CHAPTER 2

BALANCE OF PAYMENTS

A. BALANCE OF PAYMENTS: A GENERAL VIEW

Balance of payments (BOP) of a country is the official record of the aggregate receipts and payments of all of its residents for their economic and financial transactions with their counterparts in the rest of the world over a *defined* period of time. The U. S. Department of Commerce keeps this record for the United States and publishes it in the *Survey of Current Business*. Table 2.1 exhibits one of these regular statements on U. S. balance of payments.

Table 2.1

These international transactions of economic and financial character refer to exports and imports of goods and services, unilateral transfers - that is, unrequited payments (such as gifts and aids for the people of a disaster-striken country for which no financial compensation is required), capital inflows and outflows, net change in gold, gold tranche at the International Monetary Fund (IMF) and holdings of convertible foreign currencies. The items that remain undetected by official counting are recognized as errors and omissions, which are alternatively called "statistical discrepancy" (the term chosen by the U. S. Department of Commerce to identify the entry under this category as residual) or "balancing item" (by the British).

Balance of payments is constructed as an accounting statement based on double-entry bookkeeping practice. Every transaction is entered in both sides of the balance sheet as a credit and a debit item. If, for instance, a U.S. exporter sells $400 million dollars worth of rice to a Japanese importer under the terms that payments will be due in 30 days, the U.S. balance of

payments will record $400 million as credit in its *balance on merchandise trade* (or *current account balance* - the term will be explained later in this chapter), and a debit of $400 million will appear in the U. S. balance of payments in the short-term capital account. The reader is encouraged now to take a look at Table 2.1 to have a good view of the U. S. balance of payments, balance of trade, capital account balance, and any subsection thereof. The International Monetary Fund: Financial Statistics provides the in-depth summary statistics on balance of payments of all its member countries on monthly and yearly basis.

It high time now that we provide a more convenient picture of balance of payments of a country so that we do not have to look at those number to understand the mechanics of this structure for further analytical exposition. With that objective in view we express balance of payments as follows:

$$BOP \equiv X - M + UT + K_I - K_O + NOR + E\&O \tag{2.1}$$

where

$X \equiv$ total export revenues for the country,

$M \equiv$ total import expenditure of the country,

$NUT \equiv$ total unilateral transfers from the country (net),

$K_I \equiv$ total capital inflow into the country,

$K_O \equiv$ total capital outflow from the country,

$NOR \equiv$ Official reserves of gold, Special Drawing Rights (SDR), reserve position in the IMF, and foreign currencies held by the country (net),

$E\&O \equiv$ errors and omissions ("statistical discrepancy").

A shorter version of Table 2.1 is now given in Table 2.2 for better clarity and

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Table 2.2

The U.S. Balance of Payments of 1991 (billions of U.S. dollars)

Credits		Debits	
a. Exports of civilian goods	$224.4	*b*. Imports of civilian goods	$368.7
c. Military sales abroad	8.9	*d*. Military purchases abroad	12.6

Trade Balance = $(a + c) - (b + d)$ = - $148.0 (deficit)

e. Export of services (investment income and fees earned, foreign tourism in the U.S. etc.)	$139.5	*f*. Import of services (investment income paid out, U. S. tourism abroad, etc.)	$117.2
		g. Net Unilateral transfers (gifts)	$15.7

Current Account Balance = $(a + c + e) - (b + d + f + g)$
= -$141.4 (deficit)

h. Foreign private investment in the U.S.	$202.7	*i*. U.S. private investment overseas	$94.4
j. Foreign official lending in the U.S.	34.7	*k*. U.S. government lending overseas	1.9

Capital Account Balance = $(h + j) - (i + k)$ = $141.1 (surplus)

l. Net increase in U.S. official reserves	$0.3

Official Reserve Balance = l = $0.3 (surplus)

NOTE: Item *h* includes net errors and omissions of $23.9
SOURCE: *Survey of Current Business, U. S. Department of Commerce*, September 1987.

comprehension of the items in balance of payments accounts. In Table 2.2, $(a + c + e) \equiv X$ of equation (2.1), $(b + d + f) \equiv M$ of equation (2.1), $g \equiv$ NUT, $(h + j) \equiv K_I$, $(i + k) \equiv K_O$, $l \equiv$ NOR, and, as already noted at the bottom of Table 2.2, a fraction of *h* in the Table 2.2 reflects the errors and omissions (E&O). It is clear now that:

X - M = Balance of Trade (BOT) (when relatively invisible items such as items in *e* and *f* are excluded).

X - M + NUT = Current Account Balance (CUB) when relatively invisible items such as items in *e* and *f* are *not* excluded). Current account balance is thus trade balance plus items under $(e - f) + g$. Since, in most of the time, for a country, $(e - f)$ is close to negligible, and so is the value of g ($\equiv$ NUT), we often tend to regard a country's balance of trade and its current account balance as synonymous.

