

# **The International Monetary System**

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As Samuelson and Nordhaus point out, while the simple supply-and-demand diagrams for the foreign exchange market explain the major determinants, they do not capture the drama and central importance of the international monetary system (2005, p. 609). The 1990s witnessed crisis after crisis in international finance – the British pound fallout of the European Monetary System in the early 1990s, the Mexican peso crisis in 1994-1995, the Asian financial crisis in 1997, the Russian debt crisis in 1998, and the Brazilian and Argentine currencies crises around the turn of the 21st century. This period underlined the importance of a well-functioning international monetary system.

The concepts of balance of payments are closely related to those of the international monetary system. The international monetary system is the structure within which foreign exchange rates are determined, international trade and capital flows are accommodated, and balance-of-payments adjustments made. In this lesson, we will survey the historical development of the exchange rate regimes including the gold standard, the fixed dollar exchange rate regime under the Bretton Woods system after the WWII, and the hybrid system of managed floating exchange rate regime now operating since 1973. We will highlight the advantages and disadvantages of the fixed and floating exchange rate systems.

Main concepts of the lesson:

- The international monetary system
- Current account convertibility
- Capital account convertibility
- The gold standard
- Automatic adjustment
- David Hume's gold-flow equilibrating mechanism
- The Bretton Woods system
- Fixed exchange rate regime
- Floating exchange rate regime

## **Learning objectives**

The objective of this lesson is to understand the importance of the international monetary system and the basic characteristics of fixed and floating exchange rate regimes. At the completion of this lesson, you will be able to:

1. Define the international monetary system and describe its importance.
2. Describe the gold standard and how exchange rate was determined under gold standard.
3. Explain David Hume's gold-flow equilibrating mechanism.
4. Describe the balance of payments adjustment process under gold standard.
5. Describe the Bretton Woods exchange rate system.
6. Describe the characteristics, advantages and disadvantages of a fixed exchange rate regime and a floating exchange rate regime.
7. Contrast the fixed-exchange-rate system of the gold standard with the pure floating of a flexible-exchange-rate system. Describe the intermediate managed floating system that characterizes the contemporary international system.

**References:**

Samuelson and Nordhaus. 2005.

Chapter 29: Exchange Rates and the International Financial System

Krugman and Obstfeld. 2003.

Chapter 17: Fixed Exchange Rates and Foreign Exchange Intervention

Chapter 18: The International Monetary System, 1870 – 1973

Chapter 19: Macroeconomic Policy and Coordination under Floating  
Exchange Rates

Read the descriptive text of these chapters and get the main ideas of the  
subjects covered.

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# The International Monetary System

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What is the international monetary system? This term denotes the institutions under which payments are made for transactions that cross national boundaries. In particular, the international monetary system determines how foreign exchange rates are set and how governments can affect exchange rates (Samuelson and Nordhaus, 2005, p.609).

The importance of the international monetary system was well described by economist Robert Solomon:

*Like the traffic lights in a city, the international monetary system is taken for granted until it begins to malfunction and to disrupt people's lives. ... A well-functioning monetary system will facilitate international trade and investment and smooth adaptation to change. A monetary system that functions poorly may not only discourage the development of trade and investment among nations but subject their economies to disruptive shocks when necessary adjustments to change are prevented or delayed.*

Robert Solomon, *The International Monetary System, 1945 – 1981: An Insider's View* (Harper & Row, New York 1982), pp. 1,7.

In this lesson, we are going to survey the major exchange rate regimes from a historical perspective, from the gold standard to the Bretton Woods system to the current hybrid system.

## Lesson outline

The gold standard and the balance of payments adjustment mechanism

The Bretton Woods exchange rate system

The current hybrid exchange rate system

Characteristics, advantages, and disadvantages of fixed and floating exchange rate systems

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# International Monetary System

- **Exchange Rate Regimes**
    - **Fixed rates**
      - Gold standard
      - The Bretton Woods system
    - **Floating rates**
    - **Managed exchange rates**
    - **Other arrangements**
  - **Characteristics**
    - **The role of government (central bank)**
    - **Exchange rate determination**
    - **Balance of payments adjustment**
  - **Convertibility**
- 

The central element of the international monetary system involves the arrangements by which exchange rates are set. The purpose of an exchange-rate system is to facilitate and promote international trade and finance. There have been three major exchange rate regimes from a historical perspective – fixed, floating, and managed exchange rates.

*A **fixed-exchange-rate system*** is one where governments set official exchange rates and defend the set rates through foreign exchange market intervention and monetary policies. The gold standard, the Bretton Woods system, and the European Monetary System (EMS) are historical examples of fixed exchange rate regimes, although they differ in specific aspects. *A **freely flexible or floating exchange rate*** is one determined purely by supply and demand without any government intervention. This is more of a theoretical benchmark rather than reality in practice. Most economies fall in between the two extremes – a rigidly fixed system and a purely floating system. The United States, the EU, and Japan are close to the flexible exchange rate system, although central banks of these countries intervene in the foreign exchange market from time to time. *A **managed-exchange-rate system*** is a hybrid of fixed and flexible rates in which governments attempt to affect their exchange rates directly by buying or selling foreign currencies or indirectly, through monetary policy, by raising or lowering interest rates. There have been other arrangements that are variations of the one of the three regimes.

