and the effect of **monetary policy on the LM curve**, and how fiscal and monetary policies can be used to reach internal and external balance from a position of **external balance and unemployment** or starting from a condition of unemployment and deficit in the BOP, and finally assuming that capital flows are perfectly elastic.

6.4A FISCAL AND MONETARY POLICIES FROM EXTERNAL BALANCE AND UNEMPLOYMENT (18.4a) – (Fixed exchange rates)

An expansionary fiscal policy in the form of an **increase in government expenditures** and/or **a reduction in taxes** shifts the *IS* curve to the right so that at each rate of interest the goods market is in equilibrium at a higher level of national income.

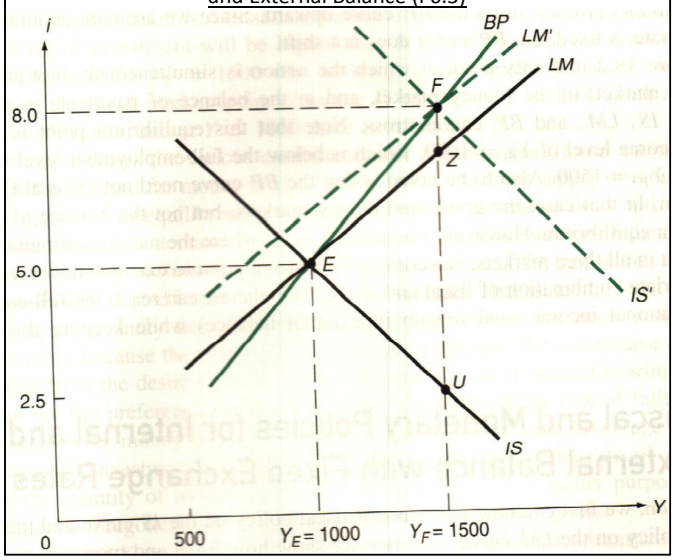
- A **contractionary fiscal policy** shifts the *IS* curve to the left.
- **An expansionary fiscal policy** shifts the *IS* curve to the right.
- An **easy monetary policy** in the form of an increase in the nation's money supply shifts the *LM* curve to the right
- A **tight monetary policy** reduces the nation's money supply and shifts the *LM* curve to the left.

Monetary and fiscal policies will **not directly affect the *BP* curve**, and since we are here assuming that the exchange rate is fixed, the ***BP* curve remains unchanged**

Starting from point E with domestic unemployment and external balance, the nation can reach the full-employment level of national income of *Yf=1500* with external balance by pursuing the expansions fiscal policy that shifts the *IS* curve to the right to *IS'* and the tight monetary policy that shifts the *LM* curve to the left to *LM'*, while holding the exchange rate fixed. All three markets are then in equilibrium at point *F*, where curves *IS'* and *LM'* cross on the unchanged *BP* curve at *i*=8.0% and *Yf*=1500.

Two conflicting policies (an expansionary fiscal policy and a tight monetary policy) are required for this nation to reach internal and external balance simultaneously.

Fiscal and Monetary Policies from Domestic Unemployment and External Balance (F6.3)

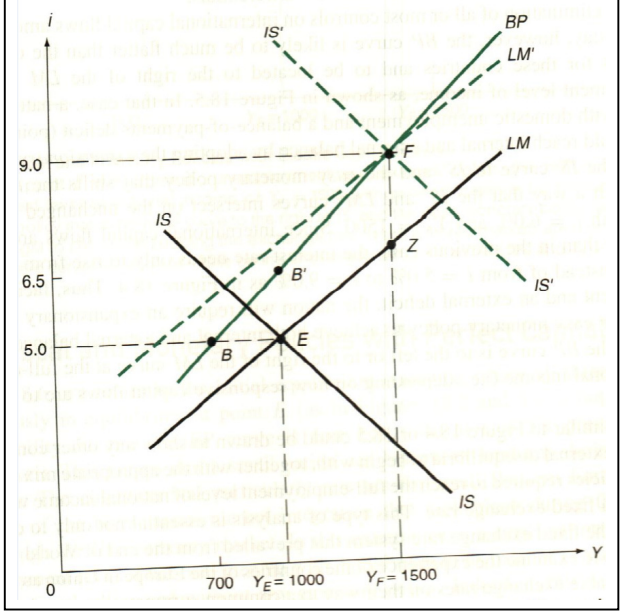


6.4B FISCAL AND MONETARY POLICIES FROM EXTERNAL DEFICIT AND UNEMPLOYMENT (18.4b) – (Fixed exchange rates)

Figure 18.4 shows an initial situation where the IS and LSI curves intersect at point E (as in Figures 18.2 and 18.3) but the BP curve does not. That is the domestic economy is in equilibrium (with unemployment) at *i= 5.0%* and *Yf* = 1000 but the nation faces a deficit of *300 (1000-700)* times the **marginal propensity to import *(*MPM)** in its balance of payments because point E is to the right of point B on the BP curve. If *MPM*=0.15, the deficit in the nation's balance of payments is *(300) (0.15) = 45*.

Starting from point E with domestic unemployment and external deficit, the nation can reach the full-employment level of national income of *Yf = 1500* with external balance by pursuing the **expansionary fiscal policy that shifts the *IS* curve to the right** to *IS'* and the **tight monetary policy that shifts the *LM* curve to the left** to *LM'*, while keeping the exchange rate fixed. All three markets are then in equilibrium at point *F,* where curves *IS'* and *LM'* cross on the unchanged *BP* curve *at i = 9.0%* and *Yf* = 1500. Because of the original external deficit, the nation now requires a higher interest rate than in Figure 6.3 to reach external and internal balance.

Fiscal and Monetary Policies from Domestic Unemployment and External Deficit (F6.4)



6.4C FISCAL AND MONETARY POLICIES WITH ELASTIC CAPITAL FLOWS (18.4c) – (Fixed exchange rates)

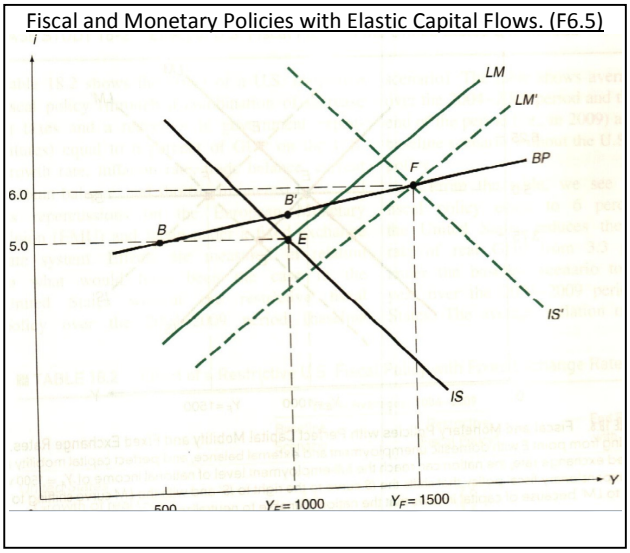
Figure 6.4, reveals that a tight monetary policy was required only because the BP curve was steeper than the LM curve and was located to the left of the LM curve at the full-employment level of national income (YF). This implies that international capital flows are not very responsive to changes in international interest differentials.

With the elimination of **most controls on international capital flows** the BP curve is likely to be much flatter than the one shown in Figure 6.4 and to be located to the right of the LM curve at the full-employment level of income, see Figure 6.5.

Starting from point E with domestic unemployment and external deficit, the nation can reach the full-employment level of national income of *YF* = 1500 with external balance by pursuing the **expansionary fiscal policy** that shifts the *IS* curve to the right to *IS'* and the easy monetary policy that shifts the LM curve to the right to *LM',* while keeping the exchange rate fixed. All three markets are then in equilibrium at point *F*, where curves *IS'* and *LM'* cross on the unchanged *BP* curve at *i* = 6.0% and *Yf* = 1500.

Thus, facing domestic unemployment and an external deficit, the nation will require an **expansionary fiscal policy** but a **tight or easy monetary policy** to achieve both internal and external balance, depending on whether the BP curve is to the left or to the right to the LM curve at the full-employment level of national income (i.e., depending on how responsive capital flows are to interest rate differentials).

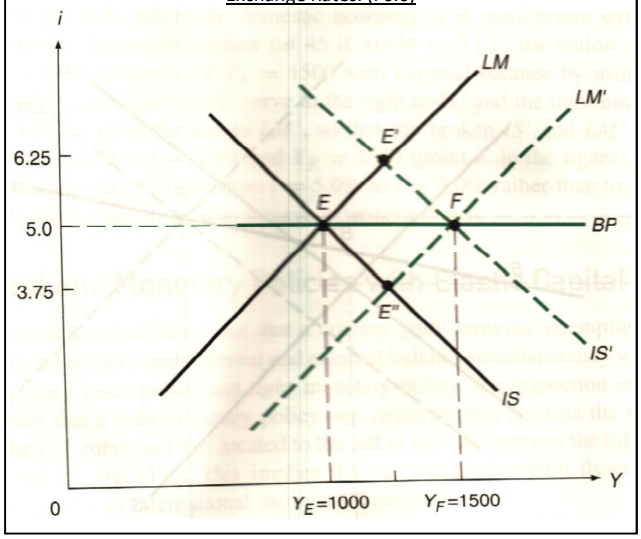
Fiscal and Monetary Policies with Elastic Capital Flows. (F6.5)



6.4D FISCAL AND MONETARY POLICIES WITH PERFECT CAPITAL MOBILITY (18.4d) – (Fixed exchange rates)

The initial equilibrium condition where all three markets are simultaneously in equilibrium at point E, but with **perfect capital mobility** so that the BP curve is now horizontal at *i* = 5% prevailing on the world market. This means that a small nation can borrow or lend any amount at 5.0%. In this extreme case, a small nation can reach the full-employment level of national income with equilibrium in its balance of payments by the **appropriate fiscal policy and without any monetary policy**. Monetary policy would be **entirely ineffective** in **perfect capital mobility** and **fixed exchange rates**. This can be shown as follows;

Fiscal and Monetary Policies with Perfect Capital Mobility and Fixed Exchange Rates. (F6.6)



Starting from point E the small nation should pursue the expansionary fiscal policy that shifts the *IS* curve to the right to *IS'* so that it crosses the horizontal BP curve at point *F*, at *YF*=1500. The intersection of the broken *IS'* curve with the unchanged *LM* curve at point *E'* indicates a tendency for the nation's interest rate to rise to *i*=6.25%. However, because of perfect capital mobility at *i*=5.0% for this small nation, there is a capital inflow from abroad that increases the nation's money supply as the foreign currency is exchanged for domestic currency and shifts the *LM* curve to *LM'*. As a result, broken curves *IS'* and *LM'* intersect at point *F* on the horizontal *BP* curve, with *i* = 5.0% and *Yf* = 1500, and the nation is simultaneously in internal and external balance. In this case, it will be impossible for the small nation to prevent its money supply from increasing until the *LM* curve has shifted all the way to *LM'.* Only then will capital inflows come to an end and the nation's money supply stabilize (at the level given by LM').

If this small nation attempted to reach point *F* by the easy monetary policy that shifts the *LM* curve to the right to *LM'*, the interest rate would tend to fall to *i*=3.75% (point E"). This would lead to capital outflows, which would reduce the nation's money supply to the original level and shift the *LM'* curve back to the original *LM* position.

If the nation attempted to sterilize, or neutralize, the effect of these capital outflows on its money supply, it would soon exhaust all of its foreign exchange reserves, and the capital outflows would continue until the nation's money supply had been reduced to the original position given by the LM curve.

Thus, with fixed exchange rates, monetary policy is completely ineffective if international capital flows are highly elastic, as they are likely to be, for many small industrial nations in today's world of highly integrated capital markets.

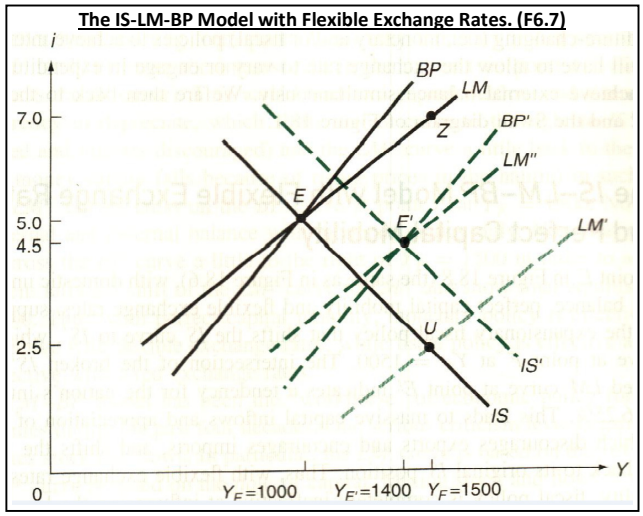
6.5 THE IS-LM-BP MODEL WITH FLEXIBLE EXCHANGE RATES (18.5)

Somewhat different outcomes result under flexible exchange rates since, per definition, the exchange rate is now allowed to adapt to changing circumstances.