As Table 2.2 shows, capital inflows into a country refers to items such as *h* and *j*, - that is, $K_I \equiv h + j$, and similarly, capital outflows from a country are measured by items *i* and *k*. Therefore, $K_O \equiv i + k$. The gap between capital inflows into a country and the capital outflows from the country is the measure of capital account balance (CAB) [alternatively, called net capital inflows (or outflows)]. That is:

$$K_I - K_O \equiv CAB$$

One often ignores the usually very small magnitudes of net official reserves and errors and omissions that appear in a country's balance of payments. If that is taken as an acceptable matter for most considerations, then one can view balance of payments realistically as follows:

$$BOP = CUB + CAB \tag{2.2}$$

It is already pointed out (through the example of a U. S. exporter selling $400 million worth of rice to a Japanese importer) that $400 million appears as credit in the U. S. merchandise account, but the same amount appears as debit in the U.S. capital account. This is true always when the accounting view of balance of payments is taken. What appears as a credit (debit) in the current account balance will appear as debit (credit) in the capital account balance. That is, the algebraic *sign* of CUB and CAB will be opposite. If balance of payments is in balance, that is, BOP is zero, then

$$CUB = - CAB \quad \text{or} \quad CUB + CAB = 0.$$

Now consider a few basic facts in balance of payments. A casual examination of balance of payments statistics brings out that current account balance describes the overall trade flows on goods and services and unilateral remittances of one country *vis-a-vis* the rest of the world. From our previous observations then it appears that if a country runs surplus in this account, and if a line is drawn after this account, the remaining accounts will show a deficit, and *vice versa*. So, if United Kingdom has deficit in its current account balance, it is showing surplus in its

capital account balance. We have given a picture of capital account balance, and yet it needs further elaboration at this stage. Capital inflows and outflows are often recognized in two distinct senses: long-term capital flows and short-term capital flows. First of all, flows refer to the change in the stock of capital, and if the capital (credit) instruments involved are of short maturity (usually less than or equal to one year), then capital flows are construed as short-term capital inflows or outflows, depending on the direction of its movement. Bank deposits (withdrawals), commercial and financial papers and acceptances, loans and the like are examples of short-term capital flows. Long-term capital flows refer to items such as purchase (sale) of equity capital, real estates, long-term bonds and so on.

Long-term capital is viewed under two distinct categories: *direct* investment, and *portfolio* investment. In direct investment control of the capital involved resides in the hands of individual(s) living in a different country. Thus, if a group of Japanese individuals or a Japanese corporation has effective control in a business venture located in the United States, it should be interpreted as direct investment by Japan. If foreigners hold 25 percent or more of voting stock of a U. S. corporation, then it is considered as a direct foreign investment. It is also considered as direct foreign investment if all U. S. stock holders together hold 50 percent or more of voting stock, even when no affiliated group holds as much as 25 percent of equity interest. In practice, in the U. S. balance of payments statistics, it has been defined as direct foreign investment when a U. S. resident or a group of residents has 10 to 25 percent of equity interest in foreign enterprise. The distinction between short-term and long-term investment is not made in case of direct foreign investment. For multinational corporations operating all over the world, direct investment is a standard feature. As opposed to *direct investment*, *portfolio investment* refers to

capital ownership without control in management. Saudi Arabia's princes and wealthy foreign investors hold a lot of long-term securities, real estates, commercial credits and bank loans, and thus they hold a good deal of portfolio capital.

For policy makers in the Treasury, and Commerce Departments of the government, it has been and it should be recognized which components of balance of payments are outcomes of a given set of economic realities in the world, and which components are the policy-induced adjustments to the reality-induced entries in the balance of payments. Meade [2] called the first set of components *autonomous* transactions, and the second set of components *accommodating* transactions. *Accommodating* transactions are made to respond to the *autonomous* transactions in an effort to keep the balance in line. Sometimes, however, accommodating transactions take place automatically, but in most other situations policy makers usually make the adjustment transactions. In the former case, accommodating transactions are called *automatic*, and in latter case, these accommodating transactions are called *discretionary*. Usually, most often items under current account balance occur because of pecuniary motive or sense of philanthropy. On the other hand, purchases or sales of currency in foreign exchange markets and/or purchases or sales of gold by governments, etc. can be identified as *accommodating* transactions balance. Since balance of payments so far has been a double-entry bookkeeping account of credits and debits, balance of payments always balances. Against that backdrop then, autonomous balances always equal accommodating balances. More clearly,

autonomous balances + accommodating balances = 0

B. BALANCE OF PAYMENTS: SPECIFIC VIEWS

I. Basic Balance (B_B)

In the existing literature, balance of payments has been dissected for various reasons of analysis or emphasis in policy prescription. Here we bring out three types of balances: (i) Basic Balance (B_B), (ii) Liquidity Balance (B_L) or alternatively called, Overall Balance (BO), and (iii) Official-Settlements Balance (B_O.S).

