Chapter 1
Introduction

International macroeconomics and finance deals with the determination of economic and financial aggregates in economies, linked through international trade in goods and services, flows of labour and capital, and participation in global financial markets. Such economies are called *open economies*.

One fundamental difference between open and closed economies is that open economies can borrow resources from the rest of the world or lend resources to the rest of the world . Thus, in an open economy, domestic investment can differ from national savings. This possibility of transferring savings from country to country is called *inter-temporal trade*, and is the first main distinguishing feature of international from closed economy macroeconomics. A large part of international macroeconomics and finance deals with the *balance of payments*, which is associated with this inter-temporal trade. In particular it deals with the financial implications of the balance of payments and with how the balance of payments and its financing affects other macroeconomic aggregates, such as output and employment, economic growth, employment and unemployment, inflation, private consumption and investment, interest rates and wages.

A second key difference between open and closed economies is that the global economy is using several currencies, and not just one. These currencies are issued by national authorities, and not some supranational authority which can impose their use by government fiat. The relative prices of these currencies, *exchange rates*, are constantly changing in the current international monetary and financial system, and they display high volatility. Fluctuations in exchange rates affect all macroeconomic aggregates. A large part of international macroeconomics deals with the determinants and the effects of changes in exchange rates, and the pros and cons of alternative exchange rate regimes.

A third issue, related to the second, is that some currencies are more equal than others in the international economy. Since the use of international currencies cannot be imposed by government fiat, only a few currencies, such as the dollar, and to a lesser extent, the euro and the yen, are widely acceptable in international financial transactions. Such currencies, often called *international vehicle and reserve currencies*. They serve as means of payments, units of account and stores of value, in all international financial transactions, even in transactions between countries other than the country issuing them. This feature, which creates asymmetries in the international monetary system, is also a key concern of international macroeconomics and finance.

A fourth key concern of international macroeconomics and finance is the structure, role and the implications of international financial markets. In all economies, the role of capital and money markets is extremely important. Capital and money markets allow households and businesses to engage in inter-temporal trade, by exchanging securities of different maturities and with different risk characteristics. International capital and money markets differ from domestic ones in at least

three respects. First, the securities traded in international capital markets have been issued in different countries and may be denominated in different currencies. Second, trading in international financial markets is not subject to the same set of rules as the one applicable in national economies. Third, international financial markets display the same asymmetries as those that characterize the international monetary system, in that they are concentrated in a few economies and trades are carried out through international vehicle and reserve currencies. Interest rates and exchange rates are determined in those international financial markets, which thus connect macroeconomic developments in a particular country with the rest of the world .

The role of international money and capital markets is crucial for the global economy. The volume of transactions in those markets far exceeds the volume of international trade. Critical variables for the global economy, such as interest rates and exchange rates are determined through trading in the international money and capital markets, in which both private enterprises and banks and governments take part.

The distinction between *internal* and *external balance* is also central in the field of international macroeconomics and finance. Internal balance is usually defined as a situation of non-inflationary growth and low unemployment. External balance requires a course for the balance of payments and external debt which does not threaten a country's ability to service its international obligations. There exist important tradeoffs between internal and external balance. Because the mechanisms that determine the nature of economic interactions in open economies, such as the rules and institutions of the international monetary and financial system, vary between historical periods, the tradeoffs between internal and external balance may also differ across periods.

A large part of international macroeconomics and finance examines the market forces and policies that result in internal and external balance under different international economic conditions and alternative international financial and monetary systems . The history of international macroeconomics and finance reflects the changing nature of the rules and institutions of the international monetary and financial system, as a result of national and supranational efforts to deal with international economic and financial linkages and external constraints.

This book is dedicated to the analysis of open economies and the global economy, through the lens provided by international macroeconomics and finance. In this introductory chapter we shall start with a few definitions, and then describe the interactions between changes in the international monetary and financial system and the evolution of international macroeconomics.

1.1 National Income Accounting in an Open Economy

A basic understanding of national accounts identities in an open economy is a prerequisite for any discussion of international macroeconomics and the concept of external balance.

There are three main points that need to be clearly understood concerning national income accounting in open economies.

First, the relationship between domestic income, domestic spending and the trade balance. This allows to understand that external imbalances, such as trade and current account deficits are macroeconomic in nature, as they reflect the difference between domestic spending and domestic income.

Second, the relationship between the trade balance, the fiscal balance and the balance of private savings and investment. This allows to understand that external imbalances, such as trade and current account deficits, are due to two internal imbalances. The difference between government revenue and expenditure, and the difference between aggregate private savings and investment. are macroeconomic in nature, as they reflect the difference between domestic spending and domestic income.

Thirdly, the distinction between Gross Domestic Product (GDP) and Gross National Product and Income (GNP or GNI). GDP is the total value of goods and services produced in a particular economy, while GNP is the total value of the income of residents in a particular country. The difference between the two is net income paid out to the rest of the world.

In an open economy, total GDP is equal to the sum of private consumption, private investment, government expenditure and exports, minus imports. The value of imports has to be subtracted because part of domestic consumption, investment and government expenditure is on imported and not on domestically produced goods. In addition, the value of exports encompasses imported raw materials and imported intermediate goods and services.

Thus, the national income identity in an open economy takes the form,

$$Y = C + I + G + (X - M) \tag{1.1}$$

where Y denotes Gross Domestic Product (GDP), C aggregate private consumption, I aggregate private investment, G government expenditure, X exports and M imports.

Aggregate Gross Domestic Expenditure, which is the expenditure of domestic residents on final goods, and which sometimes is called *absorption*, is equal to,

$$E = C + I + G \tag{1.2}$$

From (1.1) and (1.2),

$$Y = E + (X - M) \tag{1.3}$$

The *trade balance,* or *net exports X-M*, is by definition equal to the difference between Gross Domestic Product and Gross Domestic Expenditure. (1.3) can be re-written as,

$$Y - E = X - M \tag{1.4}$$

The trade balance is merely the difference of gross domestic product and expenditure. This is a very important observation because it directs our attention to the macroeconomic nature of external imbalances. The correction of external imbalances, i.e positive or negative trade balances, requires measures to restore the relationship between domestic income and domestic expenditure.