Each of these exchange rate regimes has its own characteristics which may be classified in the following dimensions: the role of the government, how the exchange rate is determined, and how a balance of payments imbalance is adjusted. For example, under a purely floating exchange rate system, the central bank does not intervene in the foreign exchange market; the exchange rate is determined purely by market forces; the balance of payments and the exchange rates adjust simultaneously to equilibrium.

In addition to exchange rate policy (what type of exchange rate regime to adopt), a government also decides whether to allow free convertibility of its currency to other currencies. Based on the two major parts of the balance of payments, convertibility can be applied to either account alone or both. ***Current account convertibility*** means that foreign exchange can be freely bought and sold provided its use is associated with international trade in goods and services. But there are still restrictions when the intended use of the foreign exchange is to purchase foreign financial assets or to make equity investments (Grabbe, 1986, p.12). Free trade in currencies for the latter purpose is called ***capital (financial) account convertibility***. If convertibility is allowed for transactions in both the current and the financial accounts, we say there is ***full convertibility***. Full convertibility is equivalent to free capital mobility. Restrictions on convertibility are referred to as foreign exchange control.

The U.S. and Canadian dollars became convertible in 1945. Most countries in Europe did not restore current account convertibility until the end of 1958.

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## Gold Standard: Automatic Adjustment

Automatic

- OSB deficit ↑

→  $G \downarrow$  →  $M_s \downarrow$  →  $P \downarrow$  →  $X \uparrow$  →  $M \downarrow$

→ BOP deficit ↓

- This automatic adjustment process under gold standard is called the [David Hume] **price-specie-flow mechanism**.

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Fixed exchange rates were the norm in many periods, such as the decades before World War I (the gold standard) and between 1945 and 1973 (the Bretton Woods system). The world exchange rates are more flexible than fixed today. However, the debate about choice between floating and fixed systems is intense. It is important to understand each system before we can make a comparison.

Historically, the most important fixed-exchange-rate system was the **gold standard**, which was used off and on from 1717 until 1933 (Samuelson and Nordhaus, 2005, p. 610). In this system, each country defined the value of its currency in terms of a fixed amount of gold, thereby establishing fixed exchange rates among the countries on the gold standard. The United States adopted the gold standard in 1879 and defined the US\$ as 23.22 fine grains of gold. With 480 fine grains per troy ounce, it took \$20.67 to equal one ounce of gold (Levich, 2001, p. 26). Similarly, the British pound was defined as £1 = 113 grains of fine gold. So it took £4.2474 to equal one ounce of gold. As we have seen before, the exchange rate was determined at \$4.86656/£ based on the gold contents of the currencies. Exchange rates were fixed for all countries on the gold standard. The exchange rates (also called “part values” or “parities”) for different currencies were determined by the gold content of their monetary units. Given Britain’s preeminence in international trade and the advanced development of its financial institutions, London naturally became the center of the international monetary system built on the gold standard (Krugman and Obstfeld, 2003, p. 537).

How does the gold standard work if a country has a greater demand for foreign goods so that it has an overall balance deficit or OSB deficit (OSB stands for official settlement balance)? The adjustment mechanism is depicted in the slide. Let’s say this country is our country. An OSB deficit means that we have to pay more gold (G here stands for gold, not for government spending as in GDP accounting) to other countries for our deficit. Under the

gold standard, gold is an important part of the money supply. Since we are losing gold to other countries as a result of our OSB deficit, our money supply ( $M_s$ ) goes down. The decrease in our money supply in turn drives down the prices ( $P$ ) of our products. This makes our products more price competitive in the world market so that our exports ( $X$ ) will increase and imports ( $M$ ) decrease. As a result, our BOP deficit (read as OSB or the overall balance) is reduced and eventually the balance of our payments will be restored.

This adjustment mechanism is the well-known David Hume's ***gold-flow adjustment mechanism***, which is also referred to as the ***price-specie-flow mechanism***. This process was demonstrated by the Scottish philosopher David Hume in 1752. The idea of this mechanism helped refute the mercantilist views on trade. A trade surplus cannot be sustained under the gold standard since the inflow of gold will eventually drive up domestic prices and lead to a reversal of trade flows.

Hume's gold-flow mechanism was based in part upon the quantity theory of prices, which holds that the overall price level in an economy is proportional to the supply of money. Since each unit of a country's currency represented a specific amount of gold, the amount of gold in a country determined the country's money supply under the gold standard.

The essence of the Hume gold-flow mechanism is that a country's balance of payments adjusts automatically to reestablish new equilibrium at which there is no net gold flow. That is, an OSB deficit or surplus automatically adjusts itself to balance through changes in relative prices (or price competitiveness). This automatic adjustment requires no tariffs or other government intervention in the foreign exchange market. Although the idea of the gold-flow mechanism is more than 250 years old, the insights it presents still apply to fixed exchange rate systems.