Basic balance is defined as follows:

$$B_B \equiv X - M + NUT + K_{LT} \equiv -(K_{ST} + NOR + E\&O) \qquad (2.3)$$

where $K \equiv K_I - K_O$, and $K \equiv K_{LT} + K_{ST}$, and K_{LT} and K_{ST} represent long-term and short-term capital flows. Notice that basic balance of a country includes the long-term net capital flows in its current account balance. This part of the balance of payments is considered as the autonomous balance of the country, and short-term net capital flows, net official reserves and errors and omissions together measure the *accommodating* balance of the country. In the United States, this balance was used in late 40's and then reintroduced in early 60's to highlight the underlying basic trends in the balance of payments by abstracting from volatile transactions as short-term capital movements and errors and omissions. This idea has been aptly and adequately criticized for the fact the long-run forces can be and often are at variance at reality.

II. Liquidity Balance (B_L)

Liquidity balance consists of basic balance plus short-term net capital flows of the United States and figures under errors and omissions. Formally,

$$B_L = X - M + NUT + K_{ST(U.S.)} + E\&O \equiv - (K_{ST(F)} + NOR \qquad (2.4)$$

where $K_{ST(U.S.)}$ measures movements of U. S. capital and ($K_{ST(F)}$ represents foreign liquid capital, denoting changes of all U. S. short-term liabilities to foreigners and all foreign holdings of U. S. securities irrespective of their maturities. By definition, $K_{ST} \equiv K_{ST(U.S.)} + K_{ST(F)}$. That means, $B_L \equiv B_B + K_{ST(U.S.)} + E\&O$. This measure of balance attempts to define the sum of current account balance, long-term capital movements, changes in U. S. claims against to all foreigners and the errors and omissions as *autonomous* balance and, considers thus the U. S. liquid liabilities to all foreigners and changes in U. S. official reserves position as *accommodating* balance. This balance , originally designed in mid-50's under the leadership of Walter Lederer, the then Chief of the Balance of Payments Division of the U. S. Government, was an attempt to gauge the pressure on U. S. official reserves holdings in case the U. S. dollars needed to be defended in foreign exchange markets. It is now recognized after several formal criticisms that the liquidity balance is not of much utility in the world of complex economic behavior.

III. OFFICIAL-SETTLEMENTS BALANCE ($B_{O\text{-}S}$)

The review Committee for Balance of Payments Statistics under the chairmanship of Edward M. Bernstein to examine the liquidity definition of the U. S. balance of payments and to evaluate the robustness of the framework within which the government can consider policy alternatives defined the Official Settlements Balance ($B_{O\text{-}S}$). It is defined as follows:

$$B_{O\text{-}S} \equiv X - M + NUT\ K_{LT} + K_{ST(U.S)} + K_{ST(FP)} + E\&O \equiv -(K_{ST(FO)} + NOR \quad (2.5)$$

Here, one can see now that $B_{O\text{-}S} \equiv B_L + K_{ST(FP)}$. What is $K_{ST(FP)}$, and what is $K_{ST(FO)}$? $K_{ST(FP)}$ is the short-hand expressions for short-term capital owned by foreign private individuals and corporations, and $K_{ST(FO)}$ stands for short-term capital owned by foreign official institutions such as the foreign central banks and the foreign government treasuries. By definition, $K_{ST(F)} \equiv K_{ST(FP)} + K_{ST(FO)}$. This balance is primarily designed "to measure the gap between the normal supply of and demand for foreign exchange - a gap which the monetary authorities, here and abroad, must fill by adding to, or drawing down, their reserve assets if exchange rates are to be held stable...." It is well established now that view of balance is hardly sounder than the previous ones.

C. BALANCE OF PAYMENTS: EQUILIBRIUM AND DISEQUILIBRIUM

We have already noted that in accounting sense balance of payments always balances.