One can analyze this connection to an even greater depth by subtracting from both sides of (1.1) *total taxes T*, and adding to both sides *net income from the rest of the world R.*

$$Y + R - T = C + I + (G - T) + (X + R - M) \quad (1.5)$$

The left hand side of (1.5) measures *Gross National Disposable Income*, while the right hand side measures the sum of *private expenditure* $C + I$, the *fiscal deficit* $G - T$, and the *current account of the balance of payments* $X + R - M$.

The current account is defined as the trade balance plus net income from the rest of the world.

(1.5) can be written as,

$$X + R - M = S - I + (T - G) \quad (1.6)$$

From (1.6), the *current account* is by definition equal to the sum of the *difference between national private savings and domestic investment* $(Y+R-T-C)-I=S-I$ and the *fiscal balance* $T-G$.

While equation (1.4) directs our attention to the fact that external imbalances are of a macroeconomic nature (difference between domestic income and expenditure), equation (1.6) highlights that external imbalances are due to two factors:

A. The difference between national savings and domestic investment of the private sector.
B. The fiscal balance.

Thus, in order to correct external imbalances, a country must either adjust the difference between national private savings and domestic private investment, or the fiscal balance, or both.

To the extent that a country has non zero net income from abroad R, we distinguish between Gross Domestic Product (GDP) and Gross National Product (GNP) or, equivalently, Gross National Income (GNI).

GDP is the value of domestic production and income, and GNI (GNP) the total income of the country's inhabitants. Net income from the rest of the world can be either net income from capital (interest and dividends), or net income from labor (labor supply of domestic residents to the rest of the world).

When we come to issues of asset accumulation from the rest of the world and external debt, this distinction between GDP and GNP becomes central, as asset accumulation vis-a-vis the rest of the world implies differences in net income from capital from the rest of the world.

In absolute terms, the current account is equal to the *capital account*. When the current account is in surplus the capital account is in deficit, i.e, there is accumulation of assets (capital) vis-a-vis the rest of the world. If the current account is in deficit, the capital account is in surplus, i.e. there is a de-cumulation of assets vis-a-vis the rest of the world, or a buildup of external debt.

Figure 1.1 depicts the current account of the USA since the first quarter of 1960, while Figures 1.2 and 1.3 depict the current account of the Eurozone and Japan respectively. Current accounts are measured as a percentage of GDP, so that they are compared with the size of each economy.

As one can see the US current account has been continuously in deficit since the early 1980s. The current account of the Eurozone was in deficit for a few years after the euro was created, but has since moved into a substantial surplus. The current account of Japan has been in surplus for many years. Explaining the causes as well as the implications of such different current account experiences is one of the most challenging tasks of international macroeconomics and finance.

1.2 Nominal and Real Exchange Rates

We next turn to some definitions concerning *exchange rates,* i.e. the relative prices of the currency of one country relative to the currencies of other countries.

We shall define the *bilateral nominal exchange rate* (S) as the value of the domestic currency in terms of a foreign currency.

Thus, S = 0.90 €/$ means that it takes 0.90 euros (€) for the purchase of one US dollar ($). If the rate changed to 0.92, then we say that the dollar has *appreciated* against the euro. An appreciation of a currency is equivalent to a depreciation of the currency against which it is measured. Hence, an appreciation of the dollar against the euro is equivalent to a depreciation of the euro against the dollar.

Accordingly, we shall define the *bilateral real exchange rate* (Q), as the ratio of the price levels of two countries expressed in a common currency.

Thus, if P is the price level in the USA, expressed in US dollars, and P^* the price level in the Eurozone, expressed in euros, the real bilateral exchange rate between the € and the $ is defined as,

$$Q = S(P/P^*) \tag{1.7}$$

Note that the real exchange rate as defined in (1.7) refers to real Euros per dollar. It is the price level in the USA expressed in Euros, relative to the price level in the Eurozone. If the real exchange rate of the dollar goes up, there is a real appreciation, which means that US goods have become more expensive relative to Eurozone goods, when both are measured in a common currency. The opposite happens when there is a real depreciation.

Bilateral exchange rates are defined for pairs of currencies. Exchange rates of a currency can also be defined against more than one other currency. These are called *effective exchange rates*.

We shall define the *nominal effective exchange rate* S_E, as the weighted average of the bilateral nominal exchange rates of a currency, against the currencies of all countries with which the country that issues the currency in question has international transactions. The weights depend on the share of international transactions of the country with each of its trading partners. Thus, the nominal effective exchange rate is defined as,

$$S_E = \pi_1 S_1 + \pi_2 S_2 + ... + \pi_N S_N = \sum_{i=1}^{N} \pi_i S_i \tag{1.8}$$

where, $\sum_{i=1}^{N} \pi_i = 1$

S_i is the bilateral nominal exchange rate of the country with country *i,* and π_i is the share of the international transactions of the country with country *i.*

Accordingly, we shall define the *real effective exchange rate* Q_E, as the weighted average of the bilateral real exchange rates of a country, against the currencies of all countries with which it has international transactions. The weights depend on the share of international transactions of the country with each of its trading partners. Thus, the real effective exchange rate is defined as,

$$Q_E = \pi_1 Q_1 + \pi_2 Q_2 + ... + \pi_N Q_N = \sum_{i=1}^{N} \pi_i Q_i \qquad (1.9)$$

where, $\sum_{i=1}^{N} \pi_i = 1$

Q_i is the bilateral real exchange rate of the country with country *i,* and π_i is the share of the international transactions of the country with country *i.*

The advantage of effective exchange rates over bilateral exchange rates, is that they measure the relative price of the currency of a country vis-a-vis all the countries with which the country in question has international transactions, and not only one. Hence, effective exchange rates are better measures of the overall competitive position of an open economy, as they measure the nominal and real value of its currency against all of its trading partners, and not only one.

Figure 1.4 depicts monthly data for the nominal and real effective exchange rate of the US dollar, against the other major currencies, from January 1973 until November 2016. 1973 was the year when the current exchange rate regime of floating exchange rates among the major currencies was adopted.

The first striking characteristic of the dollar exchange rate is the large volatility and the large cyclical fluctuations that characterize its behavior over time. A second characteristic is the very high correlation of fluctuations of the nominal and the real exchange rate of the dollar against the other major currencies.