While the gold standard requires no government intervention in trade or foreign exchange, the government does have an obligation to keep the gold contents of its currencies. The gold standard essentially involved a commitment by the participating countries to fix the prices of their domestic currencies in terms of a specified amount of gold. The countries maintained these prices by being willing to buy or sell gold to anyone at that price, that is, intervening in the "gold market."

While the automatic adjustment mechanism under a fixed change rate regime keeps a country's external balance – the balance of payments in balance without government intervention, there is an internal cost associated with it. Recall that domestic prices have to adjust as well in tandem with the balance of payments adjustment. When we have an OSB deficit and money supply decrease as a result of losing gold (under the gold standard) or foreign reserves (under a fixed exchange rate regime), our economy is likely to go through a recession – price level goes down and unemployment goes up. That is, the whole economy is adjusting to an imbalance in the external balance.



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## Gold Standard: Advantages and Disadvantages

- **Characteristics**
    - **Reserves**
    - **Money supply**
  - **Advantages**
    - **Monetary discipline**
    - **Symmetric monetary adjustment**
  - **Disadvantages**
    - **Constraints on the use of monetary policy to fight unemployment**
    - **Reserve shortage**
    - **Asymmetric distribution of gold production**
- 

Some of the characteristics of the gold standard have already been mentioned in the foregoing discussions. They include the gold contents of currencies, money supply being determined by a country's gold stock, and automatic adjustment of the balance of payments and prices (and the entire economy) or no requirement of government intervention. The gold standard had its origin in the use of gold coins as a medium of exchange, unit of account, and store of value.

The main advantages of the gold standard were its monetary discipline and symmetric monetary adjustment. There was **monetary discipline** because central banks throughout the world were obliged to fix the money price of gold. They could not allow their money suppliers to grow more rapidly than real money demand, since such rapid monetary growth eventually raises the money prices of all goods and services, including gold. **Symmetric monetary adjustment** refers to the fact that no country in the system occupied a privileged position by being relieved of the commitment to intervene (or to defend the value of its currency). Countries shared equally in the cost or burden (relative prices changes, unemployment or recession) of balance of payments adjustment.

The gold standard had a number of drawbacks as well. Since the money supply was tied up to the stock of gold in a country, there were constraints on the use of monetary policy to fight unemployment. In a worldwide recession, it might be desirable for all countries to expand their money supplies jointly even if this were to raise the price of gold in terms of national currencies. But they could not do that if they were to keep the gold standard. A second drawback was a reserve shortage. As the economy grew, more money would be needed to facilitate the increasing economic transactions. But limits in gold supply might not keep up with economic growth and therefore would hinder economic growth.

Another drawback of the gold standard was the asymmetric distribution of gold production and stock. The gold standard could give countries with potentially large gold production considerable ability to influence macroeconomic conditions throughout the world through market sales of gold.

The following table illustrates the current distribution of monetary gold (gold in the central bank reserves) in the world. As of April 2004, industrial countries had 82% of the world's total gold in reserves. United States had 29% while the Euro area countries had 43%.

<b>Gold in Reserves</b>		
Million Fine Troy Ounces		
As of Apr. 2004		
All Countries	910.66	100%
Industrial Countries	751.24	82%
U.S.	261.59	29%
Japan	24.6	3%
Euro Area (incl. ECB)	393.54	43%
Germany	110.58	12%
France	97.25	11%
Italy	78.83	9%
Switzerland	49.43	5%
All developing countries	159.43	18%
Sources: IMF, <u>International Financial Statistics</u> , September 2004		

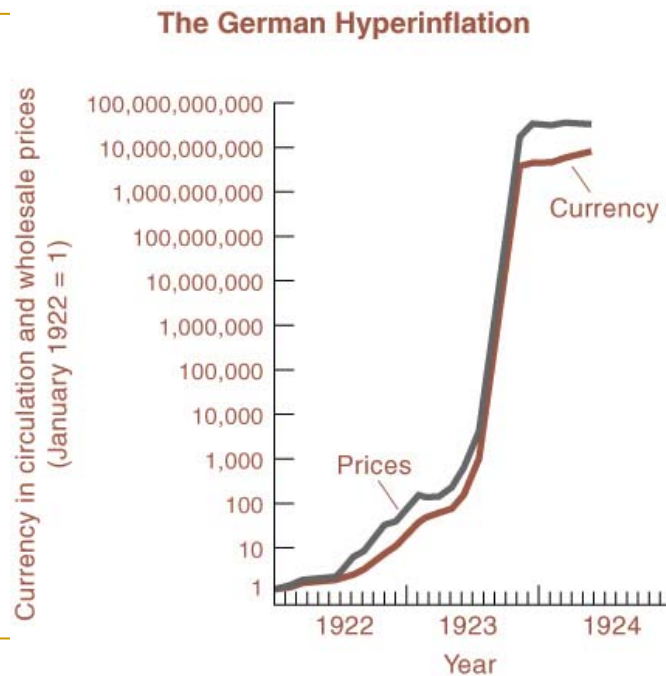
### Why did the Gold Standard Fail?