That is, BOP is always equal to zero. Note that the accounting view of double-entry bookkeeping system of *ex-post* has to make both ends meet. But, in reality, hardly a country is in balance of payments balance - or what economists call balance of payments equilibrium. What is then balance of payments equilibrium? Remember the example of the U. S. exporter selling $400 million worth of rice to a Japanese importer with 30-day credit. We have noted, that by the wizardry of the accounting principle of double-entry bookkeeping, the U. S. balance of payments balances. In reality, the U. S. exporter is ahead of the Japanese importer by $400 million. It is a big liability for that Japanese importer, and needless to say, the U. S. exporter has built an asset of $400 million. In a more broader picture, U. S. economy is wealthier by $400 million, and the Japanese economy is poorer by $400 million. If the same or another Japanese would have sold $400 million worth of electronic parts to a U. S. customer within the same time framework, one can say the trade balances of both the United States and Japan are equal;

U. S. export revenues = Japan's import expenditure, and

U. S. import expenditure = Japan's export revenues.

In this case, both U. S. and Japanese trade balances are in equilibrium. In this example, the United States owes nothing to Japan, and similarly, Japan owes nothing to the United States. But if does not have to cover just merchandise trade. When in a more comprehensive account of balance of payments, all items of receipts in totality of one country matches all items of payments together, the country's balance of payments in balance (equilibrium). So, when

$$BOP \equiv X - M + UT + K_I - K_O + NOR + E\&O = 0,$$

the country is in balance of payments equilibrium (or external equilibrium). The country is in balance of payments deficit if its BOP < 0, and the country is in balance of payments surplus if its BOP > 0. In both situations of deficits and surplus (BOP < 0 or BOP > 0), the country is in what is called balance of payments disequilibrium (or external disequilibrium or imbalance).

Now we will examine what drives different components of balance of payments, and how the governmental policy makers can regulate different facets of external contour of the economic and financial life of an open economy.

C.I: Current Account Balance

Current account balance (CUB), as we have noted already, is:

$$CUB = X - M + NUT,$$

where $X \equiv$ export revenues, $M \equiv$ import expenditure, and $NUT \equiv$ net unilateral transfers. It should be noted now that

$$X \equiv P.\, x(P, e), \quad M \equiv e.P^{*}.m(P, e, Y).$$

Here P stands for domestic price level, P^{*} foreign price level, e the exchange rate (that is, the price of a unit of foreign currency in terms of home currency), Y domestic income level, x volume (that is, quantity) of export, and m volume of import.

C.I(a): Domestic Price, Exchange Rate and Income: Effects

The variables within the parenthesis after x - that is, P, and e refer to the factors that influence export volume (x), and similarly P, e, and Y that appear in the parenthesis after import volume (m) are the factors that affect volume of import of a country. Since there is no parenthesis after NUT, it means that there is no economic factor influencing net unilateral transfers from one country into another country. Now let us understand how those variables presented in the parentheses after x and m affect export volume and import volume of a country. It is simply a common sense to recognize that if domestic price level rises, the country's export volume goes down, and *vice versa*. If exchange rate (that is, the price of a unit of foreign currency in terms of the home currency) rises, the home country's export volume will tend to rise. To understand this, consider first that the price of, say, a British pound is $2, - that is, the exchange rate is 2; at this exchange rate situation, a British tourist will buy one hamburger in Boston which costs $2 or £1 in his own British currency. But if exchange rate changes from 2 to 4 (that is, in the changed situation, the price of a British pound is $4, the British tourist now will realize that his one pound can buy $4 worth of U. S. goods, and that means he can, if he wants to, buy two hamburgers. as the U. S. goods (hamburgers) have become cheaper to him. Note here that a rise in e means a lower value of U. S. currency, dollar (that is a depreciation of dollar). Similarly, a drop in e means an appreciation of dollar, and in the case of e going down, the foreign customer will buy less of U. S. goods. So, it is clear thus that ***if P rises and/or e falls (which signify that U. S. commodity price and/or currency price rises}, U. S. export volume will tend to decrease as a result, and vice versa.*** Next, consider volume of

import (m), which is influenced by domestic price level (P), exchange rate (e), and domestic income level (Y). It is not difficult to recognize that if P rises, import volume will rise as a result. The reason is the following: if domestic price rises, foreign price remaining unchanged, domestic customers will find home goods relatively more expensive and foreign goods relatively less expensive, and thus foreign goods will become more competitive and induce domestic customers to buy more foreign goods. The net effect will be an increase in import volume consequent upon an increase in domestic price. An example may make this point a bit more clear. Consider a hike in the price of Ford XXXX from $14.000 to $24,000, while price of Toyota ZZZ stays at $14,200. Under the changed price condition, many American customers will buy Toyota ZZZ and a very few Japanese customers will buy U. S. Ford XXX, and thus the U. S. import of Japanese merchandise will rise and U. S. export volume will shrink. Next consider the impact of a change in the exchange rate. Once again we start off with the initial rate of exchange as follows: e = 2 (that is, $2 = £1). Suppose at this exchange rate, every thing else remaining the same, an American buyer (Mrs. Jones) with $75 in her purse plans to buy 3 woolen sweaters in London for her children. After finishing her lunch at the cafeteria, when she goes to convert her dollar into pound sterling, she realizes that the exchange rate has already changed from 2 to 3 (which means $3 = £1 now). Under this changed condition, she readily recognizes that $75 in her purse gives her now £25 (not £37.5 which she thought before her lunch she would get), and in view of that realization she now moves to buy only 2 sweaters instead of 3 sweaters. This example makes one point clearly. ***If e goes up (that is, if dollar depreciates) U.S. importers will tend to buy less foreign goods and services, and in the opposite condition in which appreciation of dollar occurs U.S. import volume will tend to rise.***