Explaining the determination of exchange rates and their implications for macroeconomic outcomes is one of the most demanding tasks of international macroeconomics and finance.

1.3 Monetary Policy and the Trilemma of Open Economies

As exchange rates are the relative prices of currencies, they are affected by the monetary policies of the respective countries. National monetary policies are conducted through central banks, which are government agencies responsible for the management of the domestic monetary system.

Central banks usually have the monopoly of issuing notes and coins, they are responsible for the control of the money supply and nominal interest rates, and for implementing the monetary and financial policy of a country.

The *monetary liabilities of a central bank* constitute the so called *monetary base*. The monetary base consists of notes and coins issued by the central bank, the reserves of commercial banks and deposits of commercial banks with the central bank.

On the other hand, the *monetary assets of a central bank* (assets) are of two types: credit to the domestic private and public sectors, called *domestic credit*, and *net foreign assets*, i.e net receivables from the rest of the world. The latter are the foreign exchange reserves of the central bank, net of the foreign exchange reserves of central banks in the rest of the world in local currency. Foreign exchange reserves include notes and coins in foreign currency, bonds and Treasury bills denominated in foreign currency and precious metals such as gold.

The assets of a central bank are by definition equal to its liabilities. Therefore,

$$B = DC + NFA^{cb}$$

where B is the monetary base, DC is domestic credit and NFA^{cb} are net foreign assets of the central bank.

The central bank can only affect the monetary base, and through the monetary base it can affect the money supply, in either of two ways: First through changes in domestic credit and, second, through changes in net foreign exchange reserves. The first takes place through *open market operations* in the *domestic money market* (domestic securities transactions), where the central bank exchanges securities such as bonds for money, while the second requires *interventions in the foreign exchange market*.[1]

The ability of the central bank of a country to pursue an independent monetary policy differs depending on the exchange rate regime and the regime of international capital mobility.

When there is free mobility of capital, the central bank has two alternative options. It can either let the exchange rate vary freely, opting for *flexible* or *floating exchange rates*, without intervening in the foreign exchange market, or it can make interventions in the foreign exchange market, opting for *fixed* or *managed exchange rates*. In the latter case, it transpires that the central bank cannot pursue an independent monetary policy, as monetary policy is devoted to managing the exchange rate, through interventions in the foreign exchange markets.

To enable a central bank to pursue an independent monetary policy under a regime of fixed or managed exchange rates, the country must impose restrictions on capital movements (capital controls).

This problem is usually referred to as the *trilemma of open economies*. Among the three options of, 1. Fixed (or Managed) Exchange Rates, 2. An Independent National Monetary Policy, and, 3. Free International Mobility of Capital, only two are available for any particular country. All three options are simultaneously incompatible.

Thus a country may choose to have,

A. Fixed (or Managed) Exchange Rates and Free Capital Mobility, but then it will have to accept that it cannot have an Independent Monetary Policy.

[1] On the relation between the monetary base and the money supply, see Chapter 3.

B. An Independent Monetary Policy and Free Capital Mobility, but then it will have to accept Flexible (or Floating) Exchange Rates.
C. Fixed (or Managed) Exchange Rates and an Independent Monetary Policy, but then it will have to impose Capital Controls, as it cannot have Free Capital Mobility.

These are the only three options available, hence the use of the term *trilemma.* We shall demonstrate how the trilemma arises, once we examine the relation between domestic money markets and foreign exchange markets under perfect capital mobility.

1.4 The International Monetary System

International payments, capital movements, national monetary policies and exchange rates are linked through the international monetary system.

The international monetary system is a set of internationally accepted rules, conventions and supporting institutions, that facilitate international trade, cross border financial flows, and generally the reallocation of capital between nation states. It provides means of payments acceptable between buyers and sellers of different nationality, including means of deferred payment, i.e less liquid international assets and liabilities.

To operate successfully, the international monetary system needs to inspire confidence, to provide sufficient liquidity for fluctuating levels of trade and to provide means by which global imbalances can be financed and corrected.

International monetary systems can develop organically, as the result of individual or collective agreements between countries and other international economic actors, spread over several decades, or they can arise from a single architectural vision and international agreement, as happened at Bretton Woods in 1944.[2]

Some of the most critical institutions and rules concerning international monetary systems and the correction of external imbalances are,

A. Whether international trade in goods, services and capital is free.
B. How international transactions are settled and what are the internationally accepted means of payments.
C. Whether the system is based on precious metals or not.
D. Whether exchange rates are fixed or flexible.
E. Whether the system is symmetric or asymmetric regarding the role of particular countries or currencies.

Obviously, the above list is not exhaustive.

1.4.1 International Currencies

Unlike transactions within the boundaries of a given state, in international economic transactions there is no single government that can impose the use of a single currency. Thus, the global

[2] For a detailed history of the evolution of the international monetary system see Eichengreen (2008).

economy ends up with a *plurality of currencies*, although usually only a few of them are fully acceptable internationally. Thus, only a few currencies are used as international units of account, international means of payment and international stores of value. Perhaps one of the most important lessons of international monetary history is that the world almost never ends up with a single international currency. Usually there are more than one internationally accepted currencies. On the other hand, although competition among currencies does not result in the emergence of a single international currency, a situation that would imply the lowest possible transaction costs, some international currencies tend to become dominant relative to the others.

The international monetary system today is basically *tripolar*, with a dominant role for the US dollar ($). The other two major currencies are the Euro (€) and the Japanese Yen (¥). In addition, the pound sterling (£), the Swiss franc and, lately, the Chinese renmimbi (yuan), are also international currencies to some degree.

The US dollar remains the dominant international currency for about a century. It is the major unit for pricing international imports and exports, and is widely used in financial markets and foreign exchange interventions by most central banks. The US dollar is thus considered as the major international *reserve and vehicle currency*. It is not only used in transactions involving the USA, but in many transactions between countries other than the USA.

The international monetary system is thus almost always *asymmetric*. Not all currencies are equal. Usually, one or a few currencies dominate as international currencies. Such currencies are typically issued by large or extremely open economies, with a significant share in international trade and international portfolios of assets. Apart, from the US dollar, the international dominance of which was established after World War I, another historically dominant such currency was sterling, during the period of the international gold standard (1880-1914).