6.5A The IS-LM-BP model with flexible exchange rates and imperfect capital mobility (18.5a)

- All three markets are in equilibrium with external balance and unemployment at *E*.
- Easy monetary policy shifts the *LM* curve right to *LM'* to intersect the *IS* curve at point *U*, *Y*f=1500 and *i* = 2.5%.
- Since point *U* is to the right of the *BP* curve, the nation has an external deficit as *Y* is higher and *i* is lower than at point *E*.
- Under a flexible exchange rate system, the **nation's currency depreciates** and the ***BP* curve shifts to the right**.
- At the same time, the **depreciation improves the nation's trade balance** (if the Marshall-Lerner condition is satisfied), and so the *IS* curve shifts to the right.
- The depreciation will also increase domestic prices and the transaction demand for money and shift the *LM'* curve to the left (as the real money supply declines as a result of rising domestic prices).
- Equilibrium will be reestablished in all three markets where curves I*S'* and *LM''* intersect on the *BP'* curve at a point such as *E'*, with Y=1400 and i=4.5%.

The IS-LM-BP Model with Flexible Exchange Rates. (F6.7)



The process can be repeated with additional doses of easy monetary policy until all three markets are in equilibrium at the full employment level of national income of Yf=1500. **With flexible exchange rates, equilibrium in all three markets will always be on the BP curve, but now the BP curve also will shift.**

1. In order to reach the full-employment level of national income from point E, the nation uses the **expansionary fiscal policy** that shifts the IS curve to the right so as to cross the LM curve at point Z.
2. Since point Z is to the right of the BP curve, the nation will have **a deficit in its balance of payments**.
3. With flexible exchange rates, the nation's **currency depreciates and the BP curve shifts to the right**.
4. This induces a rightward shift in the IS curve and a leftward shift in the LM curve, until the IS and LM curves intersect on the BP curve and all three markets are simultaneously in equilibrium.
5. The nation may need to apply **additional doses of expansionary fiscal policy** to reach the full-employment level of national income of YF = 1500.

If the BP curve had been to the right of point Z to begin with, the nation's currency would appreciate and this would cause opposite shifts in the BP, IS, and LM curves until all three markets are simultaneously in equilibrium at the full-employment level of national income.

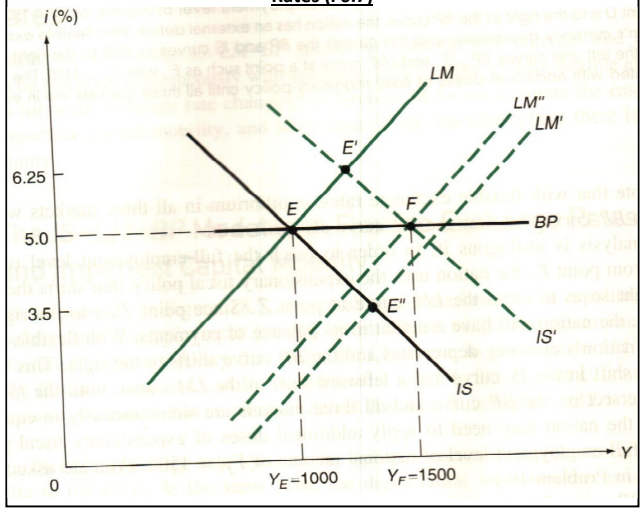
Note, however, that in either case (i.e., whether the BP curve is steeper or flatter than the LM curve) when a nation starts with an easy monetary policy rather than with an expansionary fiscal policy, it ends up with a lower interest rate, which is a stimulus to long-run growth. What is important is that by using monetary and/or fiscal policies to achieve internal balance, the nation will have to allow the exchange rate to vary or engage in expenditure-switching policies to achieve external balance simultaneously.

6.5B THE IS-LM-BP MODEL WITH FLEXIBLE EXCHANGE RATES AND PERFECT CAPITAL MOBILITY (18.5b)

- Starting at point E with domestic unemployment and external balance, perfect capital mobility and flexible exchange rates
- The nation uses the expansionary fiscal policy that **shifts the *IS* curve to *IS'***, which intersects the BP curve at point F at YF — 1500.
- The intersection of the broken *IS'* curve with the unchanged *LM* curve at point *E'* indicates a tendency for the nation's interest rate to rise to *i*=6.25%.
- This leads to massive capital inflows and appreciation of the nation's currency,
- Which discourages exports and encourages imports, and **shifts the IS' curve to the left and back to its original IS position**.

Thus, with flexible exchange rates and perfect capital mobility, fiscal policy is completely ineffective at influencing the level of nations, income.

Adjustment Policies with Perfect Capital Flows and Flexible Exchange Rates (F6.7)



On the other hand;

- Starting from point E, an easy monetary policy that **shifts the *LM* curve to *LM'*** tends to lower the interest rate in the nation at point E" where the LM' curve intersects the IS curve.
- This leads to a capital outflow and a tendency of the nation's currency to depreciate, which
  - shifts **the *IS* curve to the right to *IS'*** (as exports are stimulated and imports discouraged) and
  - the ***LM'* curve a little back to the left to *LM*"** as the real money supply falls because of rising prices in the nation in such a way that the IS' and LM" curves cross on the *BP* curve at point *F* at *YF*=1500.
- Now the nation achieves internal and external balance with monetary policy only. Note that we made the LM' curve cross the *BP* curve a little to the right of *YF*=1500 in order to accommodate the subsequent leftward shift of the *LM*' curve to *LM*" and show final equilibrium point *F* at *Yf*=1500.

Thus, with perfect capital mobility, monetary policy is effective and **fiscal policy ineffective with flexible exchange rates, while fiscal policy is effective** and **monetary policy ineffective with fixed exchange rates.**

One serious criticism levied against the model is that it **mixes stock and flows**. The LM curve is based on the **stock of money**, while the BP curve is based on the **flow of capital**. Mixing stock and flows is never a good idea. The model assumes that a rise in domestic interest rates will lead to a continuous capital inflow from abroad to finance the nation's balance-of-payments deficit. The capital inflow, however, is likely to be of a once-and-for-all type and to come to an end after investors have readjusted their portfolios following the increase in the domestic interest rate.

6.7 DIRECT CONTROLS (18.7)

Direct controls to affect the nation's balance of payments can be subdivided into **trade controls** such as tariffs, quotas, and other quantitative restrictions on the flow of international trade or **financial or exchange controls** such as restrictions on international capital flows and multiple exchange rates, and others. In general, trade controls are both less important and less acceptable than exchange controls. Direct control can also take the form of **price and wage controls** in an attempt to restrain domestic inflation when more general policies have failed.

6.7A TRADE CONTROLS (18.7a)

One of the most important trade or **commercial controls** is the

- **Import tariff -** which increases the price of imported goods to domestic consumers and **stimulates the domestic production of import substitutes**.
- **Export subsidies -** make domestic goods cheaper to foreigners and encourage the nation's exports.

An import tariff and an export subsidy of a **given percentage applied across the board** on all commodities are equivalent to a devaluation of the nation's currency by the same percentage but are usually applied to specific items rather than across the board.

An **import tariff is equivalent to an import quota**. Both are expenditure-switching policies, like devaluation, and both stimulate domestic production. In general, nations today are not allowed to impose new import tariffs and quotas except temporarily, when in serious balance-of-payments difficulties.

- Advance deposits - Frequently applied today by developing nations. The requirement that the importer make an advance deposit at a commercial bank of a sum equal to the value or a fraction of the value of the goods he wishes to import, for a period of time of varying duration and at do interest. This has the effect of increasing the price of imports by the **interest foregone** on the sum deposited with the commercial bank, and it also discourages imports. Advance deposits are thus flexible devices, but they can be difficult and costly to administer.
- A deficit nation may also impose **restrictions on foreign travel and tourist expenditures** abroad.

6.7B EXCHANGE CONTROLS (18.b)

- Turning to **financial controls**, we find that developed nations sometimes impose restrictions on capital exports when in balance-of-payments deficit and on capital imports when in surplus.
- **Multiple exchange rates -** Implimenting higher exchange rates on luxury and nonessential imports and lower rates on essential imports. Used by most developing nations. The higher exchange rate on luxuries and nonessentials makes these foreign products more expensive to domestic buyers and discourages their importation, while the lower exchange rate on essential imports makes these products cheaper to domestic users and encourages their importation.
- **Intervention -** For an effective control of foreign exchange rates and foreign exchange market the government should have a central authority—the central bank—which should have complete power to control and regulate foreign exchange market. This takes the form of **"pegging-up"** or **"pegging down"** the currency of the country to a chosen rate of exchange.
- **Restriction -** Exchange restriction refers to the policy by which the Government restricts the supply of its currency coming into the exchange market. Restriction may be of three types.
    1. **Centralize all trading in foreign exchange** with one authority, normally the central bank of the country.
    2. **Permission of the Government** needed to exchange of national currency against foreign currency.
    3. Make all foreign exchange transactions **through the agency of the Government**.
- **Exchange Clearing Agreements -** Two countries engaged in trade pay to their respective central banks the amounts payable to their respective foreign creditors. The central banks then use the money in offsetting the corresponding claims after fixing the value of the currencies by common agreement. As that happens is a notification by one central bank to another that a certain payment has been received or made. This, however, encourages black markets, transfer pricing and corruption.

STUDY UNIT 7 - PRICES AND OUTPUT IN AN OPEN ECONOMY: AGGREGATE DEMAND AND AGGREGATE SUPPLY

7.1 INTRODUCTION (19.1)

We now relax the assumption of constant prices and examine the **relationship between price and output in an open economy** by using an AD and AS framework that incorporates the **effects of international trade and capital flows**. We define the AD and AS curve and show how it is derived from the IS and LM curves

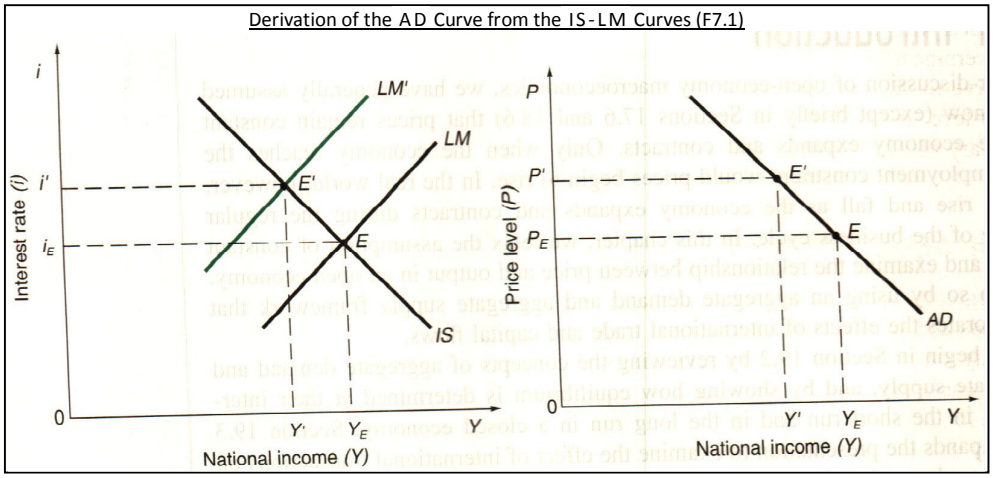
7.2 AGGREGATE DEMAND, AGGREGATE SUPPLY AND EQUILIBRIUM IN A CLOSED ECONOMY (19.2) – READ ONLY!

7.2A Aggregate Demand in a Closed Economy (19.2a)

The **aggregate demand (AD) curve** shows the relationship between the **total quantity demanded of goods and services** in an economy and the general price level, while holding constant the nation's supply of money, government expenditures, and taxes. The aggregate demand curve is **downward sloping.**

The intersection of the IS and LM curves at a given price level determines the equilibrium interest rate (iE) and national income (YE) at point E in the left panel. This defines point E at price PE and income YE on aggregate demand curve AD in the right panel. An increase in price from PE to P' reduces the real value of the nation's given money supply and causes the LM curve to shift to the left to LM', thus resulting in the lower income level of Y' at point F in the left panel and on the AD curve in the right panel.