The outbreak of World War I was a direct cause for the collapse of the gold standard. Governments abandoned the gold standard during the war and financed part of their massive military expenditures by printing money without the backing of gold. Further, labor forces and productive capacity had been reduced sharply through war losses. As a result, price levels were higher everywhere at the war's conclusion in 1918. The loss of confidence in the British pound as a reserve currency was another reason. A *reserve currency* is one that the central banks hold in their international reserves, and under a fixed exchange regime, each nation's central bank fixes its currency's exchange rate against the reserve currency by standing ready to trade domestic money for reserve assets at that rate. Under gold standard, the British pound was the reserve currency and was regarded as good as gold. The U.K. deficits in its balance of payments made other countries worry about the U.K.'s inability to convert £s into gold.

During the inter-war years (1918-1939), several countries returned briefly to gold standard. But as the great depression continued, many countries renounced their gold standard obligations and allowed their currencies to float in the foreign exchange market.

## Money and Hyper- inflation in Germany

1922-  
1924



Inflation was rampant in some economies at the end of WWI. The most celebrated episode of inter-war inflation is the German hyperinflation, during which Germany's price index rose from a level of 262 in January 1919 to a level of 126,160,000,000,000 in December 1923 -- a factor of 481.5 billion!

The loss of confidence in the U.K., the existence of multiple reserve currencies (£, \$, French franc) and the hyperinflation in Germany all contributed to the failure to restore the gold standard.

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## The Bretton Woods System

- Issues leading to the Bretton Woods agreement
  - The Bretton Woods exchange rate system
  - The IMF and the World Bank
  - Special drawing rights (SDRs)
  - Balance of payments adjustment
  - Policy coordination
- 

The depression of the 1930s, followed by the war, had vastly diminished commercial trade, the international exchange of currencies, and cross-border lending and borrowing. The world needed a stable and cooperative system and mechanism to facilitate trade and investment, and to assist the reconstruction of the war-torn economies and the adjustment of balance of payments.

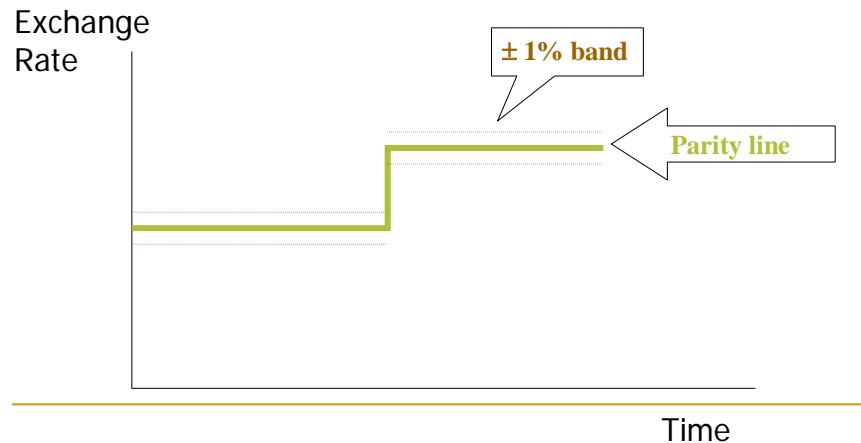
In July 1944 representatives of 44 countries met in Bretton Woods, New Hampshire,<sup>1</sup> and signed the Articles of Agreement of the International Monetary Fund, known as the Bretton Wood agreement. The Bretton Woods agreement attempted to recreate key parts of the gold standard and produced a fixed but adjustable exchange regime, which was implemented in 1946. The agreement recognized the more important role of U.S. in world economy and incorporated the US dollar in international reserves. Two important international financial institutions, the International Monetary Fund (IMF) and the World Bank, were born out of Bretton Woods agreement.

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<sup>1</sup> Bretton Woods is a tiny ski village in the White Mountains whose notable features are the world's longest cog railway and the mammoth Mount Washington Resort Hotel – which, situated at the foot of the Presidential range, is an ideal setting for a conference (Grabbe, 1991, p.3).

## The Bretton Woods System

### Basic Features



#### Features of Bretton Woods System

##### **Reserves:**

Gold, U.S. \$ and SDR (added in 1960s)

The U.S. dollar replaced the British pound as the reserve currency and was treated as good as gold.

##### **Fixed parities**

Under the original provisions of the Bretton Woods agreement, all countries fixed the value of their currencies in terms of gold but were not required to exchange their currencies for gold. Only the dollar remained convertible into gold (at \$35 per ounce). Therefore each country established its exchange rate vis-à-vis the dollar. This is often called the two-tier system: (1) US \$ pegged to gold: \$35/ounce of gold → dollar-gold parity, and (2) other currencies pegged to dollar. For example, the British pound was fixed to the dollar at \$2.80/£, and Japanese yen was pegged to the dollar at ¥360/\$.