1.4.2 Convertibility

An important set of rules of an international monetary system is the set of rules about *currency convertibility*. Convertibility is the quality that allows money or other financial instruments to be freely converted into other liquid stores of value. Convertibility is an important consideration in international exchanges, where instruments valued in different currencies must be exchanged. Before World War I convertibility was defined in terms of precious metals, such as gold or silver. The world was essentially on a metallic monetary standard, and banknotes were convertible to precious metals. After World War I, convertibility of a currency is defined relative to other currencies, and in particular relative to the dominant international reserve currency, i.e. the dollar, and not necessarily in relation to gold. Over particular periods, usually periods of war or financial turbulence, there have also been restrictions to international capital movements, which meant that convertibility was restricted.

If the dominant international reserve currency is convertible into a precious metal such as gold, the international monetary system is considered to be based on a *metallic standard*. The international monetary system was based on a metallic standard until 1968. In that year the USA abolished the convertibility of the dollar into gold at a fixed price of $35 per ounce, resulting in a de-linking of the international monetary system from gold.

14.3 Exchange Rate Regimes

Another critical characteristic of an international monetary system is the *exchange rate regime*. Until the 1870s, the main advanced economies were either on a silver standard or a gold standard. Because the relative price of gold and silver was stabilized through the interventions of the Banque de France, this system of *bimetallism* was essentially a fixed exchange rate regime. Between 1879 and World War I, the major economies adopted a system of *fixed exchange rates* based on gold. This system, which is known as the *international gold standard*, could not be fully restored in the interwar period, where a number of different monetary and exchange rate regimes prevailed, resulting in international monetary instability. Between the end of World War II and 1973, the main industrial countries operated a system of fixed but adjustable exchange rates, the *Bretton Woods system,* agreed upon in an international conference in 1944. In fixed exchange rate regimes, the required level of cooperation between central banks and governments is high, as it requires coordination of monetary, and budgetary policies in order to maintain and operate the system.

From 1973 until today, the USA, the economies of the European Union, Japan, the United Kingdom, Canada and others have chosen free capital mobility, and domestic, or, in the case of the Eurozone regional, monetary autonomy, resulting in a system of *flexible exchange rates* among the currencies of the major industrial economies.

Yet, the current system is not a system of purely floating exchange rates. Of the 188 member countries of the International Monetary Fund (IMF), only 29 report that they adhere to a free floating exchange rate regime. These include the United States, the 19 member countries of the Euro area, who have adopted a single currency, Japan, the United Kingdom and Canada. They also include Sweden, Norway and Poland, Australia, Mexico, Chile and Somalia. Another 36 IMF members report a floating exchange rate regime, but this is not a *free* floating regime. The remaining 123 IMF member countries have opted for a variety of fixed or managed exchange rate regimes. 43 countries manage their currency against the US dollar, and 26 against the Euro, with the remainder following alternative arrangements and domestic monetary policy targets. Emerging economies such as China, India, Brazil, Russia and South Africa (BRICS) have not opted for free floating, although they have adopted floating or managed exchange rate regimes that also rely on capital controls.[3]

Between 1978 and 1999, the major economies of the European Union had opted for a system of fixed but adjustable exchange rates between their currencies, the European Monetary System (EMS). The EMS was characterized by free capital mobility. Thus, these European economies had given up domestic monetary autonomy, closely coordinating their monetary policies. Since 1999, this system was transformed into a single currency area, as the economies of the Eurozone have opted for a single currency, the euro, and a common monetary policy.

On the other hand, as already mentioned, China has chosen capital controls in order to combine managed exchange rates with domestic monetary autonomy.

Thus, in the current international monetary system, different economies have opted for different solutions to the trilemma of open economies, although the major industrial economies, such as the USA, the Euro Area, Japan, the United Kingdom and Canada have opted for a system of fully

[3] For an analysis of current exchange rate regimes see Klein and Shambaugh (2010). For the most recent global exchange rate arrangements and exchange rate restrictions see International Monetary Fund (2014).

flexible exchange rates, perfect capital mobility and domestic, or, in the case of the Eurozone, regional, monetary autonomy.

1.5 The International Monetary System and the Evolution of International Macroeconomics

The changing nature of the international monetary system is closely linked to developments in international macroeconomics.

During the period of bimetallism, before the 19th century, the classical analysis of the adjustment of the balance of payments was the *price-specie flow mechanism* developed by Hume (1752). Hume assumed a global economy where external imbalances are settled solely through imports or exports of precious metals, which played the role of money. Building on the quantity theory of money, he developed a full dynamic model of the balance of payments and the terms of trade. The price-specie flow mechanism was an almost automatic market process, which equilibrated the balance of payments. The goal of Hume was to overturn the notions of the mercantilists, showing that protectionism is not necessary, as market forces would, under appropriate monetary rules, ensure the "natural" distribution of precious metals among different countries in the long run.

1.5.1 Hume and the Price-Precie Flow Mechanism

Hume urged his readers to reflect on what would happen if four fifths of the money supply of Great Britain "disappeared in one night". He argued that prices in Britain would fall, making British exports more attractive and imports more expensive. This would create a trade surplus, and import of precious metals into Britain. Gradually the money supply and prices in Britain would begin to rise, and prices in the rest of the world to fall. The trade surplus in Britain would gradually fall, until the current account would return into balance, through the equalization of prices between Britain and the rest of the world.

This analysis of Hume dominated the way economists approached the problem of the adjustment of the balance of payments throughout the 19th century and the early 20th century. During the period of the dominance of bimetallism and the international gold standard, this approach was the only theoretical approach to the problem of "external balance". In the interwar period, this approach remained dominant for a time, despite the fact that the monetary system had changed and central banks did not respect the rules of the international gold standard, using interest rates in order to affect international capital flows and exchange rates. Gradually, due to the failure of the return to the gold standard and due to the Great Depression of the 1930s, the emphasis shifted to the interaction between external and internal balance (see Nurkse 1944). Many governments resorted to competitive devaluations and trade barriers, with the aim of tackling domestic unemployment. These uncoordinated "beggar thy neighbor" policies reduced prosperity in all countries.