Derivation of the AD Curve from the IS-LM Curves (F7.1)

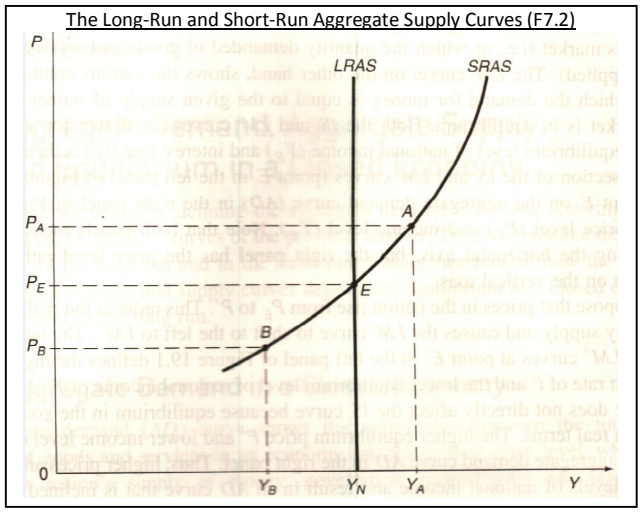


7.2B AGGREGATE SUPPLY IN THE LONG RUN AND IN THE SHORT RUN (19.2b)

The **aggregate supply (AS) curve** shows the relationship between the **total quantity supplied of goods and services** in an economy and the general price level. This relationship depends crucially on the time. Thus, we have a long-run aggregate supply curve and a short-run aggregate supply curve.

- The **long-run aggregate supply (LRAS)** curve does not depend on prices but only on the quantity of **labor, capital, natural resources, and technology**. The quantity of inputs available to an economy determines the natural level of output (YN). It is vertical at YN
- The **short-run aggregate supply (SRAS**) curve, on the other hand, slopes upward, indicating that higher prices lead to larger outputs in the short run. It slopes upward, indicating that the nation's output can temporarily exceed (point A) or fall short (point B) of its natural level (point E) because of imperfect information or market imperfections.

The Long-Run and Short-Run Aggregate Supply Curves (F7.2)

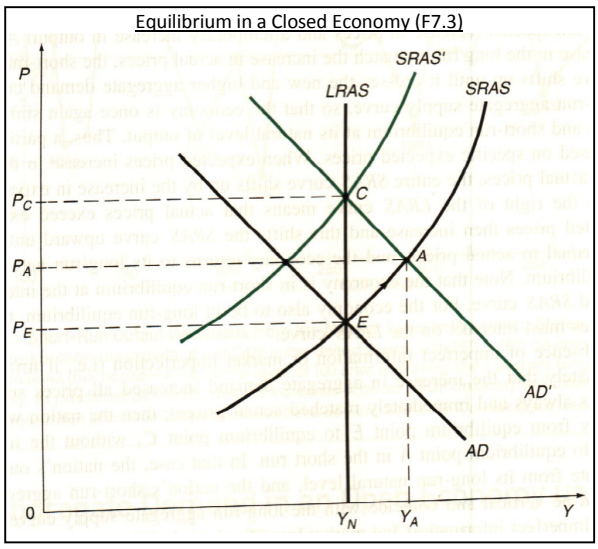


7.3C SHORT-RUN AND LONG-RUN EQUILIBRIUM IN A CLOSED ECONOMY (19.2C)

Given the aggregate demand curve and the short-run and long-run aggregate supply curves, we can examine the short-run and the long-run equilibrium in a closed economy. We begin at equilibrium point E at the intersection of aggregate demand curve

At the intersection of the AD, LRAS, and SRAS curves at point E, the nation is simultaneously in long-run and short-run equilibrium. An unexpected increase in AD to AD' defines the new short-run equilibrium point A at the intersection of AD' and SRAS curves at PA and YA. YA exceeds the natural level of output of YN.
In the long run, as expected prices increase and match actual prices, the SRAS curve shifts up to SRAS' and defines the new long-run equilibrium point C at the intersection of AD', LRAS, and SRAS' curves at Pc and YN.

Equilibrium in a Closed Economy (F7.3)



7.3 AGGREGATE DEMAND IN AN OPEN ECONOMY UNDER FIXED AND FLEXIBLE EXCHANGE RATES (19.3)

The primary effect of introducing international transactions on the AD-AS model is on aggregate demand. Opening the economy affects primarily aggregate demand in the short and medium runs. The effect of international transactions on AD will be different, depending upon the exchange rate system.

7.3A AGGREGATE DEMAND IN AN OPEN ECONOMY UNDER FIXED EXCHANGE RATES (19.3a)

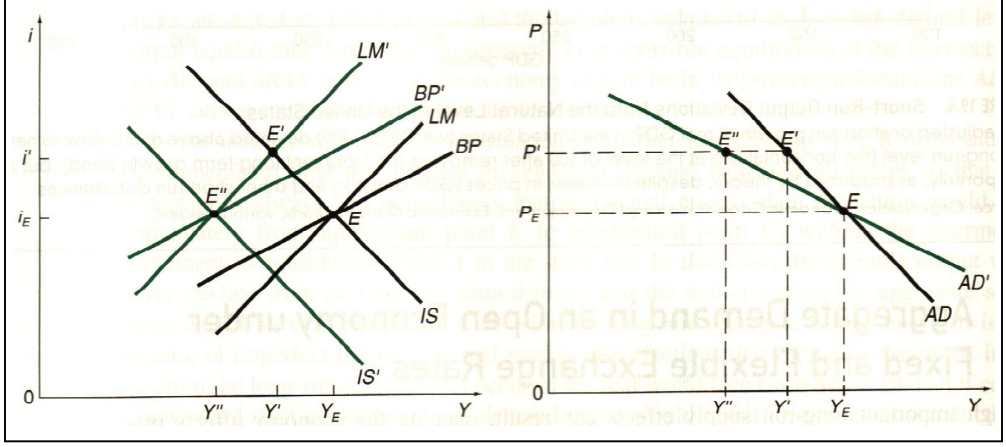
Figure 7.4 shows an open economy's aggregate demand curve under fixed exchange rates and compares it to the aggregate demand curve derived (F7.1) for the closed economy.

- The left panel shows original equilibrium point E in the goods and money markets. This gives point E in the right panel.
- Suppose that prices rise from PE to P'. This reduces the real value of the money supply and causes the LM curve to shift to the left to LM' exactly as in the closed-economy case.

With the economy now open, there is an additional international effect that must be considered.

- That is, the increase in domestic prices from PE to P' also reduces the nation's exports and increases the nation's imports and causes the IS and the BP curves also to shift to the left to IS' and BP'.
- The IS curve shifts to the left because of the worsened trade balance.
- The BP curve shifts to the left because higher interest rates are now required at each level of income to attract sufficient additional capital from abroad to compensate for the worsened trade balance that results from the increase in domestic prices.

Derivation of a Nation's Aggregate Demand Curve under Fixed Exchange Rates (F7.4)



The intersection of the LM', BP', and IS' curves in the left panel determines new equilibrium point E". At point E", the interest rate (iE) happens to be the same as at the original equilibrium point E before the increase in prices in the nation, but prices are higher (P' instead of PE), and the level of national income is lower (Y" instead of YE). This gives point E" in the right panel. Joining points E and E" in the right panel gives demand curve AD' for this open economy.

Note that:

- **AD' is flatter or more elastic** than closed-economy aggregate demand because when the economy is open we have the additional effect resulting from **international trade and international capital flows**.
- The **more responsive exports and imports** are to the change in domestic prices, the **more elastic the AD' curve** is in relation to the AD curve (assuming that the Marshall-Lerner condition is satisfied).

How do we know that the LM' and IS' curves intersect exactly on the BP' curve (as at point E" in the left panel) so that the nation would be once again simultaneously in equilibrium in all three markets?

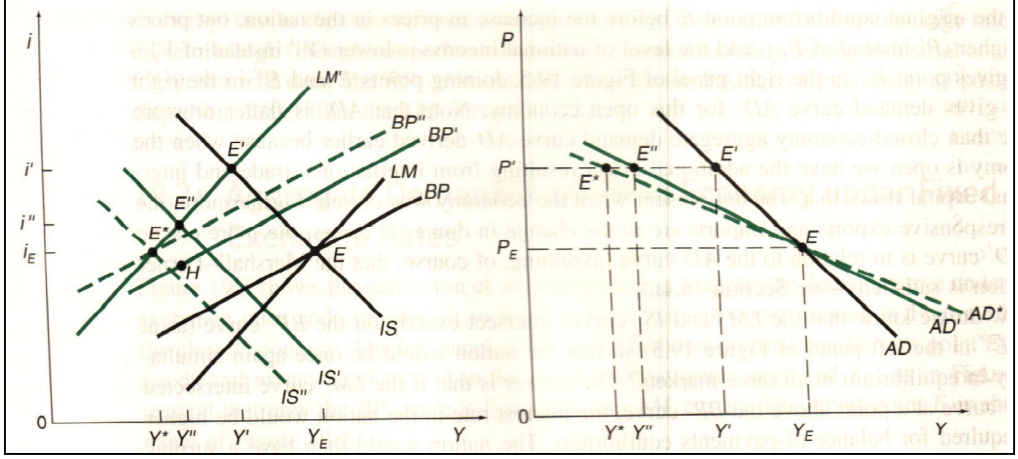
- If the LM' curve intersected the IS' curve at a point above the BP' curve, the interest rate in the nation would be higher than required for balance-of-payments equilibrium. The nation would then have a **surplus in the balance of payments**.
- Under a fixed exchange rate system, the surplus in the nation's balance of payments would result in an inflow of international reserves and thus an increase in the nation's money supply, which would shift the LM' down sufficiently to intersect the IS' curve on the BP' curve, so that the nation would be simultaneously in equilibrium in the goods and money markets and in the balance of payments, as at point E". The opposite would occur if the LM' and IS' curves crossed below the BP' curve.

7.3B AGGREGATE DEMAND IN AN OPEN ECONOMY UNDER FLEXIBLE EXCHANGE RATES (19.3b)

The AD curve in this instance is, in turn, flatter (more elastic) than that under fixed exchange rates.

- Starting from equilibrium point E in the left and right panels
- **Prices rise** from PE to P'. This reduces the **real value of the given money supply** and causes the LM curve to shift to the left to LM'.
- The increase in domestic prices **reduces the exports and increases imports** causing IS and BP curves to shift left to IS' and BP'.
- Now the LM' and IS' curves cross at point E", which is **above the BP' curve** (point H). This means that the nation has a **surplus in its balance of payments**.
- With flexible exchange rates, instead of the nation's money supply increasing and shifting the LM curve to the right (as in the case of fixed exchange rates), the **nation's currency appreciates** so that the BP' curve shifts to the left again to BP".
- This **causes a further deterioration in the nation's trade balance** and a **further shift** of the nation's IS' curve to IS" until the LM' and IS" curves intersect on the BP" curve at point E*, the nation is once again simultaneously in equilibrium in the goods and services and money markets and in the balance of payments.
- This gives point E* in the right panel. Joining points E and E* in the right panel gives aggregate demand curve AD*, which is **flatter or more elastic** than either AD or AD'.

Derivation of the Nation's Aggregate Demand Curve under Flexible Exchange Rates. (F7.5)



If the LM' and IS'" curves intersected below the BP' curve rather than above it as in the left panel (i.e., if point E* had been below point H), then the nation would have a deficit in its balance of payments. In that case, the nation's currency would depreciate (i.e., the BP' curve would shift to the right and so would the IS' curve) until the LM' and IS" curves intersected on the BP" curve and the nation was in equilibrium in all three markets. If the LM' and IS' curves intersected on the BP' curve, there would be no change in the nation's exchange rate and no further shift in the BP' and IS' curves, so that the result would be the same as under fixed exchange rates.