##### **Adjustable parities**

Although each country's exchange rate was fixed, it could be changed – devalued or revalued against the dollar – if the IMF agreed that the country's balance of payments was in a situation of "fundamental disequilibrium."

##### **Narrow band (1% on either side of parity)**

The exchange rates were allowed to fluctuate within 1% of its stated par value. Other countries would buy and sell U.S. dollars to keep market exchange rates within the 1 percent band around par value – foreign exchange market intervention (as required by the system).

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## The Bretton Woods System

### The Role of the IMF

- **IMF lending facilities**

The IMF stood ready to lend foreign currencies to members to tide them over periods during which their current accounts were in deficit

- **IMF conditionality**

Surveillance over the policies of member countries that are heavy borrowers of Fund resources.

- **SDRs**

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An integral part of the Bretton Woods system was the establishment of the IMF, which still administers the international monetary system and operates as a central bank for central banks (Samuelson and Nordhaus, 2005, p. 612). Member nations subscribe by lending their currencies to the IMF; the IMF then re-lends these funds to help countries in balance-of-payments difficulties. The main function of the IMF is to make temporary loans to countries to help them tide over difficulties with current account deficits and financial crises. Member countries are entitled to borrowing from the IMF up to a certain limit – its contribution to the IMF. Beyond that limit, the IMF' lending is conditional upon the borrowing country's accepting the IMF surveillance over its policies.

#### **IMF Conditionality**

*When a country borrows from the IMF, its government makes commitments on economic and financial policies-a requirement known as conditionality. Conditionality provides assurance to the IMF that its loan will be used to resolve the borrower's economic difficulties and that the country will be able to repay promptly, so that the funds become available to other members in need. In recent years, the IMF has worked to focus and streamline the conditions attached to its financing, in order to promote national ownership of strong and effective policies.*

<http://www.imf.org/external/np/exr/facts/conditio.htm>

**Special drawing rights (SDRs)**

During the 1960s it appeared that the world economy might be slowed down because of inadequate reserves to back the robust economic expansion the world was then experiencing. The principal reserves during that era were gold and U.S. dollars, and there was a problem with the supply of each. The supply of gold was limited by the difficulty of finding and raising it from the ground. New supplies of gold could not keep pace with the rapid expansion of the world economy. The supply of dollars to be kept on reserve by other nations depended on the willingness of the United States to spend and invest abroad more money than it took in. Since the United States could not be counted on to continue to do so indefinitely, a long-range shortage of reserves was possible. In response to this possibility, the IMF was empowered in 1969 to issue an asset called the Special Drawing Rights (SDRs), which members add to their holdings of foreign currencies and gold held in their central banks.

Please visit the following sites for more information on the SDR:

<http://www.imf.org/external/np/exr/facts/sdr.htm>

<http://www.imf.org/external/pubs/ft/survey/sup0998/11.htm>

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## The Bretton Woods System

### BOP Adjustment and Issues

- Automatic adjustment
    - $OSB < 0$
    - **FX market intervention** (selling FX)
    - $\rightarrow$  Loss of reserves  $\rightarrow$  Money supply  $\downarrow$
    - $\rightarrow$  Economic recession (unemployment  $\uparrow$  and price  $\downarrow$ )
    - $\rightarrow X \uparrow$  and  $M \downarrow \rightarrow OSB = 0$
  - **Money supply sterilization**
- 

The balance of payment adjustment mechanism under the Bretton Woods system was very much the same as that under gold standard. A major difference was that, instead of gold, countries other than the United States needed to keep adequate international reserves in U.S. dollars (if they did not have a lot of gold) so that they would stand ready to defend their fixed exchange rates with the dollar. For example, if a country ran an OSB deficit – spending more foreign exchange than it has earned, there would be downward pressure for the country's currency (supply and demand effects). To keep the exchange rate fixed, the central bank had to sell U.S. dollars and buy its own currency in the FX market. This is what we have often referred to as FX market intervention. Under the Bretton Woods system, countries other than the United States were required, or obligated to intervene in the foreign exchange market.

The balance of payments adjustment process is depicted in the slide above. If we have an OSB deficit, the central bank intervenes in the FX market by selling U.S. dollars, thus reducing its international reserves and its money supply. As a result, interest rate goes up, investment and consumption go down, leading to an economic recession (unemployment up and price down). In turn, our exports go up and imports go down, so our balance of payments goes back to equilibrium. This is, again, an automatic adjustment – no need for the government to interfere with trade or investment flows. This occurs at a cost – the entire economy adjusts with the balance of payments through a painful recession.

What if the adjustment is so painful and politically not acceptable (particularly in a re-election year)? Is there any way to negate or reduce the effect of foreign exchange market intervention on the money supply? The answer is yes, at least temporarily. The money supply can be sterilized. When a decrease (or increase) in money supply as a result of foreign exchange intervention may have undesirable impacts on the economy



(e.g. recession or inflation). So the central bank may choose to *sterilize* the money supply through *open market operation*.

**Sterilization:**

Actions by the Central Bank to reduce or negate the effects of foreign exchange intervention on the money supply,  $M_s$ .