After the Second World War and the creation of the Bretton Woods system, a new international institution, the International Monetary Fund, was given the task to reconcile the objectives of internal and external balance. In the environment of fixed exchange rates envisaged in the Bretton Woods system, and given the low international mobility of capital, the main objective of governments, in countries other than the USA, was to have sufficient foreign exchange reserves, mainly in dollars, in order to finance current account deficits and support the exchange rate of their currency. As issuer of the dollar, the US had a significant advantage, as it could finance its own current account deficits by issuing its own domestic currency, the dollar. This of course could happen only as long as the USA

could guarantee that the price of gold in dollars would remain unchanged at $35 an ounce, as was envisaged by the Bretton Woods system (see Triffin 1960).

1.5.2 The Keynesian Approach to International Macroeconomics

International macroeconomics shifted to the Keynesian approach, combined with assumptions reflecting the new institutional framework of the Bretton Woods system. The main assumption underlying international macroeconomics was the short run rigidity of wages and prices, a key element of the theory of Keynes (1936). Keynesian models relied on this assumption, in conjunction with the assumption of fixed but adjustable exchange rates, a key element of the Bretton Woods system.

The original Keynesian models (Metzler 1948) ignored the monetary dimension of external imbalances. Given the assumption of low international mobility of capital, inadequate adjustment in the current account would lead to changes in the foreign exchange reserves of central banks. This would have monetary consequences. However, early Keynesian models, explicitly or implicitly, assumed that central banks could offset the monetary effects of changes in foreign exchange reserves.

The main difference of the keynesian approach from the analysis of Hume, was that in keynesian models there was no automatic external adjustment mechanism through changes in the price level. If through the use of aggregate demand policies there appeared to be a conflict between internal balance (high employment) and external balance (low current account deficits), then the only solution appeared to be a discrete devaluation. This was recognized in the Articles of Agreement of the IMF, which, when the Bretton Woods system of fixed exchange rates was in force, allowed for devaluations in cases of a "fundamental disequilibrium" in the balance of payments.

The most complete keynesian analysis of the twin problems of internal and external balance was presented by Meade (1951). This approach was comprehensive, and did not ignore monetary factors. It dominated international macroeconomics and macroeconomic policy until the early 1960s.

In the early 1960s, in a series of important papers, Mundell showed that even in the keynesian model, when allowing for monetary factors and capital mobility, there are combinations of monetary and fiscal policies that could simultaneously achieve internal and external balance (see Mundell 1961). This class of keynesian models with high capital mobility is known as the Mundell-Fleming model. Mundell showed that when there is high international capital mobility, as appeared to be the case between industrial economies after 1958, monetary policy could be used to achieve external balance, while fiscal policy could be targeted to internal balance. The reason is that a monetary expansion lowers domestic interest rates, causing international capital outflows, while a fiscal expansion raises domestic interest rates, causing international capital inflows. Combining the two policies, a country could achieve a combination of changes in income and in nominal interest rates that would result in both internal and external balance.

The analysis of Mundell, although significant for the short run, suffered from the fundamental weakness of keynesian models. The exclusive focus on the short run, and the lack of connection between stocks and flows. A policy of permanently maintaining high interest rates in order to attract foreign capital to finance external imbalances would lead to a reduction of investment and the accumulation of external debt. Thus, it could not be regarded as satisfactory, or sustainable in the long run. Eventually, the reduction in investment would result in lower long run growth, and the accumulation of external debt would create a confidence crisis and a pressure to devalue.

Like the international gold standard, the Bretton Woods system eventually collapsed due to the need of the central pillar of the system, the USA in this case, to resort to monetary financing of budget deficits, thus loosening the connection of the dollar to gold. In addition, other countries had significant difficulties in maintaining fixed exchange rates, and often devalued. Thus the system of fixed exchange rates was destabilized, and, in 1973, the international monetary system shifted to a regime of floating exchange rates among the major currencies.

The main argument of supporters of floating exchange rates was that it would automatically lead to external balance, and, hence, independent monetary policies in each country could be used to achieve internal balance. This analysis in favor of flexible exchange rates existed since the 1950s, in an important article by Friedman (1953), and had been adopted in the late 1960s by Johnson (1969).

1.5.3 The Monetary Approach to the Balance of Payments and Exchange Rate Determination

With the adoption of flexible exchange rates, the emphasis in international macroeconomics shifted towards the question of whether exchange rate adjustments would automatically lead to external balance. One approach was the monetary approach to the balance of payments and the exchange rate (see Frenkel and Johnson 1976, Dornbusch 1976) and a second approach was broader and was based on portfolio balance models (see Obstfeld and Stockman 1985). The dynamic adjustment mechanism of the current account in portfolio balance models is triggered by total wealth, which includes not only currency, but international securities and possibly physical and human capital.

Both monetary and portfolio models of the 1970s were based on rational expectations, incorporating one of the broader developments in macroeconomics at the time. A natural development of these models, and of the rational expectations hypothesis, was the inter-temporal analysis of external balance (see Obstfeld and Rogoff 1996). This assumes that households and businesses maximize their inter-temporal utility subject to inter-temporal budget constraints (see Ramsey 1928 and Fisher 1930).

1.5.4 The Inter-temporal Approach to External Balance

The inter-temporal approach starts by identifying the technological and market possibilities of an economy to choose the time path of aggregate consumption and investment. These possibilities are described by the inter-temporal budget constraint, which describes the conditions under which the economy can lend and borrow internationally, as well as the domestic investment technology. Separate analysis of the budget constraints of the public and the private sector illuminates the relationship between public finance and external balance.

This approach is currently the dominant theoretical approach to international macroeconomics and is widely used for the analysis of the external balance and international imbalances, policy coordination, external debt and the operation of international capital markets. It combines the short run with the long run without the schizophrenic dichotomy that characterized macroeconomics before its adoption.

However, this approach, although theoretically more satisfactory than previous approaches, is technically much more demanding and difficult to work through. Applied macroeconomists still apply keynesian models for the short run, and classical models for the long run, without necessarily keeping full track of the transition from the short run to the long run, as the inter-temporal approach would

require. This is by and large the approach taken in this book, although we shall be alluding to inter-temporal approach when discussing inter-temporal issues.