7.4 THE EFFECT OF ECONOMIC SHOCKS AND MACROECONOMIC POLICIES ON AGGREGATE DEMAND IN OPEN ECONOMIES WITH FLEXIBLE PRICES (19.4)

7.4A REAL-SECTOR SHOCKS AND AGGREGATE DEMAND (19.4a)

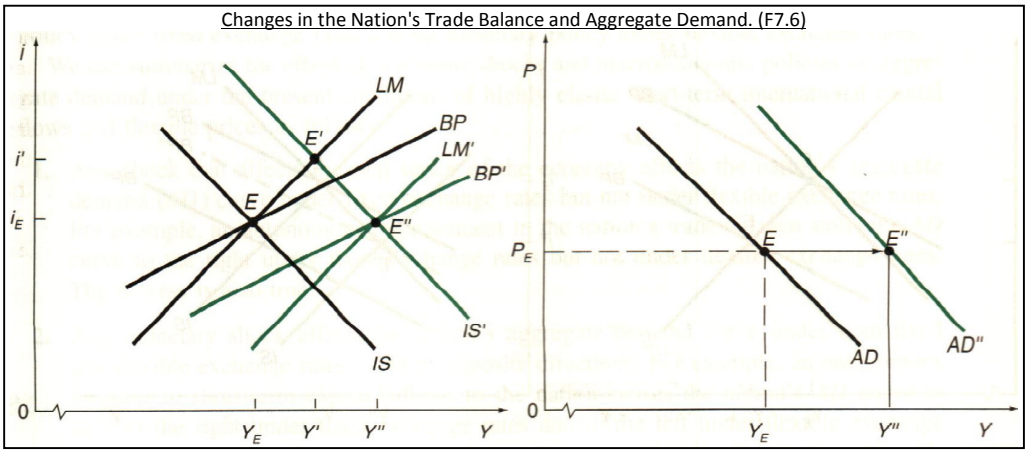
Under Fixed Exchange Rates

- Starting from equilibrium point E in both panels
- The nation's exports increase or the nation's imports decrease due to an increase in foreign prices or a change in tastes.
- With **constant domestic prices** this leads to an improvement in the nation's trade balance and causes the nation's IS and BP curves to **shift to the right to IS' and BP'.**
- The **intersection of the IS' and LM curves at point E' is above the BP'** curve, the nation has a **surplus in its BOP.**
- Under fixed exchange rates, this leads to an inflow of international reserves and an increase in the nation's money supply, which causes a **rightward shift in the LM curve to LM',** thus defining new equilibrium point E".
- The movement from point E to point E" in the left panel is shown by the shift in the nation's aggregate demand curve from AD to AD" in the right panel. That is, at the given domestic price of PE, the nation's output is now Y" instead of Y because of the **autonomous increase in the nation's exports or reduction in the nation's imports.**

Under flexible exchange rates.

- the potential **surplus in the nation's balance of payments** resulting at point E' in the left panel **leads to an appreciation of the currency** and a leftward shift of the BP' curve back to its **original position of BP.**
- The appreciation accompanied by a **leftward shift in the IS' curve back to its original IS position** as the trade balance returns to its original level as a result of the appreciation of the nation's currency.
- Thus, an **autonomous improvement in the nation's trade balance has no lasting effect** on the nation's level of output and aggregate demand (i.e., the nation returns to equilibrium point E in the left panel and point E on aggregate demand curve AD in the right panel) under flexible exchange rates.
- An autonomous worsening of the nation's trade balance would have the opposite effect.

Changes in the Nation's Trade Balance and Aggregate Demand. (F7.6)



7.4B MONETARY SHOCKS AND AGGREGATE DEMAND (19.4b)

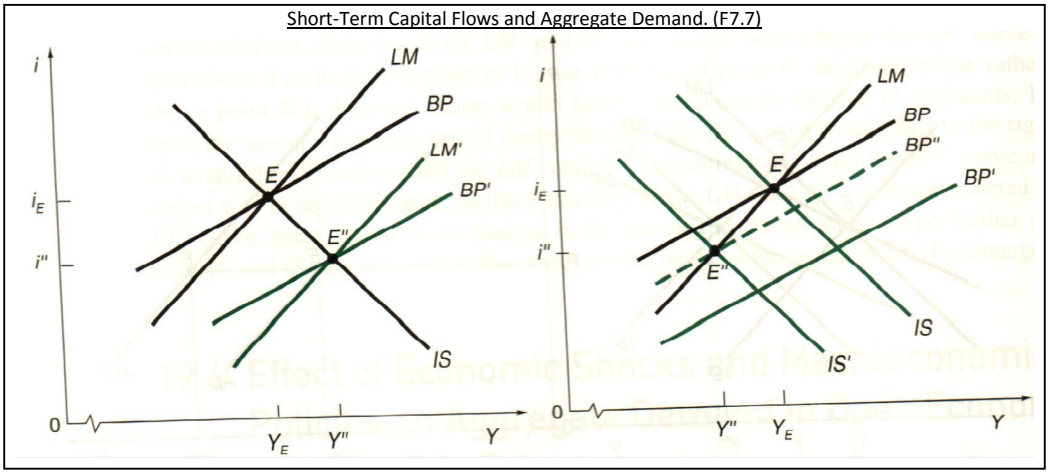
Under Fixed Exchange Rates

- Starting from equilibrium point E in, suppose that there is a **short-term capital inflow** to or **reduced capital outflow** as a result of **a reduction in interest rates abroad** or a change in tastes at home or abroad.
- This leads to a **rightward shift of the BP curve to BP in both panels**.
- With fixed exchange rates, the fact that **point E is above the BP'** curve means that the nation has a **surplus in its BOP.**
- This leads to an **inflow of international reserves** and an increase in the nation's money supply, which cause the nation's **LM curve to shift to the right to LM'**, thus defining new equilibrium point E" at higher income Y". S
- Since domestic prices are unchanged at the higher level of national income, this means that the **nation's aggregate demand curve (not shown in the figure) shifts to the right.**

Under flexible exchange rates.

- The **rightward shift in the BP curve to BP' leads** to a potential surplus in the nation's balance of payments (the right panel).
- This causes the **nation's currency to appreciate** so that the **nation's trade balance worsens**. These changes are shown by a **leftward shift of the BP and IS curves to BP" and IS'** until new equilibrium point E" is reached,
- At which the LM. BP", and IS' curves intersect at the given price level and lower national income of Y.
- As a result, the **nation's aggregate demand curve (not shown in the figure) shifts to the left**.
- Thus, a **short-term capital inflow leads** to a **rightward shift of the nation's aggregate demand** curve under fixed exchange rates but a leftward shift under flexible rates. The exact opposite occurs with an autonomous short-term capital outflow from the nation.

Short-Term Capital Flows and Aggregate Demand. (F7.7)



7.4C FISCAL AND MONETARY POLICIES AND AGGREGATE DEMAND IN OPEN ECONOMIES (19.4c)

- **Under highly elastic short-term international capital flows** (with the BP curve flatter than the LM curve) fiscal policy is effective while monetary policy is not, whereas the opposite is the case under flexible rates.
- Under **fixed exchange rates and highly elastic short-term international capital flows**, expansionary fiscal policy will lead to capital inflows and is very effective in shifting the nation's aggregate demand curve to the right.
- **Contractionary fiscal policy will lead to capital outflows** and is very effective in shifting the nation's aggregate demand curve to the left.
- **Under fixed exchange rates and high international capital flows**, monetary policy is not effective because any attempt by the nation to lower interest rates by increasing the nation's money supply (easy monetary policy) will simply lead to a capital outflow with little if any effect on the nation's aggregate demand.
- **Under flexible exchange rates and high international short-term capital flows**, the opposite is the case. That is, easy monetary policy will be very effective in shifting the nation's aggregate demand curve to the right, and tight monetary policy will be effective in shifting the nation's demand curve to the left.
- **Fiscal policy will be ineffective since short-term international capital** flows will offset much of the effect of any fiscal policy.

Thus, in examining the effect of macroeconomic policies in open economies with flexible prices and highly elastic short-term international capital flows, we will concentrate on **fiscal policy under fixed exchange rates and on monetary policy under flexible exchange rates.**

We can summarize the effect of economic **shocks and macroeconomic policies** on aggregate demand under the present conditions of highly elastic short-term international capital flows and flexible prices as follows:

1. Any shock that affects the **real sector of the economy affects the nation's aggregate demand (AD) curve** under fixed exchange rates but not under flexible exchange rates. For example, an autonomous improvement in the nation's trade balance shifts the AD curve to the right under fixed exchange rates but not under flexible exchange rates. The reverse is also true.
2. Any **monetary shock affects the nation's aggregate demand curve under both fixed and flexible exchange rates**—but in opposite directions. For example, an autonomous increase in short-term capital inflows to the nation causes the nation's AD curve to shift to the right under fixed exchange rates and to the left under flexible exchange rates. The reverse is also true.
3. **Fiscal policy is effective under fixed exchange rates but not under flexible exchange rates**. The opposite is true for monetary policy. For example, expansionary fiscal policy—but not monetary policy—can be used to shift the AD curve to the right under fixed exchange rates, but monetary policy—not fiscal policy—can be used to shift the nation's AD curve to the right under flexible exchange rates.

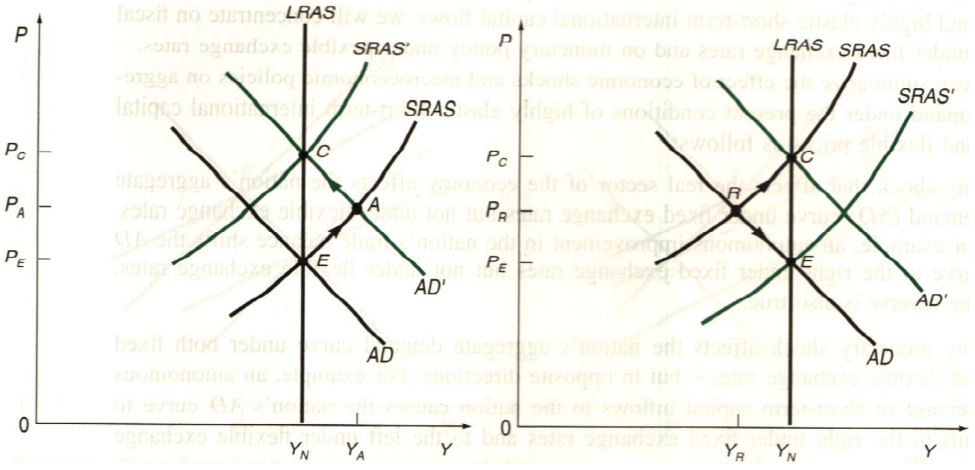
7.5 THE EFFECT OF FISCAL AND MONETARY POLICIES IN OPEN ECONOMIES WITH FLEXIBLE PRICES (19.5)

Under fixed exchange rates and highly elastic short-term international capital flows, fiscal policy is effective whereas monetary policy is ineffective whereas with flexible exchange rates, monetary policy is effective and fiscal policy is not. Thus, we examine here **fiscal policy under fixed exchange rates** and **monetary policy under flexible rates**.

- The effect of expansionary fiscal policy **under fixed exchange rates** from initial equilibrium point E, where the AD and SRAS curves cross on the LRAS curve at the nation's natural level of output of YN and price level of PE in the left panel.
- An **expansionary fiscal policy that shifts the AD curve up to AD'** defines new short-run equilibrium point A at the intersection of the AD' and SRAS curves at PA and YA, with YA exceeding YN.
- The temporary expansion of output to YA occurs because of **market imperfections** or **imperfect information** for a closed economy. That occurs because firms originally believe that only the price of the products they sell has increased and actual prices temporarily exceed expected prices.
- Over time, **firms realize that all prices (including their costs of production) have increased**, the SRAS curve will shift up to SRAS'. The intersection of the AD' and the SRAS' curves on the LRAS curve defines new long-run equilibrium point C at the higher price of PC and natural level of output of YN.
- The price level is now higher, but the level of output has returned to its lower long-run natural level. The short-run increase in output is entirely eliminated in the long run as expected prices rise to match the increase in actual prices.

Note that this is exactly the same as in the closed-economy case. The only difference is we now have an open economy.

Expansionary Fiscal Policy from the Natural Level of Output and Recession under Fixed Exchange Rates. (F7.8)



The effect of monetary policy under flexible exchange rates is qualitatively the same as the effect of fiscal policy under fixed exchange rates.

- Once we have incorporated into the nation's aggregate demand curve the different adjustment taking place under flexible exchange rates rather than under fixed exchange rates.
- That is, starting from a position of long-run equilibrium, an **easy monetary policy shifts the ad curve to the right**, and this leads to a **temporary expansion of the nation's output**.
- In the **long run**, however, as expected prices rise to match the increase in actual prices, the **SRAS curve shifts up and defines a new equilibrium point** at the natural level of output but higher prices.

With flexible exchange rates, **the nation's currency will also have depreciated**.

- Similarly, **starting from a position of recession**, **monetary policy can speed the movement** to the higher natural level of output but only at the expense of higher prices.
- The alternative is for the **economy to allow the recession to be corrected automatically** by market forces. In that case, the **nation would end up with lower prices** and an appreciated currency.
- The problem, however, is that if prices are sticky **and not too flexible downward**, then the **process may take too long**. In that case, the **cost of inflation from easy monetary policy may be lower** than the large **opportunity cost of lost output and employment** from a protracted recession.