Next, we examine the effect of income on import volume. It is widely believed and established in economic theory that consumption is a direct function of income. When income rises, consumption rises as a result. Import being part of overall consumption (that is the why we talk of import consumption), import too rises with increase in income. The rate of change in import expenditure with respect to a change in income is called *marginal propensity to import* (μ), and usually it is grater than or equal to zero, but less than one ($1 > \mu \geq 0$).

One might be wondering why we did not put foreign price (P^*) in the parenthesis after m since it should appear as the logical explanatory variable of import volume. The point is absolutely correct. However, in chapter 6, we will point out that purchasing power parity yields that $P = e.P^*$, and so if P, and e are included as the explanatory factors for import volume, there is no need to bring in P^*. Secondly, the explanatory variables introduced in the import and export functions are the ones which the home economy's policy makers may influence directly or indirectly through a policy menu; foreign variables such as foreign price (P^*) or foreign income (Y^*), which could have been put in the parenthesis after x are not within the control set of our policy makers. So, we choose them as parameters, and that is the reason why exclude other factors in the analytical framework in this chapter.

Now, note that $p.x\ (P, e) \equiv X$, which is in dollar denomination. But $P^*.m(P, e, Y)$ is the value of import expenditure, denominated in foreign currency (like pound sterling). So to homogenize the currency denomination we have multiplied $P^*.m(P, e, Y)$ by e, and thus get $e.P^*.m(P, e, Y) \equiv M$ in dollar denomination. The rest of equation (2.2) are all in dollar terms.

C.II: Capital Account Balance:

Capital account balance (CAB) is the measure of net capital inflow (or outflow). It refers to net claims position on financial assets of a country *vis-a-vis* the rest of the world. A resident of one country invests in financial assets such as securities, time deposits, simple lending instruments and so on in another country if he feels primarily that the rate of return overseas is better than that in his own home country. Of course, there are other reasons too, e. g., wider level of investment diversification, safer haven for his money in a foreign country that at economically and politically unstable and volatile home country, and so on. Here, we focus on the financial factor that significantly influence capital flow, and it is the domestic interest rate (r). In reality, it is the spread between home interest rate (r) and foreign interest rate (r^*) that affects the capital inflow and outflow. Since foreign interest rate is not in our control set, we take it as a parameter than as an explanatory variable for our analysis in this chapter. Therefore,

$$CAB \equiv K_I - K_O \equiv K(r).$$

It means that r is the reason for net capital movement. If r rises, *ceteres paribus*, there will be an increase in capital inflow into the country and a decrease in capital outflow from the country, and in the net terms then it will induce an increase in net capital inflow (or a decrease in net capital outflow). In summary, one may note that ***a rise in domestic interest rate induces an improvement in capital account balance, and a drop in the domestic interest rate causes a deterioration in capital account balance.***

C.III: Net Official Reserves:

As already noted in the early part of this chapter, net official reserves are a part of the balance of payments of a country. Each country through its own government holds a pool of funds in the form of a cocktail of different currencies, gold, Special Drawing Rights (SDR). The purpose of this holding is essentially to be able to intervene in currency markets unilaterally or in concert with other nations to stabilize exchange rates and to settle some official accounts.

C.IV: Errors and Omissions:

Balance of payments being an accounting statement, debit must balance with credit. Yet, because of recording errors and missing items in the accounting, there exists a gap between debit and credit at a point of time and also for a period of time. This missing gap, - now a days called in the United States "statistical discrepancy" or "balancing item" in the United Kingdom - is what is widely known as errors and omissions. Given perfection in counting and recording with no lag this entry should be zero. Even otherwise, its magnitude is so tiny compared to the rest of this official receipts and payments, one can may consider it negligible from a practical point of view.

Having examined all major components of balance of payments, it is time to summarize our results as follows:

> ***i. Domestic price inflation, currency appreciation and growth in national income will tend to induce a deterioration in the country's current account balance, and price deflation, currency depreciation, and decline in national***

income will induce an improvement in the country's current account balance. If, any one or two economic conditions move counter to the third economic development, the result is not clear-cut without additional information.

ii. Foreign interest rate remaining unchanged, a rise in domestic interest rate will tend to induce an increase in net capital inflow into the country (or a decrease in net capital outflow from the country).