**Open-market operations:**

Purchases or sales of securities or other assets by the central bank. Such actions change the monetary base. Usually the term is restricted to purchases and sales of domestic assets (such as government bonds). Recall that purchases and sales of foreign exchange are called "foreign exchange market intervention." Either activity changes the monetary base in a similar way.

**Sterilization process:**

Suppose  $OSB < 0$ ,

**Foreign exchange market intervention** (as described previously):

Central bank sells foreign currency,  $\rightarrow$  International reserves  $\downarrow$  (the other side of the transaction: buys domestic currency – less money circulating in the economy)  $\rightarrow M_s \downarrow$

**Open-market operation:**

Central bank buys government bond,  $\rightarrow$  central bank's holding of domestic assets  $\uparrow$  (the other side of the transaction: sells domestic currency – more money circulating in the economy),  $\rightarrow M_s \uparrow$

The impact of open-market operation on money supply offsets the effect of foreign exchange intervention on money supply. So the money supply is being sterilized. So there will be no recession, unemployment will not go up, and price will not go down. But, OSB deficit will not go away either! We will have to continue to sell FX in the foreign exchange market (our reserves continue to decrease), and to buy government bonds. Eventually, our international reserves will deplete – no more reserves to sell and no longer having the ability to intervene in the foreign exchange market. We will have no choice but to devalue our currency. This is what happened to the British pound in November 1967: the pound devalued from \$2.80/£ to \$2.40/£. So sterilization cannot go on forever. If there is a fundamental force that has caused the value of a currency to go down or up, any temporary measure will not help in the long run. The exchange rate will have to reflect the fundamental market force.

One of the differences between the gold standard and the Bretton Woods system is that, while both are fixed exchange rate systems, the Bretton Woods system allowed a member country to adjust the values of its currency, the exchange rate, when there was a fundamental problem with the country's balance of payments.

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## The Bretton Woods System

### Failure

- Issues of coordination
  - In August 1971, U.S. suspended total convertibility of the dollar to gold.
  - Resulted in no parity between currencies
    - ➔ Currencies began to float.
  - Attempts to re-adopt system failed by 1973 (coupled with first oil shock).
  - Resulted in acceptance by governments of present system
    - ➔ floating or managed floating.
- 

With its currency as the sole reserve currency, the United States was in a unique position in the Bretton Woods system. Its money supply, unlike other countries', was not tied up to defend the exchange rate system. The expansionary policy in the United States in the 1960s led to higher inflation in the U.S. than in Japan and West Germany. The U.S. balance of payments suffered increasing deficits. In the meantime, Japan and West Germany became increasingly competitive in the world market and their currencies were under pressure to revalue. While the United States called on Japan and West Germany to revalue their currencies, Japan and West Germany called upon the United States to control its government spending and inflation.

From purchasing power parity, we know that when the exchange rates are fixed, inflation rates for countries under the fixed exchange rate system have to be the same. That is, countries have to coordinate their macroeconomic policies. But policy coordination is often times difficult due mainly to issues of sovereignty.

The coordination failures among the large economies led to the collapse of the Bretton Woods system. In August 1971, the United States suspended total convertibility of the dollar to gold. This resulted in no parity between currencies ➔ Currencies began to float. Attempts to re-adopt the fixed rate system failed by 1973 (coupled with first oil shock). Countries eventually accepted what is now the current exchange rate system – a hybrid of different exchange rate regimes.

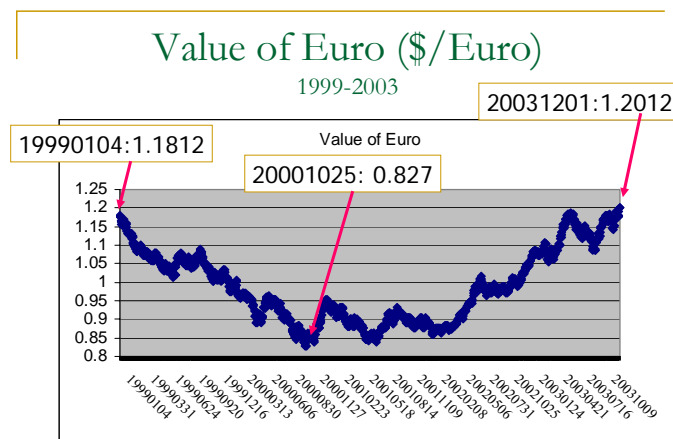
The biggest advantage of the Bretton Woods regime was that it provided a stable exchange rate environment that nurtured the reconstruction of the world economy and the growth of international trade and finance. The main disadvantage was that it required coordination of policies among member countries.

## The European Monetary System (EMS): 1979-1998

- After the 1971-1973 crisis, Germany and other countries participated in an informal joint float against the dollar known as the “snake.”
- Eight European countries began operating a formal network of mutually pegged exchange rates, known as the European Monetary System (EMS), in March 1979.
- Jan. 1, 1999, Euro launched

After the collapse of the Bretton Woods system in 1973, while allowing their currencies to float against the dollar, the EU countries tried progressively to narrow the extent to which they let their currencies fluctuate against each other. These efforts culminated in the birth of the euro on January 1, 1999. They at first participated in an informal joint float against the dollar known as the “snake.” In 1979, Eight European countries began operating a formal network of mutually pegged exchange rates, known as the European Monetary System (EMS).