7.6 MACROECONOMIC POLICIES TO STIMULATE GROWTH AND ADJUST TO SUPPLY SHOCKS (19.6)

We examine fiscal and monetary policies to stimulate long-run growth and adjust to supply shocks in open economies with flexible prices.

7.6A MACROECONOMIC POLICIES FOR GROWTH (19.6a)

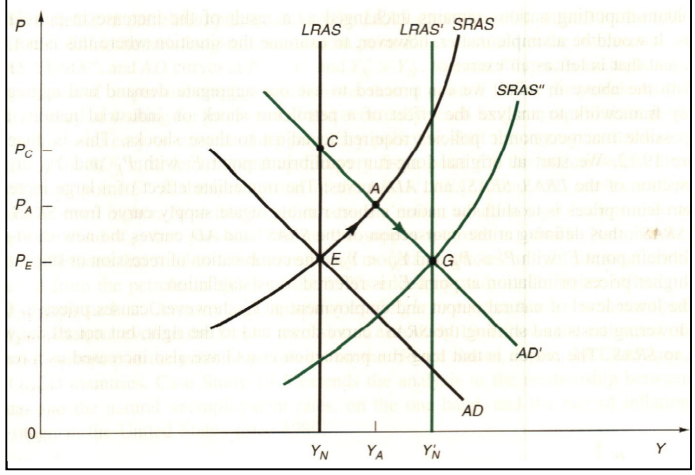
Although fiscal and monetary policies are used primarily to affect aggregate demand in the short and medium runs, they can also be used to stimulate long-run growth in the economy (shift the LRAS curve to the right).

- Governments can **stimulate long-run growth by increasing expenditures** on education, infrastructures, basic research, and to **improve the functioning of markets**.
- Governments can also **stimulate long-run growth by tax incentives** and **low long-term interest rates** to encourage private investment.
- The process of long-run growth is not yet entirely understood. To the extent that efforts to stimulate long-run growth in the economy are successful, however, they will shift the nation's LRAS curve to the right, leading to more employment, higher incomes, lower prices, and possibly an appreciated currency in the long run.

The use of **expansionary macroeconomic (fiscal and monetary) policies to stimulate growth** can be examined.

- We begin at **long-run equilibrium point E** where the nation's AD and SRAS curves intersect on the LRAS curve at PE and YN.
- Suppose the nation uses expansionary fiscal and/or monetary policies to **stimulate long-run growth**.
- The AD curve then shifts to the right to AD', so that the nation reaches new short-run equilibrium point A at PA and YA > YN.
- To the extent that the expansionary macroeconomic policies do in fact stimulate long-run growth, however**, the LRAS and SRAS curves shift to the right to LRAS' and SRAS"** and define new **long-run equilibrium point G** at PG (= PE) and Y'N > YN at the intersection of the LRAS', SRAS", and AD' curves.
- Growth has led to a hig**her level of natural output and no increase in prices** in relation to original equilibrium point E.

Macroeconomic Policies for Long-Run Growth (F7.9)



Thus, instead of expansionary macroeconomic policy leading to an upward shift in the SRAS curve and the same original level of natural output and much higher prices in the long run in the absence of growth (point C), with growth, the nation reaches a **higher level of natural output and no long-run increase in prices.**

With growth, however, prices could be higher or lower as compared with the original long-run equilibrium level. It all depends on how far to the right the LRAS and SRAS curves shift in relation to the AD curve as a result of expansionary macroeconomic policies aimed at growth.

The greater is the rightward shift in the LRAS and SRAS curves in relation to the AD curve, the greater is the increase in the natural level of output in the nation and the more likely it is that prices will be lower in the long run.

7.6B MACROECONOMIC POLICIES TO ADJUST TO SUPPLY SHOCKS (19.6b)

Macroeconomic policies can also be used to adjust to supply shocks. The most notorious of supply shock was the increase in petroleum prices by OPEC (Organization of Petroleum Exporting Countries) between 1973 and 1974, and from 1979 to 1981.

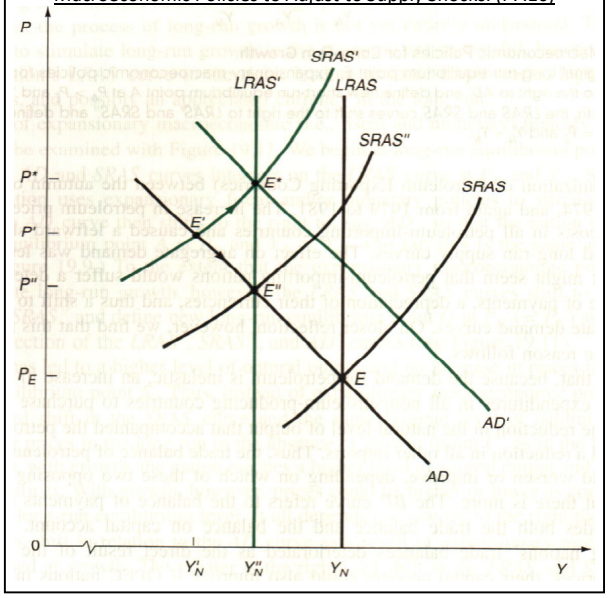
- The increase in petroleum prices **increased production costs** in all petroleum-importing countries and caused a **leftward shift in their short-run and long-run supply curves**.
- The effect on **aggregate demand was less clear**. Petroleum-importing nations would suffer a deterioration of their balance of payments, a depreciation of their currencies, and thus a shift to the right in their aggregate demand curves. However, this need not be the case. The reason follows**:**
    - Because the demand for **petroleum is inelastic**, an increase in price led to higher total expenditures in all nonpetroleum-producing countries.
    - But the reduction in the natural level of output that accompanied the petroleum shock also induced a reduction in all other imports. Thus, the trade balance of petroleum-importing nations could worsen or improve, depending on which of these two opposing forces was stronger. But there is more;
    - The BP curve refers to the balance of payments as a whole, which includes both the trade balance and the balance on capital account. Thus, even if importing nations' trade balances deteriorated as the direct result of the increase in petroleum prices, their capital account could also improve if OPEC nations invested their higher petroleum earnings in industrial nations.
    - This is in fact exactly what happened with the United States. Therefore, no general conclusion can be reached.

In what follows, therefore, we assume that the aggregate demand curve of petroleum-importing nations remains unchanged as a result of the increase in petroleum prices.

With the above in mind, we can proceed to use our aggregate demand and aggregate supply framework to analyze the effect of a petroleum shock on industrial nations and the possible macroeconomic policies required to adjust to these shocks.

- We start at original long-run equilibrium point E with PE and YN at the intersection of the LRAS, SRAS, and AD curves.
- The immediate effect of a large increase in petroleum prices is to shift the nation's **short-run aggregate supply curve from SRAS to, say, SRAS',** thus defining at the intersection of the SRAS' and AD curves the new short-run equilibrium point E' with P' > PE and < YN.
- The **combination of recession and inflation** at point E' is referred to as **stagflation.**
- The lower **level of natural output and employment** at Y'N, however, causes prices to fall, thus lowering costs and shifting the SRAS' curve down and to the right, but not all the way back to SRAS. The reason is that long-run production costs have increased from the **increase in petroleum prices**, and so the LRAS curve has shifted to the left, to LRAS'.
- Thus, the new long-run equilibrium point E" is obtained at the intersection of the LRAS', SRAS", and AD curves at P" < P' and Y''N > Y'N.
- At point E", **prices are higher** and the **natural level of output and employment is lower** than at point E before the petroleum shock.
- Instead of waiting for prices to fall and eventually reach long-run equilibrium point E", the nation used **expansionary monetary policy** to shift the aggregate demand curve from AD to AD' to speed up recovery from point E', **the nation would move to equilibrium point E*** at the intersection of the LRAS', SRAS', and AD' curves, and prices would be even higher.

Macroeconomic Policies to Adjust to Supply Shocks. (F7.10)



Note that in either case the nation **would not get back to the natural output level of YN** that prevailed before the supply (petroleum) shock.

Nations such as Italy and France that tried to use expansionary monetary policies to fight the stagflation that resulted from the petroleum shock of the 1970s ended up with much higher inflation rates than nations such as Germany and Japan that used tight or contractionary monetary policies to fight inflation, even in the face of recession.

STUDY UNIT 8 - FLEXIBLE VERSUS FIXED EXCHANGE RATES, THE EUROPEAN MONETARY SYSTEM AND MACROECONOMIC POLICY COORDINATION (20)

8.1 INTRODUCTION (20.1)

Advocates of **flexible exchange rates** argue that it is more efficient than a system to correct balance-of-payments disequilibria. They stress that by allowing a nation to **achieve external balance easily and automatically**, flexible rates facilitate the achievement of internal balance and other economic objectives of the nation.
Advocates of **fixed exchange rates** argue that by introducing a degree of uncertainty not present under fixed rates, flexible exchange rates reduce the volume of international trade and investment, are more likely to lead to destabilizing speculation, and are inflationary.
The balance today seems to be toward **fixed or more managed rates**,

- Economists often compare the obvious weaknesses of whatever the prevailing exchange rate system is used.t
- This is contrasted to the more or less consistent preference of businesspeople, bankers, and government officials for fixed rates, or at least greatly restrained fluctuations.

8.2 THE CASE FOR FLEXIBLE EXCHANGE RATES (20.2)

Under a truly **flexible exchange rate system**, a deficit or surplus in the nation's balance of payments is automatically corrected by a depreciation or an appreciation of the nation's currency respectively, without any government intervention.
Pegging or fixing the exchange rate at one level, usually results in excess demand for or excess supply of foreign exchange (a deficit or a surplus in the BOP). This is inefficient, may lead to policy mistakes.

8.2A MARKET EFFICIENCY (20.2a)

Advantages of a flexible exchange rate system are:

- Corrects balance- of-payments disequilibria smoothly and continuously as they occur. This results in stabilizing speculation, which dampens fluctuations in exchange rates. Whatever fluctuations remain in exchange rates can then be hedged at a small cost.
- clearly identify the degree of comparative advantage and disadvantage of the nation in various commodities when these equilibrium exchange rates are translated into domestic prices

Disadvantages of a fixed exchange rate system are:

- the inability or unwillingness of a nation to adjust the exchange rate when out of equilibrium is likely to give rise to destabilizing speculation and eventually force the nation to make a large discrete change in its exchange rate. This jolts the economy, imposes serious adjustment costs on the nation, and interferes with the flow of international trade
- Fixed exchange rates are often out of equilibrium and distort the pattern of trade and prevent the most efficient allocation of resources.

For example, a fixed exchange rate that is too high may lead the nation to export more of a commodity than would be justified. It may even lead the nation to export a commodity in which the nation has **comparative disadvantage**. This interferes with the efficient utilization of world resources and reduces the benefits from international specialization.

8.2B POLICY ADVANTAGES (20.2b)

- A flexible exchange rate system also means that the nation need not concern itself with its external balance and is free to utilize all **policies at its disposal to achieve its purely domestic goals of full employment**.
- The **achievement of internal balance would be facilitated** if monetary policy were free to be used alongside fiscal policy to attain the goal of full employment.
- The possibility of **policy mistakes and delays in achieving external balance would also be minimized**.
- Flexible exchange rates **enhance the effectiveness of monetary policy**. For example, an anti-inflationary policy that improves the trade balance will result in an appreciation of the domestic currency.
- Flexible exchange rates allow each nation to pursue **domestic policies aimed at reaching its own desired inflation-unemployment trade-off.**

- Flexible exchange rates also **prevent the government from setting the exchange rate at a level other than equilibrium** in order to benefit one sector at the expense of another. Developing nation may maintain a rate that is too low to encourage the importation of capital equipment needed for development. This discourages exports of agricultural and traditional commodities.
- Flexible exchange rate system **does not impose the cost of government interventions** in the foreign exchange market required to maintain fixed exchange rates.