D. BALANCE OF PAYMENTS EQUILIBRIUM AND MARKET DYNAMICS

We have noted that for all practical consideration BOP = CUB + CAB. CUB is influenced by P, e, and Y, and CAB is influenced by r. Is there any way we can establish a link between (a) r and CUB, and (b) e and CAB? In chapter 6, when we discuss *covered interest parity*, we will show the link between exchange rate and capital flows. However, here we see an opening too by invoking the condition of balance of payments equilibrium (that is, BOP = 0). If BOP = 0, then CUB = - CAB, which we already noted earlier in this chapter. We shall pursue this a little bit more. But before that work, try to see the link between domestic interest rate and home country's current account balance. In basic macroeconomics, the national income accounting provides the following for a country, and here let it be for the home country:

$$Y = C + I + G + X - M \tag{2.6}$$

where

Y ≡ aggregate income;

C ≡ aggregate consumption expenditure;

$I \equiv$ aggregate (private) investment expenditure;

$G \equiv$ aggregate government expenditure;

$X \equiv$ aggregate export earnings;

$M \equiv$ aggregate import expenditure;

The following functional relationships are posited as accepted reality:

$$C = \alpha + \beta.Y, \quad 1 \geq \beta \geq o \tag{2.7}$$

$$I = a + b.\ r, \quad b < 0, \text{ and} \tag{2.8}$$

$$M = \gamma + \mu.Y, \quad \mu \geq 0 \tag{2.9}$$

Here the first relation states that consumption expenditure (C) is an autonomous expenditure (α), which means this much consumption expenditure must be incurred independent of any economic strength plus an induced consumption expenditure ($\beta.Y$), which is directly related to income level. Higher the income, higher this component of consumption expenditure. β here is what economists call 'marginal propensity to consume' (which is defined as the rate of change in consumption expenditure with respect to a change in income, $\partial C/\partial Y$). Marginal propensity to consume lies between zero and 1, - which means that for an extra dollar earned a nation is going to spend at least a fraction of that dollar, but definitely not the entire dollar. The second relation defines the private investment as consisting of some autonomous investment amount (here, a) and an amount, b.r, which varies with interest rate. b being defined negative ($b < 0$), it suggests simply that as r goes down, I (that is, investment expenditure) goes up, and *vice versa*

The reason is obvious. Since interest rate is the cost of capital, a decrease in interest rate triggers a stimulus for further investment project. Next, like consumption expenditure, import expenditure (M) is posited as comprising of two components: autonomous import expenditure γ, and induced import expenditure (μ.Y), which is directly related to income. Higher the income, higher the import expenditure, and *vice versa*. μ is the marginal propensity to import ($\mu \equiv \partial M/\partial Y$).

From these relations, by substituting equations (2.7) through (2.9) in equation (2.6), one can obtain the following:

$$Y = \alpha + \beta.Y + a + b.r + G + X + \gamma + \mu.r \qquad (2.10)$$

whence:

$$Y = \{1/(1 - \beta + \mu)\}.[\alpha + a + G + X + \gamma\} \qquad (2.11)$$

or, alternatively,

$$Y = \{1/(1 - \beta + \mu)\}.[\alpha + a + G + X + I\} \qquad (2.11)^*$$

Allowing change in these variables and denoting that by prefixing Δ before the variable, one can get from equation $(2.11)^*$:

$$\Delta Y = \{1/(1 - \beta + \mu)\}.[\Delta G + \Delta X + \Delta I\} \qquad (2.12)$$

Here $\{1/(1 - \beta + \mu)\}$ is termed the **open economy expenditure multiplier**. What it means is that is any of the expenditures is changed, income will change with the multiplier of $\{1/(1 - \beta + \mu)\}$. Assign some values to these marginal propensities, β and μ. Let $\beta = 0.75$ and $\mu =$

0.10. In that case, open economy multiplier is $\{1/(1 - 0.75 + 0.10)\} = 2.8571$; if propensity to import were zero ($\mu = 0$), it is a case of closed economy multiplier, and its value will be $\{1/(1 - 0.75 + 0\} = 4$. one can see then that open economy multiplier has a leakage, and hence its value is less than that of closed economy multiplier. From equation (2.12), one can now find that if, say, export revenues *alone* are increased, income will increase by the amount $\Delta Y.\{1/(1 - \beta + \mu)\}$. So if ΔX = \$1,000,000, then with this open economy multiplier, national incomes rise by the amount \$2,857,100. Next note here that as income rises by \$2,857,100 (as a result of autonomous increase in export revenues), import expenditure will also rise by $\mu.\Delta Y = (0.10).\$2,857,1000 = \$285,710$, and hence $\Delta X - \Delta M$ = \$1,000,000 - \$285,1000 = \$714,290. What transpire from this simple example is the following: **an autonomous increase in export revenues (maybe, because of heavy export promotion package) will result in an improvement in trade (and current account) balance, even though there will be a drain through an increase in import expenditure.** A close look at equation (2.12) further yields that if domestic investment expenditure is spurred by a decrease in interest rate, national income level is also increased by the same multiplier, and similarly, if a hike in interest rate occurs, investment expenditure drops, and consequently national income decreases by the amount of decrease in invest expenditure *times* the open economy multiplier. Suppose if r drops from 7 percent to 6 percent, investment rises from \$5,000.000 to \$7,500,000, and if r rises from 7 percent to 8 percent, investment falls to \$2,000.000. Given the value of the open economy as 2.8571, a drop of interest rate from 7 percent to 6 percent creates an expansion of national income by \$7,142,750 [$\$(7,500,000 - 5,000,000) \times 2.8571$], and a hike in interest rate from 7 percent to 8 percent causes a drop of national income by \$8,571,300 [= \$(5,000,000 -