The graph below shows the fluctuation of the euro against the dollar. It was worth about \$1.18 when it was first initiated. It then moved downward till it reached its lowest point at \$.0.827 on October 25, 2000. It went up gradually since then. On December 30, 2004, it was equal to \$1.3643 (*Wall Street Journal* online).



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## Current exchange rate regimes:

### A mixed system

- Independent floating
  - Managed floating with pre-announced path for exchange rate
  - Exchange rates within crawling bands
  - Crawling pegs
  - Pegged exchange rates within horizontal bands
  - Other conventional fixed peg arrangements (including de facto peg arrangements under managed floating)
  - Currency board
  - Exchange arrangements with no separate legal tender
- 

The current exchange rate system is a hybrid of many different arrangements, as listed above. The arrangements for specific countries can be found in an IMF publication called International Financial Statistics. Because these arrangements change so frequently, it is highly recommended that you get a most recent copy of the publication to find updated information.

The technical details of these arrangements are beyond the scope of this course. Those who are interested in these details can find them in the IMF publication as just mentioned. However, it is interesting and informative to know a few important facts. The United States, the EU, Japan, the United Kingdom, Switzerland, and Canada are among the major countries that follow an independent floating policy. At the other end of the exchange rate regime spectrum (from floating to fixed) is the currency board, which is a monetary regime based on an explicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed rate, combined with restrictions on the issuing authority to ensure the fulfillment of its legal obligation. Argentina was an example before the system failed in 2002. Currently, Hong Kong is a well known example of such an arrangement.

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## Fixed Exchange Rate System

### Key features

- Domestic currency is **pegged** to an anchor currency: (e.g.: Mexican peso to the dollar before 1994 crisis)
  - Prices and interest rates have to be in line with the anchor currency: **monetary discipline**
  - Central bank has responsibility to defend exchange rate: **foreign exchange market intervention**
  - Central bank has to maintain adequate international **reserves** to intervene in the foreign exchange market
- 

We summarize our previous discussions on the various exchange rate regimes by highlighting the features, advantages, and disadvantages of the fixed and floating exchange rate systems.

The main features of a fixed exchange rate regime are outlined in the slide above. Developing countries choose to adopt a fixed exchange rate regime or variations of such a regime (such as a currency board) for the purpose of borrowing monetary discipline (control inflation). So the main advantages of a fixed rate regime are monetary discipline and fiscal discipline. Monetary discipline means that the country's money supply is tied up to defending the fixed exchange rate. By fixing the exchange rate, the country has to follow the monetary policy of the country to whose currency it fixes its own currency – it cannot have a higher inflation than the country it has fixed to. That is, the country cannot issue currency freely to cause inflation. Many countries issue currency simply to finance government spending. By controlling money supply through a fixed exchange rate, the country is also being disciplined on its fiscal policy – it cannot spend freely. When a country violates the rules of these fixed exchange rate discipline, the fixed rate system collapses and financial crisis often ensues.

The same advantages may mean disadvantages if viewed at different perspectives. The main disadvantages of a fixed exchange rate regime include the following:

#### Disadvantages of fixed exchange rate

- ◆ Loss of monetary independence: Central bank cannot use money supply as a tool to stimulate the economy
- ◆ Burden to keep adequate reserves (how to get reserves?)
- ◆ Real exchange rate fluctuation (more like real exchange rate appreciation)
- ◆ Subject to huge losses due to attacks by speculators
- ◆ Danger of sudden collapse of system and financial and economic instability (crisis)

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## Floating Exchange Rate System

### Key features

- No government intervention required
  - Exchange rate determined by market forces
  - Frequent fluctuations
  - Balance of payments adjusts simultaneously with the exchange rate
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The main features of a floating exchange rate regime are listed above.

Advantages of a floating exchange rate regime are related to these features. First, since the country is not required to defend the exchange rate at a certain level, the central bank is free to choose a particular policy (increase or decrease money supply) to deal with domestic issues such as inflation or unemployment. This is called monetary policy independence. As mentioned before, under the Bretton Woods system, countries other than the United States were not independent in choosing their monetary policies. They had to follow the U.S. monetary policy since their currencies were fixed to the dollar. Under the European Monetary System (EMS), countries other than Germany had to coordinate with German policies as Germany was the dominating economy in the system. The fight for policy independence was in part the reason for the collapse of the Bretton Woods system. Second, by definition, there is no requirement for foreign exchange market intervention under a floating exchange rate regime. Third, since there is no need for intervention, there is very low requirement for international reserves.

Of course, a floating exchange rate regime has its disadvantages. The most obvious one is that there is uncertainty and exchange rate risk associated with international trade and investment. For countries that lack monetary and fiscal disciplines, a floating exchange rate sets no pressure for a country to observe these disciplines.