This is the case for a **freely floating exchange rate system** in which there is no government intervention. A system that permits even a minimum of government intervention is referred to as a **managed floating exchange rate system.**

8.3 THE CASE FOR FIXED EXCHANGE RATES (20.3)

This rests on the alleged smaller degree of uncertainty that fixed exchange rates introduce into international trade and finance, on fixed exchange rates being more likely to lead to stabilizing rather than to destabilizing speculation

8.3A LESS UNCERTAINTY (20.3A)

- Advocates of a fixed exchange rate system avoids the **wild day-to-day fluctuations that discourage specialization** in production and the flow of international trade and investments.
- The question of time is also crucial. That is, **elasticities are likely to be higher and thus exchange rate fluctuations lower in the long run than in the short run.** Excessive short-run fluctuations in exchange rates under a flexible exchange rate system may be costly in terms of higher frictional. The short-run tendency of exchange rates to overshoot their long-run equilibrium.
- According to advocates of flexible exchange rates, the **uncertainty and instability surrounding the large discrete changes values that become necessary under a fixed exchange rate system are even more damaging and disruptive** to the smooth flow of international trade and investments than in fluctuating exchange rates. And the latter uncertainty can generally be hedged, the fixed rate cannot. However, it must be pointed out that under a **truly fixed exchange rate system**, such as the gold standard, the exchange rate is kept fixed, and so this uncertainty would be absent.

20.3B STABILIZING SPECULATION (20.3b)

- Advocates beleive speculation is more likely to be **destabilizing under a flexible rate** than under a fixed exchange rate system. With destabilizing speculation, **speculators purchase a foreign currency** when the exchange rate is rising, in the expectation that the exchange rate will rise even more, and sell the foreign currency when the exchange rate is falling.
- In the process, the fluctuations in exchange rates **resulting from business cycles are amplified**, and so are the uncertainty and risks involved in international transactions.
- Advocates of flexible exchange rates disagree. Anticipating a large change in fixed rates, speculators will then sell a currency that they believe is going to be devalued and buy a currency that they believe is going to be revalued (destabilizing speculation), often become self-fulfilling.

Under a truly fixed exchange rate system, such as the gold standard, exchange rates are always kept fixed, and a balance-of-payments adjustment is achieved by other means, no matter how painful.

According to Milton Friedman, speculation is stabilizing on the average because destabilizing speculation would lead to continuous losses. Speculators buy a foreign currency when its price is rising, but if it does not, they are forced to resell the currency at a lower price, thus incurring losses. If the process continues, it will bankrupt many of them. They must be able to purchase a foreign currency when it is cheap and resell it when it is expensive.

Destabilizing speculation can occur under a managed floating system as well as under a fixed exchange rate system of the Bretton Woods type. However, a majority of economists seem to believe that, under "normal" conditions, **speculation was for the most part stabilizing under both systems**.

8.3C PRICE DISCIPLINE (20.3c)

- Fixed exchange rate system impose a **price discipline**. The so-called **anchor argument** is that a nation with a higher rate of inflation than the rest of the world is likely to face persistent deficits in its balance of payments and loss of reserves under a fixed exchange rate system.
- On theoretical grounds, **flexible exchange rates do seem more inflationary than fixed exchange rates.** A devaluation under a fixed exchange rate system is also inflationary, while a revaluation fails to reduce domestic prices. However, since fluctuating exchange rates lead to overshooting of the equilibrium exchange rate in both directions and cause prices to rise when depreciating but fail to reduce prices when appreciating (the so-called **ratchet effect**), inflation is likely to be higher under a flexible than under a fixed exchange rate system.
- **Managed floating since has coincided with sharp inflationary pressures** throughout most of the world until the early 1980s. as the result of the sharp **increase in petroleum prices and excessive money creation** in most.
- Advocates of a flexible exchange rate system acknowledge that flexible rates can be more inflationary. However, this results because nations desire **different inflation—unemployment trade-offs**. Advocates of flexible exchange rates view this as an important advantage.
- **Flexible exchange rates to a large extent insulate the domestic economy from external shocks** much more than do fixed exchange rates. As a result, flexible rates are particularly attractive to nations subject to large external shocks. On the other hand, a fixed exchange rate system provides more stability to an open economy subject to large internal shocks.

By way of a summary, we might say that a flexible exchange rate system does not seem to compare unfavorably to a fixed exchange rate system as far as the type of speculation.

- Flexible exchange rates are **generally more efficient and give nations more flexibility** in pursuing their own stabilization policies.
- Flexible exchange rates are **generally more inflationary than fixed exchange** rates and less stabilizing and suited for nations facing large internal shocks.
- The greatest attraction of flexible exchange rates is that they allow the **nation to retain greater control over its money supply** and possibly achieve a lower rate of unemployment.
- The greatest disadvantage of flexible exchange rates is the lack of **price discipline and the large day-to-day volatility and overshooting** of exchange rates.

In general, a **fixed exchange rate system is preferable for a small open economy** that trades mostly with one or a few larger nations and in which disturbances are primarily of a monetary nature.
On the other hand, a **flexible exchange rate system seems superior for a large, relatively closed economy** with diversified trade and a different inflation-unemployment trade-off than its main trading partners, and facing primarily disturbances originating in the real sector abroad.

8.5 CURRENCY BOARDS ARRANGEMENTS AND DOLLARISATION (20.5)

We examine the benefits and costs of rigidly pegging or fixing the nation's exchange rate by establishing a currency board or by adopting another nation's currency (dollarization).

8.5A CURRENCY BOARD ARRANGEMENTS (20.5a)

Currency board arrangements (CBAs) are the most extreme form of **exchange rate peg (fixed exchange rate system),** short of adopting a common currency or dollarizing (i.e., adopting the dollar as the nation's currency).

- Under CBAs, the **nation rigidly fixes (often by law) the exchange rate of its currency to a foreign currency**, SDR, or composite, and its central bank ceases to operate as such.
- CBAs are similar to the **gold standard in that they require 100 percent international-reserve** backing of the nation's money supply.
- Thus, the nation gives up control over its money supply, and its central bank abdicates its function of conducting an independent monetary policy.

- With a CBA, the nation's money supply increases or decreases, respectively, only in **response to a balance-of-payments surplus and inflow** of international reserves or to a **balance-of-payments deficit and outflow** of international reserves.
- As a result, **the nation's inflation and interest rates are determined**, for the most part, by conditions in the country against whose currency the nation pegged or fixed its currency.
- A nation usually makes this extreme arrangement when it is in deep financial crisis and as a way to effectively combat inflation.
- The key conditions are a **sound banking system** and **a prudent fiscal policy**.
- The main advantage is the credibility of the **economic policy regime** which results in **lower interest rates and lower inflation**.
- The cost of CBAs is the inability of the nation's central bank to
  1. Conduct its own monetary policy
  2. Act as a lender of last resort to government
  3. Collect seignorage from independently issuing its own currency.

8.5B DOLLARIZATION 20.5b

Some nations go even further than making CBAs by adopting another nation's currency as its own legal tender.

- The process is usually **referred to as dollarization**.
- The benefits and costs of dollarization are similar to those of CBA, but more pronounced as dollarization involves an even more complete renouncement of the nation's monetary sovereignty by **practically giving up an "exit option"**.
- The benefits of dollarization arise from the nation;
  1. Avoiding the **cost of exchanging the domestic currency** for dollars and the need to hedge foreign exchange risks
  2. Facing a **rate of inflation similar to that of the united states** as a result of commodity arbitrage, and interest rates tending to fall to the U.S level, except for any remaining country risk (i.e., political factors that affect security and property rights in the nation)
  3. **Avoiding foreign exchange crises** and the need for foreign exchange and trade controls, fostering budgetary discipline
  4. Encouraging **more rapid and full international financial integration**.
- Dollarization also imposes some costs on the dollarizing country:
  1. The **cost of replacing the domestic currency** with the dollar (about 4 to 5 percent of GDP)
  2. The **loss of independence of monetary and exchange rate policies** (the country will face the same monetary policy of the United States, regardless of its cyclical situation)
  3. The **loss of its central bank as a lender of last resort** to bail out domestic banks and other financial institutions facing a crisis.

Good candidates for dollarization are small open economies for which the United States is the dominant economic partner and which have a history of poor monetary performance, and hence very little economic-policy credibility.

8.6 EXCHANGE RATE BANDS, ADJUSTABLE PEGS, CRAWLING PEGS AND MANAGED FLOATING (20.6)

The advantages and disadvantages of **hybrid exchange rate systems** with the characteristics of fixed and flexible rates.

8.6A EXCHANGE RATE BANDS (20.6a)

Most fixed exchange rate systems **allow the exchange rate to fluctuate within narrowly defined limits**. Nations decide on the exchange rate or par value of their currencies and then allow a narrow band of fluctuation above and below the par value. For example

- Under the **Bretton Wood the exchange rate was allowed to fluctuate below the par value/fixed rate**.
- Under the gold standard the rate between the dollar/pound could **fluctuate between the mint parity (gold points).**

The actual exchange rate under a fixed exchange rate system is determined by forces of demand and supply within the band and is prevented from moving outside this band by official intervention in foreign exchange markets under a fixed exchange rate system not tied to gold and by gold shipments.

The advantage of small band of fluctuation is that monetary authorities will not have to intervene constantly in foreign exchange markets to maintain the par value but only to prevent exchange rate from moving outside the allowed limits.

8.6B ADJUSTABLE PEG SYSTEMS (20.6b)

An adjustable peg system requires **defining the par value and the allowed band of fluctuation**, with the stipulation that the **par value will be changed periodically** and the **currency devalued to correct a balance-of-payments deficit** or **revalued to correct a surplus.**

- A truly adjustable peg system would be one under which nations with **balance- of-payments disequilibria** would take advantage of the **flexibility provided by the system and change their par values without waiting for the pressure** for such a change to become unbearable.
- Some **objective rule would have to be agreed upon and enforced to determine when the nation must change its par value** (such as when the international reserves of the nation fell by a certain percentage). Any such rule would to some extent be arbitrary and would also be known to speculators, who could then predict a change in the par value and profitably engage in destabilizing speculation.
- The disadvantage of an adjustable peg system is that it may lead to destabilizing speculation.

8.6D MANAGED FLOATING (20.6d)

Even if speculation were stabilizing, exchange rates would still fluctuate over time. Destabilizing speculation and overshooting would amplify these exchange rates. Exchange rate fluctuations reduce the flow of international trade and investments.

- The monetary authorities **intervene in foreign exchange markets to smooth out short-run fluctuations** without affecting the long-run trend in exchange rates.
- If they are successful, the nation receives the benefits from fixed exchange rates while at the same time **retaining flexibility in adjusting balance-of-payments disequilibria**.
- One possible difficulty is that monetary authorities may be in no better position than professional speculators, investors, and traders to know what the long-run trend in exchange rates is.
- There is however still a need for **international reserves**, whereas under a freely floating exchange rate system, balance-of-payments disequilibria are immediately and automatically corrected by exchange rate changes.
- The larger the nation's stock of international reserves, the greater is the exchange rate stabilization that it can achieve.

- There is, however, the danger that if the rules of leaning against the wind discussed earlier are not spelled out, a nation might be tempted to keep the **exchange rate high (currency at a depreciated level) to stimulate its exports.**
- Thus, in the absence of **clearly defined and adhered-to rules of behavior**, there exists the danger of distortions and conflicts that can be detrimental to the smooth flow of international trade and investments.

8.7 INTERNATIONAL MACROECONOMIC POLICY COORDINATION (20.7 IN TB)

International Macroeconomic Policy Coordination is the **modification of national economic policies of international interdependence.**
The increase in the world economy has sharply **reduced the effectiveness** of national economic policies and increased their **spill-over effects** on the rest of the world. With the increase in globalisation and thus interdependence, macroeconomic policy coordination has become essential.

There are several obstacles to successful and effective international macroeconomic policy coordination;

1. The **lack of consensus** about the functioning of the international monetary system.
2. **Lack of agreement** on the precise policy mix required.
3. Problem of **how to distribute the gains from successful policy coordination** among the participants and how to spread the cost of negotiating and policing agreements.

Empirical research shows that the welfare gains from coordination when they occur are not very large.

STUDY UNIT 9 - THE INTERNATIONAL MONETARY SYSTEM: PAST, PRESENT AND FUTURE (21)

9.1 INTRODUCTION (21.1)

An international monetary system (**monetary order or regime**) refers to the rules, customs, instruments, facilities, and organizations for effecting international payments. They can be classified according to the way in which **exchange rates are determined** or according to the form that international **reserve assets take**.

- **Under The exchange rate classification** - we can have a fixed exchange rate system with a narrow band of fluctuation about a par value, a fixed exchange rate system with a wide band of fluctuation, an adjustable peg system, a crawling peg system, a managed floating exchange rate system, or a freely floating exchange rate system.
- **Under the international reserve classification -** we can have a gold standard, a pyre fiduciary standard or a gold-exchange standard (a combination of the previous two).