2,000,000)×2.8571]. Note one more important point. If domestic interest rate drops, investment is spurred, which in turn, causes an even higher increase income, and that induces an increase in import expenditure. Since home country's export revenues do not depend upon its national income, **a drop in interest rate causes a deterioration in the country's current account balance, and a rise in domestic interest rates causes an improvement in its current account balance**. This result is portrayed in Figure 2.1:

Figure 2.1

On the vertical axis in Figure 2.1, we measure domestic interest rate, and on the right-hand side of the horizontal axis we measure deficit in current account balance [CUB(deficit)] as well as surplus in capital account balance [CAB(surplus)]; on the left-hand side of the horizontal axis, we measure surplus in current account balance [CUB(surplus)] and deficit in capital account balance [CAB(deficit)]. At a constant domestic commodity price (P, say \$2), exchange rate (e, say 2), and national income (Y, say \$50,000 billion), consider r = 7 percent, and the investment expenditure (I) is \$15,000 billion and the current account balance (deficit) is \$2,000 billion; when r = 6 percent, I = \$24,000 billion and current account balance (deficit) is \$5,400 billion, and when r = 8 percent, I = \$11,000 and current account balance (deficit) is \$1,120 billion. When r = 12 percent, current account balance turns into surplus amount of \$978 million. The curve ZZ represents these different levels of current account balance corresponding to different domestic interest rate at given values of P, e and Y (P=\$2, 2 =2, and Y = \$50,000 billion). If e changes from e = 2 to e = 1, current account balance schedule, ZZ will move bodily

upward to the right (as exchange rate appreciation of the home currency will trigger further deterioration in current account balance. The effects of changes in p and Y on current account balance schedule can now be easily ascertained. Next put the capital account balance schedule, YY on this diagram (Figure 2.1), which is obviously upward rising. The intersection of these schedules, YY and ZZ, determine the balance of payments equilibrium, which means CUB + CAB = 0. In this diagram, balance of payments equilibrium occurs at interest equal to OR (= 10%), and at this point the current account balance deficit is OQ and the capital account balance surplus is OQ. If P and/or Y and/or e rise, ZZ schedule move up to the right, and NN schedule remains unchanged, equilibrium interest rate will rise and current account deficit and the matching capital account surplus will rise with it. From this analysis then it follows that r and e move in the same direction by market dynamics. One more observation may be made at this point. If foreign interest rate goes up, then the spread between domestic and foreign interest is narrowed, causing thereupon a net decrease in capital inflow into the home country, which means CAB schedule moves bodily to the left. The end results of such shifts of CAB and CUB can be easily worked out by the interested readers.

E. CURRENT ACCOUNT BALANCE AND CAPITAL ACCOUNT BALANCE: AN ALTERNATIVE APPROACH TO THE RELATIONSHIP

In balance of payments equilibrium, current account balance and capital account balances have already been shown as follows as follows:

CUB = - CAB.

Here, one again, we establish the same relationship in a different way and for emphasising different policy menu for correcting disequilibrium. Consider the following symbols for that purpose:

$Y \equiv$ Aggregate income of the home country;

$E \equiv$ Aggregate expenditure of the home country;

$C \equiv$ Aggregate consumption expenditure of the home country;

$S \equiv$ Aggegate savings;

$I_d \equiv$ Aggregate investment expenditure (domestic);

$I_f \equiv$ Aggregate investment expenditure (foreign);

$G \equiv$ Aggregate government expenditure;

$T \equiv$ Aggregate tax revenues;

$D \equiv$ Aggregate ~~expenditure~~ value of domestic goods are services produced and consumed;

$X \equiv$ Aggregate export revenues;

$M \equiv$ Aggregate import expenditure.