1.6 Conclusions

In this introductory chapter we have provided an introduction to international macroeconomics and finance.

We have defined key concepts such as the trade balance and the current account, and their relation to other macroeconomic variables. We have introduced alternative definitions of exchange rates, such as nominal and real exchange rates and bilateral and effective exchange rates. We have discussed the key characteristics of international currencies and the international monetary system. Finally, we have provided a short introduction to the development of theories of international macroeconomics and finance.

In the next chapter we start by reviewing the key characteristics of international financial markets, which provide a key link among open economies.

References

Dornbusch, R. (1976), "Expectations and Exchange Rate Dynamics", *Journal of Political Economy*, 84, pp. 1161-1176.

Eichengreen B. (2008), *Globalizing Capital: A History of the International Monetary System*, (2nd Edition), Princeton N.J., Princeton University Press.

Fisher I. (1930), *The Theory of Interest*, New York, Macmillan.

Frenkel J.A. and H.G. Johnson (eds.) (1976), *The Monetary Approach to the Balance of Payments*, London, Allen and Unwin.

Friedman M. (1953), "The Case for Flexible Exchange Rates", in his *Essays in Positive Economics,* Chicago, University of Chicago Press.

Hume D. (1752), "On the Balance of Trade", in his *Essays, Moral, Political and Literary,* London, Longmann Green.

International Monetary Fund (2014), *Annual Report on Exchange Rate Arrangements and Exchange Rate Restrictions,* Washington D.C.

Johnson H. G. (1969), "The Case for Flexible Exchange Rates", *Federal Reserve Bank of St Louis Monthly Review,* 51 (6), pp. 12-24.

Keynes J.M. (1936), *The General Theory of Employment, Interest and Money,* London, Macmillan.

Klein M.W. and Shambaugh J.C. (2010), *Exchange Rate Regimes in the Modern Era*, Cambridge Mass., MIT Press.

Meade J. (1951), *The Balance of Payments*, London, Oxford University Press.

Metzler L.A. (1948), "The Theory of International Trade", in H.S. Ellis (ed), *A Survey of Contemporary Economics,* Philadelphia, Blakiston.

Mundel R.A. (1961), "The International Disequilibrium System", *Kyklos,* 14 (2), 153-72.

Mundell R. A. (1963), "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates", *Canadian Journal of Economics,* 29 (4), pp. 475-485.

Nurkse R. (1944), *International Currency Experience,* Geneva, League of Nations.

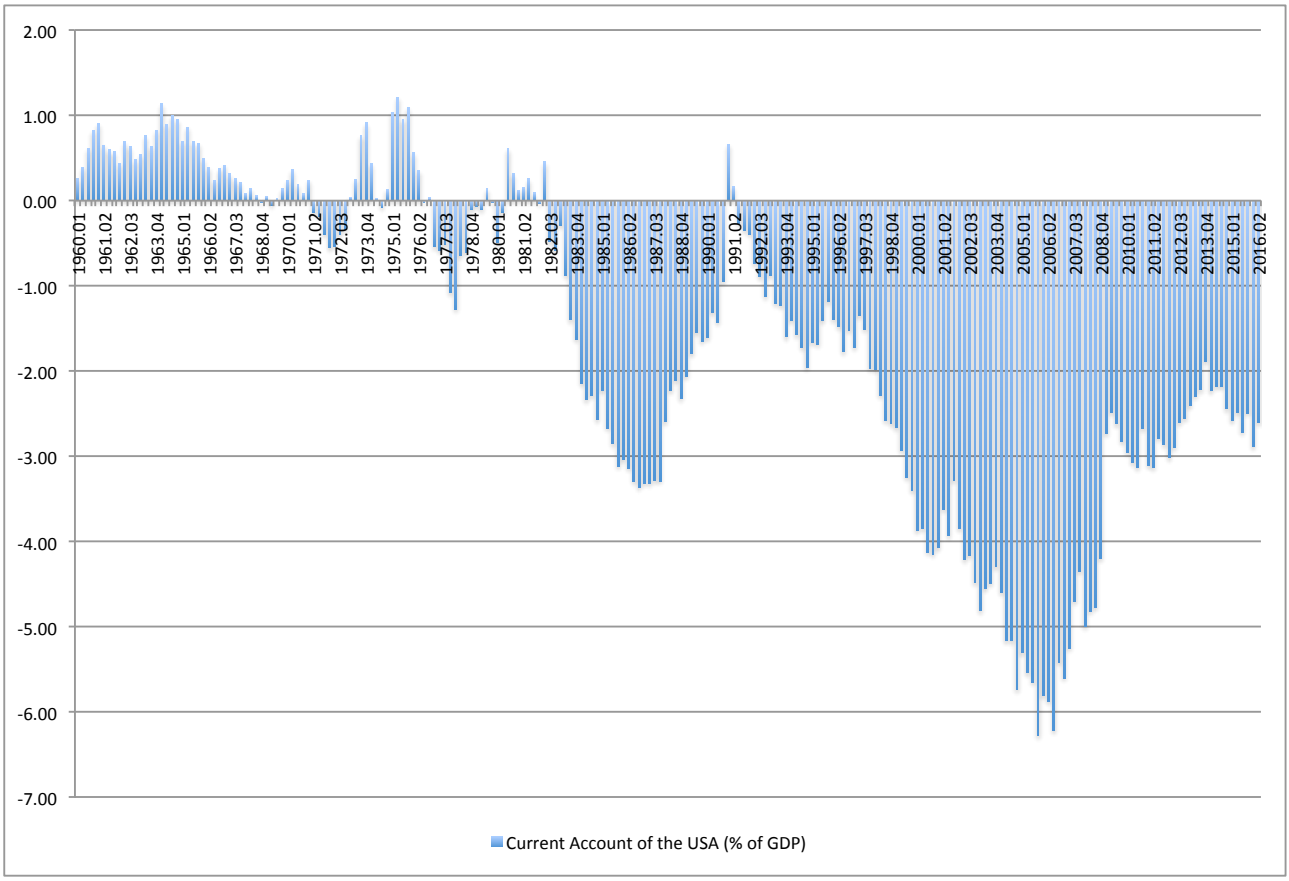
Obstfeld M. and A.C. Stockman (1985), "Exchange Rate Dynamics", in Jones R.W. and P.B. Kenen (eds), *Handbook of International Macroeconomics,* Amsterdam, North Holland.