The various classifications can be combined in various ways. An international monetary system can be evaluated in terms of:

1. **Adjustment -** the process by which balance-of-payments disequilibria are corrected. A good international monetary system is one that minimizes the cost of and the time required for adjustment.
2. **Liquidity -** the amount of international reserve assets available to settle temporary balance-of-payments disequilibria. A good international monetary system is one that provides adequate international reserves so that nations can correct balance-of-payments deficits without deflating their economies or being inflationary.
3. **Confidence -** the knowledge that the adjustment mechanism is working adequately and that international reserves will retain their absolute and relative values.

9.2 THE GOLD STANDARD AND THE INTERWAR EXPERIENCE (21.2)

9.2A THE GOLD STANDARD PERIOD (1880–1914)

The gold standard operated from about 1880 to 1914. Each nation defined the gold content of its currency and stood ready to buy or sell any amount of gold at that price.

- **Mint parity -** The gold content in one unit of each currency was fixed, exchange rates were also fixed. The exchange rate could fluctuate above and below the mint parity by the **cost of shipping an amount of gold equal to one unit**.
- The exchange rate was determined within the gold points by the **forces of demand and supply** and was prevented from moving outside the gold points by gold shipments.
    - The tendency of a currency to **depreciate was halted by gold outflows**.
    - The tendency of a nation's currency to **appreciate was halted by gold inflows**.
- **The outflows** represented the deficit in the nation's balance of payments.
- **The inflows** measured the surplus in the BOP.

The adjustment mechanism was the **automatic price-specie-flow mechanism**, which operated as follows:

- Since each nation's money supply consisted of either gold itself or paper currency backed by gold, the **money supply would fall in the deficit nation and rise in the surplus nation**.
- This would cause internal prices to **fall in the deficit nation** and **rise in the surplus nation** (quantity theory of money).
- In the **deficit nation exports would be encouraged and imports discouraged** until its BOP deficit was eliminated. The opposite would occur in the surplus nation.
- Allowing its money supply to change meant that a nation could not use monetary policy for achieving full employment without inflation. This created no difficulties for classical economists, since they believed that there was an automatic tendency in the economic system toward full employment without inflation.
- For the adjustment process to operate, **nations were not supposed to sterilize** (i.e., neutralize) the effect of BOP deficit or surplus on the nation's money supply. The rules of the game of the gold standard required a **deficit nation to reinforce the adjustment process** by further **restricting credit** and a surplus nation to further **expand credit**.
- However, Nurkse and Bloomfield found that monetary authorities sterilized part, though not all, of the effect of a balance-of-payments disequilibrium on the nation's money supply.

- Michatly argued that this was necessary to moderate the adjustment process and prevent an excessive reduction in the deficit nation's money supply and an excessive increase in the surplus nation's money supply.

Taussig found that balance-of-payments disequilibria were settled mostly by **international capital flows** rather than through gold shipments. For example, when the United Kingdom had a balance-of-payments deficit, its money supply fell, interest rates rose, and this attracted a short-term capital inflow to cover the deficit. It was these capital flows that effectively maintained balance of payments equilibrium – which explains the success of the early gold standard – not the changes in relative prices and trade flows emphasised by the price specie-flow mechanism.

9.2B THE INTERWAR EXPERIENCE (20.2b)

With the outbreak of WW1 the classical gold standard came to an end. The period from 1919 to 1924 was characterized by wild fluctuations in exchange rates. The UK and other countries attempted to return to the gold standard. The new system was more of a gold exchange standard than a pure gold standard in that both gold and currencies were used as international reserves. This **economized on gold**, which had become a much smaller percentage of the total value of world trade.
This attempt failed due to fundamental causes such as;

- **Lack of adequate adjustment**, such as nations sterilised the effect of balance of payment imbalances on their money supply.
- The **huge destabilising capital flows** between London and the emerging international monetary centers of NY and Paris.
- The **outbreak of the great depression**.

There followed a period of competitive devaluations as each nation tried to "export" its unemployment. This together with the serious trade restrictions imposed by most nations cut international trade almost in half. The interwar experience clearly indicated the **prevalence of destabilizing speculation and the instability of flexible exchange rates.**

9.3 THE BRETTON WOODS SYSTEM (21.3)

9.3A THE GOLD EXCHANGE STANDARD (21.3a)

The Bretton Wood System was the outcome of an international conference held at Bretton Woods, New Hampshire (USA) in 1944. It sought to restore stability and confidence in the international payments mechanism, but without the rigidities of a fixed exchange rate system implied by a pure gold standard. The system devised at Bretton Woods called for the establishment of the **International Monetary Fund (IMF)** for the purpose of:

1. Overseeing that countries followed a set of agreed upon **rules conduct in international trade and finance**.
2. Providing **borrowing facilities for countries** in temporary balance of payments difficulties.

The Bretton Wood System was **gold exchange standard**. The US government was prepared to **convert dollars into gold** on demand at the fixed price of $35 per ounce. Other countries were to **fix the price of their currencies** against the dollar or gold and **intervene in foreign exchange markets** to keep the exchange rate from fluctuating more that 1 percent above or below the par value.
The exchange rate was determined by the **forces of demand and supply** within the allowed band of fluctuation. Countries were to draw from their foreign reserves in order to ensure that changes in the value of their currencies did not exceed the limits. The US dollar was the main intervention currency.
Nations were to fiancé temporary balance of payment deficits out of their own international reserves and by borrowing from the IMF. However, a country with a more serious deficit could change the par value of its currency by 10 percent and above with the approval of the IMF. Changes less than 10 percent were allowed without the fund's approval. Thus the Bretton Wood system was in the nature of an adjustable system.

After the war, nations were to remove all **restrictions on the full convertibility** of their currencies into other currencies. Nations were forbidden to impose additional trade restrictions and existing trade restrictions were to be removed gradually.
Restrictions on international liquid capital flows were permitted to allow nations to protect their currencies against large destabilizing, or "hot." international money flows.

9.3B BORROWING FROM THE INTERNATIONAL MONETARY FUND (21.3b)

Each nation was assigned a quota into the fund depending on its importance in international trade. The size of a nation's quota determined its voting power and its ability to borrow from the fund. A nation had to pay 2 percent of its quota in gold and the remaining 75 percent in its own currency.
A nation in balance of payment difficulties could borrow 2 percent of its quota from the fund each year by depositing more of its currency in exchange for convertible currencies until the Fund held no more than 200 percent of the nation's quota.

- **The gold tranche -** a member nation could borrow no more than 25 percent of its quota automatically in any one year, up to a total of 125 percent of its quota over a five-year period.
- **The credit tranches -** for further borrowings, the fund charged higher interest rates and imposed more supervision and conditions to ensure that the deficit nation was taking appropriate measures to eliminate the deficit.
- **The super gold tranche -** if the fund's holding of a nation's currency fell below 75 percent of its quota, the nation could borrow the difference from the fund without having to repay its loan.

9.4 OPERATION AND EVOLUTION OF THE BRETTON WOODS SYSTEM (21.4)

9.4A OPERATION OF THE BRETTON WOODS SYSTEM (21.4a)

The Bretton Woods system envisaged and allowed changes in par values in cases of fundamental disequilibrium, but nations were very **reluctant to change their par values**. Deficit nations were reluctant to devalue their currencies because they regarded this as a sign of national weakness. Surplus nations resisted needed revaluations, preferring instead to continue accumulating international reserves.
The unwillingness of industrial nations to change their par values as a matter of policy when in fundamental disequilibrium had two important effects:

1. It **robbed the system of most of its flexibility and the mechanism** for adjusting balance-of-payments disequilibria
2. The reluctance of industrial nations to change their par value when in fundamental disequilibrium gave rise to huge destabilizing international capital flows by providing an **excellent one-way gamble for speculators**.

Continued speculation against the dollar ultimately led to the decision by the Nixon administration in August 1971 to end the US convertibility of the dollar into gold. This step effectively ended the Bretton Woods system.
There were three main problems with the Bretton Woods adjustable peg exchange rate system.

1. Economically powerful countries were **reluctant to devalue or revalue their currencies**, even when experiencing chronic balance of payments deficits or surpluses respectively. Devaluation in particular was regarded as an admission of failure.
2. The **world trade grew at a much faster** rate than the increase in the world's stock of gold after 1944.
3. This led to a **liquidity problem which was met by increasing US balance of payments deficits** and an outflow of dollars to other countries. The accumulation of dollars outside US led to declining confidence in the USA to maintain dollar-gold convertibility at the fixed dollar gold price and led to **disruptive speculation against the dollar**.

9.4B EVOLUTION OF THE BRETTON WOOD SYSTEM (21.4b)

The IMF negotiated the General Arrangements to Borrow (GAB) from the Group of Ten most important industrial nations to supplement it resources. Member nations began to negotiate standby arrangements. Central banks also negotiated swap arrangements to exchange each other's currency to be used to intervene in foreign market to combat hot flows.
Special Drawing Rights (SDRs) were created to supplement international reserves of gold and foreign exchange. SDRs are simply accounting entries in the books of the IMF. They are not backed by gold or any other currency. They can only be used central banks to settle balance of payment deficit and surpluses but cannot be used by commercial banks.
In 1961 the gold pool was set up to prevent the price of gold from rising above the official price of $35. It collapsed as a result of the gold crisis in 1968 when the two tier gold market was established. This kept the price of gold at $35 an ounce among central banks while the commercial price of gold could rise above the official price and be determined by forces of demand and supply. Over the years membership in the IMF increased to include many countries of the world. Despite the shortcoming of the Bretton Wood s System, world output grew rapidly and international trade grew even faster. Thus the Bretton Wood s System served the world community well until the mid 1960s.

9.5 US BALANCE-OF-PAYMENTS DEFICITS AND COLLAPSE OF THE BRETTON WOODS SYSTEM (21.5)

9.5A THE US BALANCE OF PAYMENT DEFICITS (21.5a)

From the 1945 to 1949 the US ran a huge balance of payment surpluses with Europe and gave aid to European reconstruction. Europe recovered by 1950 and the US suffered a deficit. These allowed the European nations and Japan to increase their international reserves. This was a period of a dollar shortage. The US settled its deficits mostly in dollars. Surplus nations were willing to accept dollars because:

1. The US stood ready to **exchange dollars for gold** at the fixed rate of $35 an ounce.
2. The dollar could be used to **settle international transactio**ns with any country
3. **Dollar deposits earned interest** while gold didn't.

In 1958 the US balance of payment deficit increased sharply due to large capital outflows and high inflation rate. Since the US financed its deficit mostly in dollars, its gold reserves declined. Because the dollar was an international currency, the US could not devalue to correct its deficit instead it adopted a number of other policies which had very limited success.
In 1970 the US deficit persisted and rose and sharply reduced the US gold reserves. The US attempted unsuccessfully to persuade surplus nations (Germany and Japan) to revalue their currencies. This led to the expectation that the US would sooner or later have to devalue the dollar. This expectation in turn led to huge destabilizing capital movements against the dollar and the suspension of the convertibility of the dollar in 1971. The Bretton Wood s System collapsed.
The ability of the US to settle its balance of payment deficit with gold gave the US a privilege that was not available to other countries. This benefit accruing to a country from issuing currency or when its currency is used as an international currency is referred to as seigniorage. However the US paid a heavy price for its seigniorage as it was unable to devalue the dollar without bringing the Bretton Wood s System down.

9.5B COLLAPSE OF THE BRETTON WOOD S SYSTEM (21.5b)

The immediate cause of the collapse of the Bretton Wood s System was the expectation in the late 1970 and 1971 in the face of the **huge balance of payment deficits**, that the US would soon be forced to devalue the dollar. This led to a massive outflow of liquid capital from the US which prompted the US to suspend the convertibility of the dollar into gold and to impose a temporary 10 percent import surcharge.
In 1971 the Group of Ten agreed (Smithsonian Agreement) to increase the dollar price of gold from $35 to $38 an ounce. This meant the dollar was devalued by 9 percent. The band of fluctuation was increased from 1 percent to 2.5 percent. The dollar remained **inconvertible into gold and the world was on a dollar standard**, i.e. dollar remaining an international currency and reserve without any gold backing.

However in 1972 the US faced another deficit. It was clear that the Smithsonian Agreement was not working. Another devaluation of the dollar was required. This expectation led to renewed speculation against the dollar and became self-fulfilling in 1973 when the US was once again forced to devalue the dollar. When speculation against the dollar increased again, monetary authorities in major industrial nations decided to **let their currencies float independently or jointly against the dollar**. This was called the **European snake**. This gave birth to the **present managed floating exchange rate system**.