## Summary

**In this lesson, we have covered the following major topics:**

- 1. The international monetary system.** A well-functioning international economy requires a smoothly operating exchange-rate system, which denotes the institutions that govern financial transactions among nations.
- 2. Exchange rate regimes.** Three important exchange-rate systems are (a) flexible exchange rates, in which a country's foreign exchange rate is determined by market forces of supply and demand; (b) fixed exchange rates, such as the gold standard or the Bretton Woods system, in which countries set and defend a given structure of exchange rates; and (c) managed exchange rates, in which government interventions and market forces interact to determine the level of exchange rates.
- 3. David Hume's gold-flow adjustment mechanism.** Classical economists like David Hume explained international adjustments to trade imbalances by the gold-flow mechanism. Under this process, gold movements would change the money supply and the price level. For example, a trade deficit would lead to a gold outflow and a decline in domestic prices that would (a) raise exports and (b) curb imports of the gold-losing country while (c) reducing exports and (d) raising imports of the gold-gaining country. This mechanism shows that under fixed exchange rates, countries which have balance-of-payments problems must adjust through changes in domestic price and output levels.
- 4. The Bretton Woods exchange rate system.** After World War II, countries created a group of international economic institutions to organize international trade and finance. Under the Bretton Woods system, countries "pegged" their currencies to the dollar and to gold, providing fixed but adjustable exchange rates.
- 5. The current hybrid exchange rate system.** After the Bretton Woods system collapsed in 1973, it was replaced by today's hybrid system. Today, the major economic regions (the United States, Euroland, and Japan) have currencies that float relative to each other. Most small countries peg their currencies to the dollar or to other currencies.
- 6. Central bank intervention and sterilization.** There is a direct link between central bank intervention in the foreign exchange market and the domestic money supply. When a country's central bank purchases foreign assets, the country's money supply automatically increases. The central bank can negate the money supply effect of intervention through sterilization.

**Problem Assignments** (For review purpose; Do not hand in)

The purpose of this assignment is to understand the main exchange rate regimes the world has experienced and their policy implications (the assignment was adapted from Samuelson and Nordhaus, 2005, p. 618, Question 9).

Consider the following three exchange-rate systems: the classical gold standard, freely flexible exchange rates, and the Bretton Woods system. Compare and contrast the three systems with respect to the following characteristics:

- a. Role of government vs. that of market in determining exchange rates
- b. Degree of exchange-rate volatility
- c. Method of adjustment of relative prices across countries
- d. Need for international cooperation and consultation in determining exchange rates



### Discussion Questions:

1. Outline the worldwide effects of an overvaluation in the currency of a large economy like that of the United States and the various means by which an overvaluation might be corrected under a fixed-rate system (gold flows), a flexible system (market forces), and a managed system (government intervention).
2. Sketch a brief chronology of the evolution of the international financial system from the Bretton Woods fixed-rate system, which was created following World War II, through today's managed-float system.
3. Suppose that two countries are trading under the gold standard. What would be the effect of an inflation that causes all prices to double in one country (a) if the exchange rate were held constant and (b) if it could be adjusted?
4. Explain what it means for the dollar to be "overvalued." How might this happen? What are the effects? What can be done about it? What do those reactions cost?
5. What difficulties might cause a country to devalue the fixed-exchange rate of its currency? Outline the mechanism through which it is expected that devaluation will correct these difficulties.
6. Suppose that, because of its trade deficit, Britain allows the pound to depreciate. List the various mechanisms by which this is expected to correct the trade imbalance. Under what circumstances might these attempts worsen the trade balance?
7. What specific problems led to the collapse of the Bretton Woods system? How has the new international economic system solved these problems? What are the advantages and disadvantages of the current system of managed but flexible exchange rates?
8. In the past two decades the United States has borrowed heavily from abroad to finance its domestic investment. Why has this happened?
9. When a country adopts a fixed exchange rate, it faces an inescapable fact that real output and employment must adjust to ensure that its relative prices are aligned with its trading partners. Explain this statement.

**Review Problem Set** (Some answers are available in the references or the lecture notes)

1. Explain what is meant by managed floating. What advantages does it have over completely free floating exchange rates? Can you think of any disadvantages?
2. What has been the purpose of the creation of the World Bank and the International Monetary Fund? What successes have they had? For what reasons?
3. Compare and contrast the advantages of a freely floating exchange rate with those of the gold standard.
4. What underlying tension led to the dissolution of the Bretton Woods agreement?
5. Outline how the foreign exchange rate is determined under (a) a freely fluctuating exchange standard and (b) the gold standard.
6. Explain Hume's gold-flow mechanism. To what extent could this mechanism be expected to work in the real world, assuming the world was on a classical gold standard?
7. Using supply-and-demand analysis, explain how the exchange rate is determined in a world with floating exchange rates. What determines the supply and demand?
8. What two important organizations for helping international trade were established at the end of World War II? Discuss the main functions of each. Appraise their respective contributions to international stability in the postwar period.