Obstfeld M. and K. Rogoff (1996), *Foundations of International Macroeconomics,* Cambridge Mass., MIT Press.

Ramsey F. P. (1928), "A Mathematical Theory of Saving", *The Economic Journal,* 38 (152), pp. 543-559.

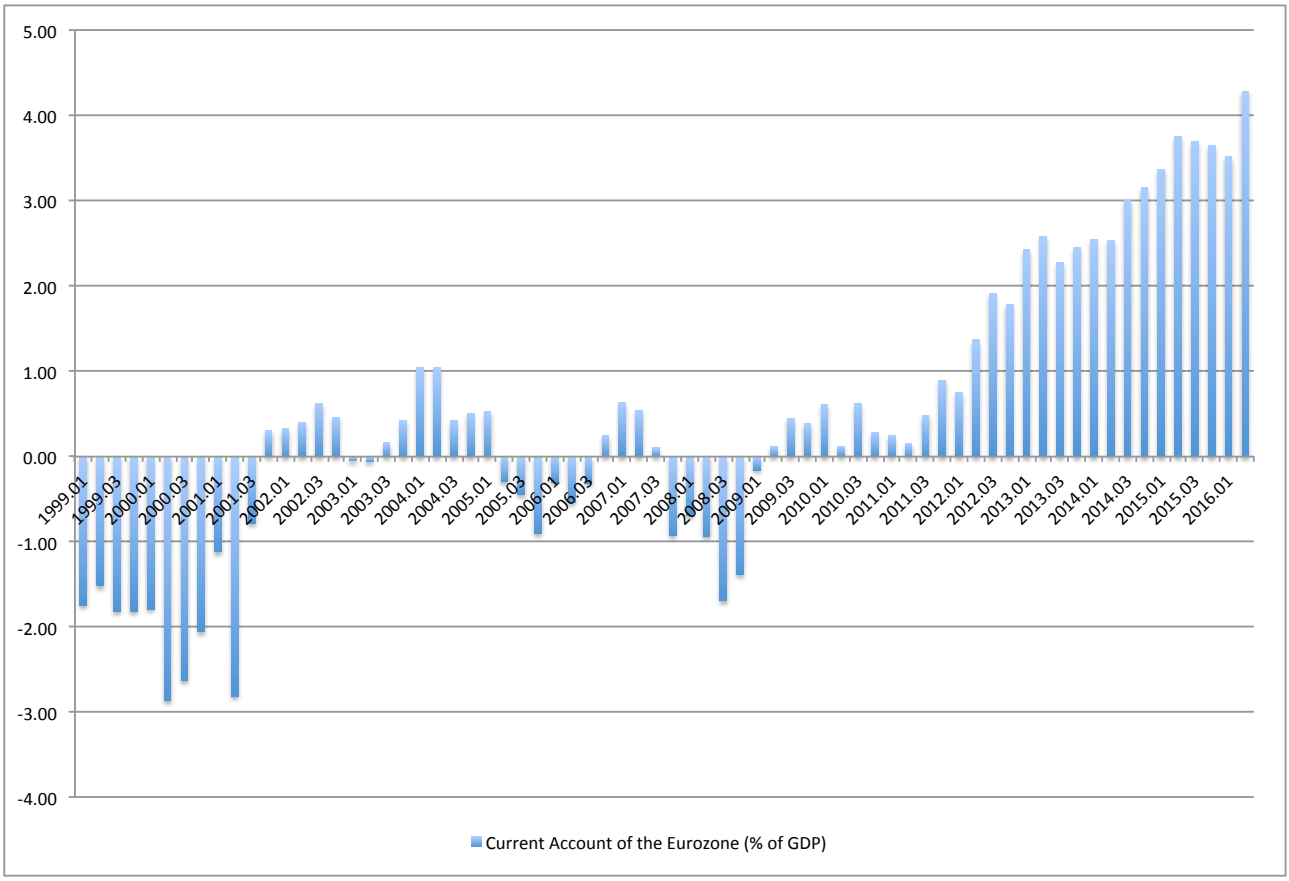
Triffin R. (1960), *Gold and the Dollar Crisis,* New Haven, Yale University Press.

Figure 1.1
The Current Account of the USA, 1960-2016
(% of GDP)