While the immediate cause of the collapse of the Bretton Woods System was the huge balance of payment deficit of the US. The main cause is to be found in the interrelated problems of **liquidity, adjustment and confidence**. Liquidity refers to the amount of international reserves available to nations to settle temporary balance of payment disequilibria.
International liquidity is needed so that countries can finance balance of payment deficits. Inadequate liquid hampers the expansion of world trade. On the other hand excessive liquidity leads to inflationary pressures.
Under the Bretton Woods System most liquidity was provided by an increase in the foreign exchange arising from the US balance of payment deficits. However the longer the balance of payment deficits persisted and the more **unwanted dollars accumulated in foreign hands** the **smaller the confidence** in the dollar. There was a dollar glut.
The US was unable to correct its large and persistent balance of payment deficits because of its inability to devalue the dollar, thus **the Bretton Woods System lacked an adequate adjustment mechanism** that nations would be willing and able to utilize as a matter of policy. The deficit persisted and this undermined confidence in the dollar.

9.6 THE INTERNATIONAL MONETARY SYSTEM: PRESENT AND FUTURE (21.6)

9.6A OPERATION OF THE PRESENT SYSTEM (21.6a)

The present system of managed floating exchange rates came into effect by default at the end of the short-lived Smithsonian system in 1973. It was a temporary informal arrangement, but it became accepted as the de facto international payments mechanism and was formalised at an IMF conference in Kingston, Jamaica in 1976. The main features of the new arrangement were as follows:

1. **Freedom of choice of exchange rate regime**, whereby member countries can choose the degree of exchange rate flexibility, depending on their individual circumstances. This has led to a wide variety of exchange rate regimes, less than half of which are floating.
2. **Monitoring of member countries' exchange rates by the IMF to promote the adoption of macroeconomic policies that will maintain exchange rate stability**. Also, new credit facilities have been introduced since 1973. Regarding some developing countries, the **structural adjustment facility** became a thorny issue. Introduced in 1986, it provides concessionary loans to low-income developing countries with serious balance of payments problems. These loans are conditional on the implementation of supportive domestic macroeconomic policies and structural adjustment programmes. These policies are usually deflationary and have therefore had harsh consequences for some countries, in terms of lower growth and higher unemployment.
3. **Abolition of the official fixed gold price and the demonetisation of gold**. The IMF sold about one-third of its gold holdings between 1976 and 1980 and is no longer obliged to use gold in certain transactions.
4. **A greater role for special drawing rights (SDR) in international payments**. The SDR has to some extent replaced the dollar as a unit of account at the IMF and all quotas and reserves are expressed in SDR. The valuation of the SDR has changed from a gold-based valuation to a basket of currencies including the US dollar, euro and British pound.

Within the general floating exchange rate system, the **European Monetary System (EMS)** was a significant exception because it was based on an arrangement similar to that of the Bretton Woods adjustable peg. Payments between the European countries concerned took place against the **fixed but adjustable parities of their currencies** against the European Currency Unit (ECU). However exchange rates against currencies outside the EMS, **floated in response to market** forces.

Very few countries have adopted a **clean float of their currencies with no intervention** by the monetary authority in the foreign exchange markets. Many countries have opted for a **floating exchange rate** whereby the central bank intervenes in the foreign exchange market to smooth out excessive volatility. This should be distinguished from **dirty floating** whereby the central bank intervenes to maintain a lower than average market value for the currency.

Under a **clean float**, the exchange rate **adjusts immediately to clear any excess demand for or supply** of foreign currency in the foreign exchange market. The central bank does not need to hold foreign exchange reserves since the net balance of payments is always zero. The less the monetary authority intervenes in the foreign exchange market, the more volatile the exchange rate is likely to be in response to changes in demand and supply.
The actual and perceived **disadvantages of such volatility** led many countries to adopt managed floating exchange rate policies and their central banks to continue to hold stocks of foreign exchange reserves so that they could intervene in the markets when deemed necessary.

9.6C PROBLEMS WITH PRESENT EXCHANGE RATE ARRANGEMENTS (21.6c)

The most significant monetary problems facing the world today are

1. The **excessive fluctuations and large misalignment in exchange rates**
2. The **failure to promote greater coordination** of economic policies among leading industrial nations
3. The **inability to prevent international financial crises** or to deal with them adequately when they do rise.

A closely related problem to exchange rate misalignment is the huge **dollar overhang** which is the quantity of dollars in the hands of foreigners ready to move from monetary centre to monetary centre in response to changes in international interest differential and expectations of exchange rates.
One proposal aimed at eliminating this problem involves converting all foreign held dollars in to SDRs by the introduction of a substitution account by the IMF. No action has taken place.

9.6D PROPOSAL FOR REFORMING PRESENT EXCHANGE RATE ARRANGEMENTS (21.6d)

Target zones proposed by Williamson

Under such a system the leading industrial nations estimate the equilibrium exchange rate and agree on the range of allowed fluctuations. A **band of allowed fluctuation rate of 10 percent**. Exchange rate is determined by forces of demand and supply within allowed band and is prevented from moving outside the target zones by intervention the foreign exchange markets. Critics of target zones believe that target zones have the worst characteristics of fixed and flexible exchange rate system. As in the case of flexible exchange rates, **target zones allow substantial fluctuations and volatility** in exchange rates and can be inflationary. As in the case of fixed exchange rates target zones can only be defended by official interventions in foreign exchange markets and thus reduce the monetary independence of the nation.

Extensive policy coordination among leading countries

Under this system, the **US, Japan and EMU would fix the exchange rates among their currencies** at their equilibrium level and then coordinate their monetary policies to keep the exchange rate fixed.

Development of **objective indicators of economic performance** to signal type of coordinated macroeconomic policies for nations under the supervision of the IMF to keep the world economy growing along a sustainable non-inflationary path. These are GNP, inflation, unemployment, trade balance, growth of the money supply, fiscal balance, exchange rates, interest rates and international reserves. However as long as nations have **different inflation-unemployment trade-offs**, effective macroeconomic policy coordination is practically impossible.

Restricting international speculative capital flows

Huge international capital flows in today's highly intergraded international capital markets are the **primary cause of exchange rate instability and global imbalances** affecting the world economy. Ways to restrict international speculative capital flows:

- Tobin would do this with a **tax that becomes progressively higher** the shorter the duration of the transaction.
- Dornbusch and Frankel would instead reduce international capital flows using **dual exchange rates- a less flexible** one for trade transactions and a more flexible for purely financial transactions not related to international trade and investments. By restricting international "hot money" flows through capital market segmentation of asset markets,
- Tobin, Dornbusch and Frankel believed that the financial system could be made to operate much more smoothly and **without any need for close policy coordination**.

Single world currency advocated by Mundell because a global economy requires a global currency.

9.6E FINANCIAL CRISES IN EMERGING MARKET ECONOMIES (21.6e) (read with Portfolio investment in study unit 1)

Another serious problem facing the present international monetary system is its inability to prevent international financial crises in emerging and advanced economies. During the past decade, there were a series of financial and economic crises. Although the main problem that led to these crises was different, the process was very similar. Each crisis started as a result of a **massive withdrawal of short term liquid funds at the first sign of financial weakness**. Foreign investors poured funds into many emerging markets in the early markets in order to take advantage of high returns and in order to diversify their portfolios but immediately withdrew their funds on a massive scale at the first sign of economic trouble in the country thereby sparking off a crisis.

Measures have been proposed or taken to avoid or minimise such crises. These include:

1. **Increasing transparency in international monetary relations**
2. **Strengthen banking and financial system and**
3. **Promoting greater private sector involvement**.

Financial crises are not confined to emerging markets. In 2008 the US and most other developed nations faced a serious financial and economic crisis. The G20 economies proposed policies to overcome deep financial and economic crisis and push for reforms to prevent future crises based on:

1. **Strengthening financial supervision and regulation**
2. **Fostering international policy coordination**
3. **Reforming the IMF and**
4. **Maintaining open markets**.

9.7 EXCHANGE RATE POLICY AND MANAGEMENT IN SOUTH AFRICA (Study Guide)

During the Bretton Woods era, the external value of the rand was largely determined by its link to the British pound and changes in the parity value of the latter against the US dollar. For most of this time, the exchange rate of the rand was relatively stable, supported by strong growth in commodity exports, especially gold.

The IMF introduced a two-price system for gold in 1968, separating official from private transactions in gold. The free-market price of gold soon began to increase significantly above the official $35 per ounce, driven higher by the rapid increase in world inflation following the oil price shocks in 1973. After the demise of the Bretton Woods system, the domestic authorities experimented with pegging the value of the rand to the British pound and the US dollar, although neither of these arrangements lasted for long. The rand remained relatively stable for most of the 1970s and was again supported by significant increases in the value of gold exports, this time in the form of sharp increases in the gold price, which peaked at an annual average price of over $600 in 1980.

In 1979, the De Kock Commission published its initial findings and recommendations on monetary and exchange rate policy in South Africa. We will focus on events and changes after 1979. The main concern here is with exchange control and the form it took in South Africa after 1979. Exchange controls were first introduced in South Africa in 1939 by the UK in response to the monetary dislocation caused by the onset of the Second World War. They have remained in place until the present day, although the form and severity of the controls have changed significantly during this time.

Two main types of exchange controls have been applied in South Africa: direct quantitative controls or rationing of foreign currency to residents, and more market-oriented control over foreign investment by nonresidents through a two-tier foreign exchange market and a dual exchange rate mechanism. The latter saw various changes after the imposition of blocked rand accounts in 1961, the year before. However, the controls culminated in a system whereby the foreign exchange market was separated into a market for trade-related foreign exchange flows and another for certain financial account transactions. This implied two different exchange rates for the rand: a commercial rand and a financial rand exchange rate. The commercial rand was generally more stable than the financial rand, which generally stood at a substantial discount to the former. This reflected negative foreign investor sentiment towards South Africa for most of the time during which such exchange controls were applied.

One of the main recommendations of the De Kock Commission's interim report in 1979 was to relax exchange controls significantly and to adopt a unified foreign exchange market, allowing market forces to determine the value of the currency. Hence it envisaged a managed float of the exchange rate with the removal of dual exchange rates and limited quantitative exchange controls on residents. The authorities implemented these recommendations in 1983. In addition, gold-mining companies received the dollar proceeds from their gold sales rather than the rand equivalent paid by the South African Reserve Bank, which had been the practice before. Also, the Reserve Bank ceased to quote the rand/dollar exchange rate and announced steps to develop the forward exchange market. These measures helped the adoption of a managed floating unitary exchange rate system, which remained in place until 1985.

The politically inspired events of 1985 led to the forced abandonment of this system and the reintroduction of exchange controls, including once again controls over nonresidents via the financial rand. A moratorium was declared on the repayment of about half of South Africa's foreign debt, which was rescheduled into longer-term debt with fixed repayments being negotiated up to the year 2001.

With the election of the new government of national unity in 1994, foreign perceptions of South Africa changed fundamentally. The authorities took this opportunity to open up the economy to promote competition and efficiency and to encourage greater levels of foreign investment and participation in the economy. This entailed the removal of exchange controls on nonresidents and the partial relaxation of quantitative exchange controls on residents.

Until recently, the Reserve Bank followed a fairly active managed floating exchange rate policy, allowing market forces to determine the value of the rand but subject to periodic intervention to smooth out what was regarded as excessive volatility in the exchange rate. This was clearly evident in 1998 in response to intense speculation against the rand following the emerging

markets' crisis at that time. Owing to the limited stock of foreign exchange reserves at this time, the Reserve Bank also intervened heavily via the forward exchange market to defend the exchange rate of the rand. When this failed, it increased interest rates to what were historically near-record levels. Such intervention was deemed necessary to limit the pass-through effect of a sharply depreciating rand on domestic prices and inflation. A huge disadvantage of such intervention was the high net forward liability incurred by the Reserve Bank which reached $25 billion by September 1998. Since then, the Reserve Bank has succeeded in reducing the oversold forward book in stages to a net zero position. At present, the Reserve Bank seldom intervenes in the markets, even when the rand is under intense speculative pressure and appears to be significantly undervalued or overvalued, as the case may be.

Nowadays the Reserve Bank's main concern is to meet the inflation targets set by the government, instead of trying to manage the exchange rate and the external value of the rand. Thus the Reserve Bank's current exchange rate policy is closer to a clean float than the managed floating exchange rate policy followed before. It is hoped that the elimination of the oversold forward book and the increase in foreign exchange reserves will see greater stability in the local foreign exchange market than has been the case for most of the last decade. For a few years, the Minister of Finance has continually been announcing relaxation of the remaining exchange controls and it could be that the idea is to eventually do away with such controls.