On national income accounting in the Keynesian tradition one gets in a simple structure:

$$Y = C + S \qquad (2.7) \qquad Y = D + X \qquad (2.8)$$

$$E = C + I_d \qquad (2.9) \qquad E = D + M \qquad (2.10)$$

Subtract (2.9) from (2.8), and the subtract (2.10) from (2.8) and obtain the following:

$$Y - E = S - I_d \qquad (2.11) \qquad Y - E = X - M \qquad (2.12).$$

From (2.11) and (2.12) one then finds:

$$S - I_d = X - M \qquad (2.13)$$

In words, excess of savings over domestic investment *equals* excess of exports over imports, which is the current account balance (CUB). Excess of savings over domestic investment is what moves out as overseas investment (I_d), and this what we have recognized as capital outflow or capital account balance (CAB). We have thus innocuously established that CUB = - CAB. Let us draw some diagrams at this point. Since $C = \alpha + \beta Y$, then from relation (2.7), $S = -\alpha + (1 - \beta)Y$. In Figure 2.2(a), we draw savings schedule (S) and domestic investment schedule (I_d) schedule. Subtracting the vertical height of investment schedule (I_d) from saving schedule (S) then we get ($S - I_d$) schedule in Figure 2.2(a). Next, since $M = \gamma + \mu.Y$, and X is independent of domestic income, we draw import (M) and export (X) schedules in Figure 2.2(b). Subtracting import schedule (M) from export schedule exactly in the same way we then get (X - M) schedule, which is also portrayed in Figure 2.2(b).

Figure 2.2

Now, let us put Figure 2.2(a) and Figure 2.2(b) together and get Figure 2.3(a, b, c) under alternative possible scenarios.

Figure 2.3

In Figure 2.3, equality of ($S - I_d$) schedule (that is, excess savings over domestic investment at different possible income levels) and (X - M) schedule (current account balance amounts at different income levels) takes place at OY^*; Figure 2.3(a) shows that at this equilibrium level, current account balance is in surplus (equal to OA dollars). Figure 2.3 (b) portrays zero trade balance at the equilibrium level, and in Figure 2.3(c) we see that equilibrium occurs with current account balance deficit in the amount of OB dollars. Note here we have assumed domestic investment and export as autonomous. A few observations should be in order now.

We already learned that if domestic price (P) is lowered and/or exchange rate (e) is devalued, then export is increased (or in more comprehensive terms, current account balance is improved). Every thing else remaining unchanged, that means a rightward shift of (X - M) schedule in 2.3, which, in turn, implies the overall equilibrium improvement in current account balance and national income. Note here the shift of (X - M) schedule is by JK ($\equiv$ RQ) amount, but the improvement in current account balance is by ZQ ($<$ RQ) amount. The reason is the foreign trade leakage. Because of increase in exports, income goes up, which induces an an increase in imports, and thus cuts into the full gain. In this framework, other policy menu such as savings and domestic investment changes can also be examined. Let us, at this stage bring in government spending and taxes as well. In this more general setting with government spending and taxes, one rewrite the national income and expenditure statements, and come to the following condition of equilibrium:

$$X - M = (S - I_d) - (G - T) \qquad (2.17)$$

Here government budget deficit (if G > T) or surplus (if G < T) is included in the picture. Let us exhibit the government expenditures (G) and tax revenue (T as a propotion of national income) in Figure 2.4. Here G is assumed autonomous, and T = τ.Y (where τ is the income tax rate). Combining G schedule and T schedule together we get (G - T) schedule (and its mirror image - (G - T) in the same diagram. Note now that for all income levels until OY_a government expenditure is more than taxes (that is, G - T is positive), and that is depicted by the downward-sloping (G - T) schedule (or, alternatvely by the upward-sloping - (G - T) schedule in Figure 2.4. In Figure 2.5, we put (S -I_d) and -(G - T) schedules first, and get (S - I_d) - (G - T) schedule. Now superimpose (X - M) schedule of Figure 2.3 on this Figure 2.5. Here we note that (S - I_d) - (G - T) intersects (X - M) schedule at income level OY_b. At this level, current account balance is in deficit in the amount of Y_bF_b dollars, and, as Figure 2.4 shows, government budget deficit is in the amount of Y_bG_b. This is the current picture of the U.S. economy. What policy choices do you have to correct these problems? One can see through this diagram that if government budget deficits are reduced by either government spenditing cut or by a mix of government spending cut and some increase in tax revenues, (S - I_d) - (G - T) schedule will move to upward to the left, which will reduce both deficit (or may even turn both deficits into surplus). On top of this medicine, government and policy makers can through exchange rate policy manipulation (currency devaluation) and reduction in domestic inflation help shift the (X - M) schedule upward to the right. One of the possible scenarios is captured by this diagram, and it is a case of surplus on both fronts: surplus in current account balance and surplus in government budget. Many other situations can be examined through this framework, and here we ask students to do those exercises.