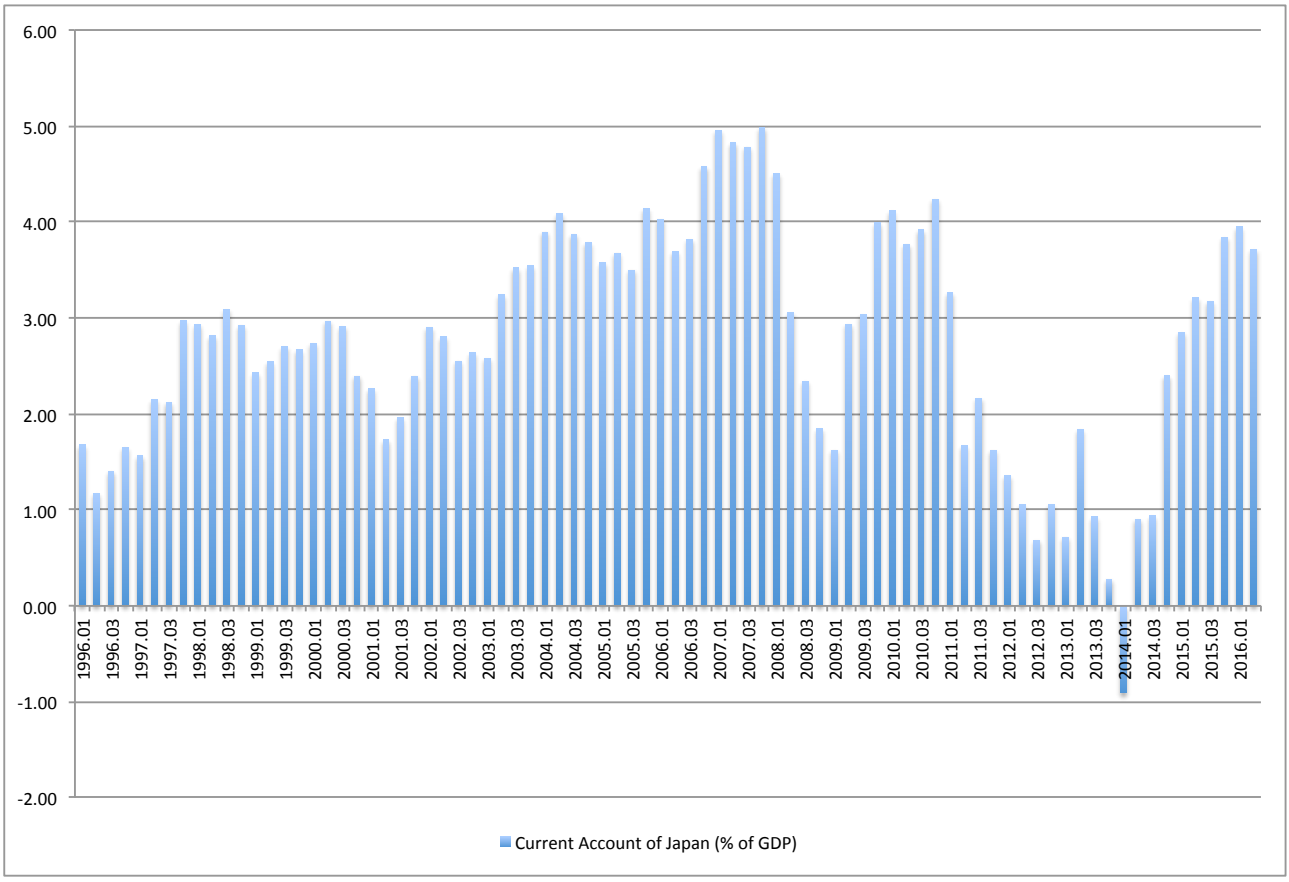
Source: Organization for Economic Cooperation and Development (OECD)

Figure 1.2
The Current Account of the Eurozone, 1999-2016
(% of GDP)



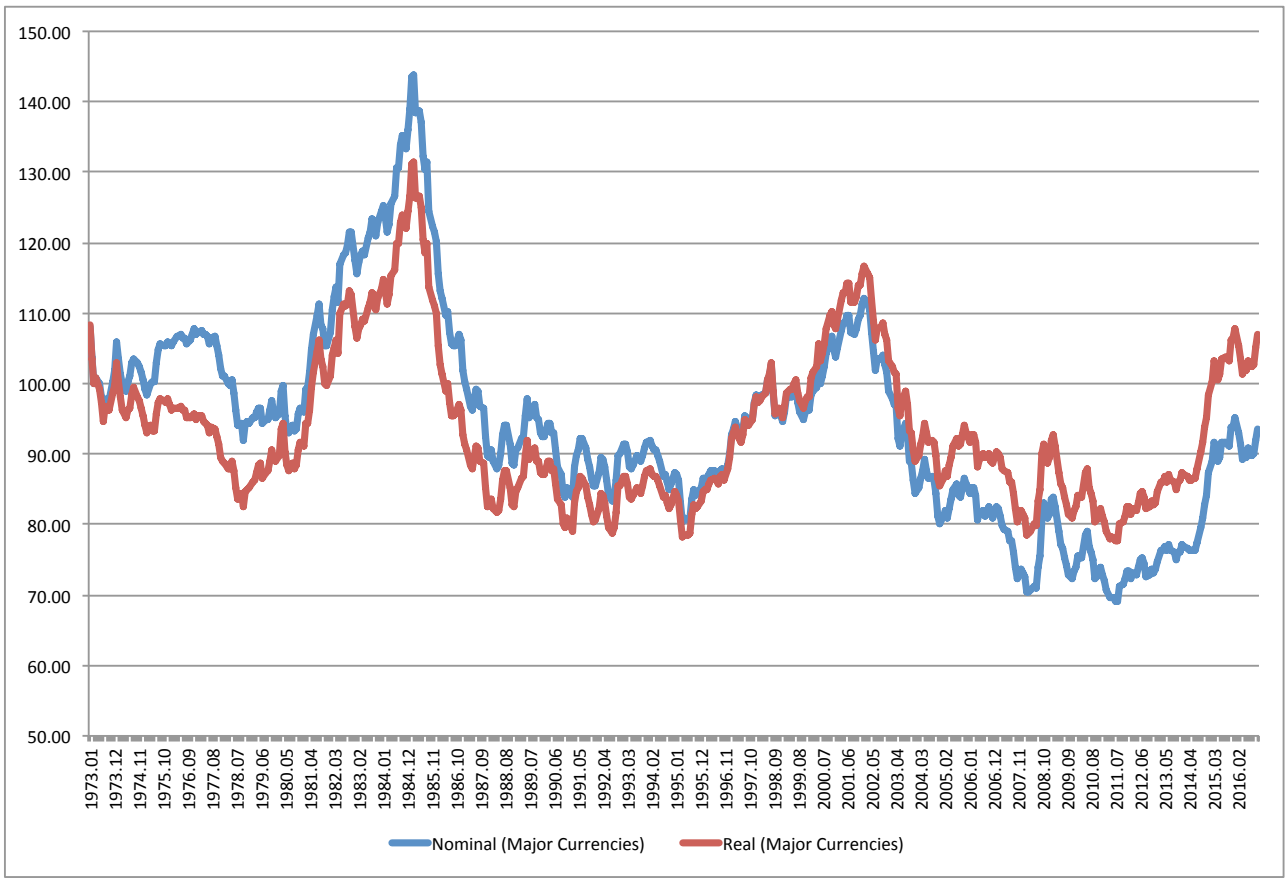
Source: Organization for Economic Cooperation and Development (OECD)

Figure 1.3
The Current Account of Japan, 1996-2016
(% of GDP)



Source: Organization for Economic Cooperation and Development (OECD)

Figure 1.4
The Nominal and Real Effective Exchange Rate of the US Dollar, 1973-2016
(March 1973=100)



Source: Federal Reserve Board