CHAPTER 2

THE DETERMINATION OF EXCHANGE RATES

The purpose of this chapter is to explain what an exchange rate is and how it is determined in a *freely-floating* exchange rate regime, that is, in the absence of government intervention. This is done using a simple two-country model. Because of its pervasiveness, we also examine the different forms and consequences of central bank intervention in the foreign exchange markets. Since an exchange rate can be considered as the relative price of two financial assets, the chapter discusses the asset market model of currencies and the role of expectations in exchange rate determination. A separate section discusses the real changes in a nation's economy that cause exchange rate changes.

KEY POINTS

1. Absent government intervention, exchange rates respond to the forces of supply and demand, which, in turn, depend on relative inflation rates, interest rates, and GNP growth rates.

2. Monetary policy is crucial. If the central bank expands the money supply at a faster rate than money demand, the purchasing power of money declines both at home (inflation) and abroad (currency depreciation).

3. The healthier the economy is, the stronger the currency is likely to be.

4. Exchange rates are crucially affected by expectations of future exchange rate changes, which depend on forecasts of future economic and political conditions.

5. In order to achieve certain economic or political objectives, governments often intervene in the currency markets to affect the exchange rate. Although the mechanics of such intervention vary, the general purpose of each variant is basically the same: to increase the market demand for one currency by increasing the market supply of another. Alternatively, the government can control the exchange rate directly by setting a price for its currency and then restricting access to the foreign exchange market.

6. A critical factor which helps explain the volatility of exchange rates is that with a fiat money there is no anchor to a currency's value, nothing around which beliefs can coalesce. Since people are unsure about what to expect, any new piece of information can dramatically alter their beliefs. Thus, if the underlying domestic economic policies are unstable, exchange rates will be volatile as traders react to new information.

SUGGESTED ANSWERS TO "ASIAN CURRENCIES SINK IN 1997"

1. What were the origins of the Asian currency crisis?

ANSWER. The case suggests several causes of the Asian currency crisis. First was the loss of export competitiveness. A number of Asian countries had tied their currencies to the dollar, so the dramatic appreciation of the dollar against the yen, Deutsche mark and other currencies made their exports were less price competitive. Their competitiveness problem was greatly exacerbated by the fact that during this period, the Chinese yuan depreciated by about 25% against the dollar. A second contributing factor to Asia's financial problems was moral hazard–the tendency to incur risks that one is protected against. Specifically, most Asian banks and finance companies operated with implicit or explicit government

guarantees. When combined with poor regulation, these guarantees distorted investment decisions, encouraging financial institutions to fund risky projects in the expectation that the banks would enjoy any profits, while sticking the government with any losses. Without market discipline or risk-based bank lending, the result was overinvestment–financed by vast quantities of debt–and inflated prices of assets in short supply, such as land. The Asian financial crisis then was touched off when local investors began dumping their own currencies for dollars and foreign lenders refused to renew their loans to Asian companies and banks.

2. What role did expectations play in the Asian currency crisis?

ANSWER. Expectations were critical in causing the financial bubble and then popping it. Specifically, the Asian financial bubble persisted as long as people believe the government can honor its implicit guarantee. However, this guarantee brings with it the seeds of its own demise as inevitable glut of real estate and excess production capacity leads to large amounts of nonperforming loans and widespread loan defaults. When reality strikes, and investors realize that the government doesn't have the resources to bail out everyone, asset values plummet and the bubble is burst. The decline in asset values triggers further loan defaults, causing a loss of the confidence on which economic activity depends. Investors also worry that the government will try to inflate its way out of its difficulty. The result is a self-reinforcing downward spiral and capital flight. As foreign investors refuse to renew loans and begin to sell off shares of overvalued local companies, capital flight accelerates and the local currency falls, increasing the cost of servicing foreign debts. Local firms and banks scramble to buy foreign exchange before the currency falls further, putting even more downward pressure on the exchange rate. This story explains why stock prices and currency values declined together and why Asian financial institutions were especially hard hit. Moreover, this process is likely to be contagious, as investors search for other countries with similar characteristics. When such a country is found, everyone rushes for the exit simultaneously and another bubble is burst, another currency is sunk. In the case of the Asian currency crisis, investors also realized that their loss of export competitiveness gave the Asian central banks a mutual incentive to devalue their currencies to try to regain their export competitiveness. According to one theory, recognizing these altered incentives, speculators attacked the East Asian currencies almost simultaneously and forced a round of devaluations.

3. How did the appreciation of the U.S. dollar and depreciation of the yuan affect the timing and magnitude of the Asian currency crisis?

ANSWER. Sooner or later, the moral hazard associated with implicit government guarantees of reckless investments will result in a crisis. What dollar appreciation and yuan depreciation did was to speed up the crisis. Specifically, the loss of export competitiveness slowed down Asian growth and caused utilization rates–and profits–on huge investments in production capacity to plunge. It also gave the Asian central banks a mutual incentive to devalue their currencies to try to regain their export competitiveness.

4. What is moral hazard and how did it help cause the Asian currency crisis?

ANSWER. As explained above, moral hazard is the tendency to incur risks that one is protected against. The origin of the moral hazard faced by Asian countries were the implicit or explicit government guarantees that most Asian banks and finance companies operated with. When combined with poor regulation, these guarantees distorted investment decisions, encouraging financial institutions to fund risky projects in the expectation that the banks would enjoy any profits, while sticking the government with any losses. Without market discipline or risk-based bank lending, the result was overinvestment–financed by vast quantities of debt–and inflated prices of assets in short supply, such as land. The Asian financial crisis then was touched off when local investors began dumping their own currencies for dollars and foreign lenders refused to renew their loans to Asian companies and banks.

5. Why did so many East Asian companies and banks borrow dollars, yen, and Deutsche marks instead of their local currencies to finance their operations? What risks were they exposing themselves to?

ANSWER. East Asian banks and companies financed themselves with dollars, yen, and Deutsche marks–some $275 billion worth, much of it short term–because dollar and other foreign currency loans carried

lower interest rates than did their domestic currencies. The risk they were exposing themselves—a risk that manifested itself—was that their local currencies would devalue against the borrowed foreign currencies, making these foreign currency loans more expensive to pay back in terms of their local currencies. This risk was also borne by the banks that made these foreign currency loans, since a company that goes bankrupt because it cannot repay its loans will eventually pass its loan losses on to its lenders.

SUGGESTED ANSWERS TO "ARGENTINA'S BOLD CURRENCY EXPERIMENT AND ITS DEMISE"

1. What was the impetus for Argentina's currency board system?

ANSWER. Argentina had suffered for decades from a vicious cycle of inflation and devaluation. The currency board system was an attempt to break that cycle and help stimulate economic growth. It would also ensure that the government could no longer print money to finance a budget deficit. By effectively locking Argentina into the U.S. monetary system, the currency board system mandated by the Convertibility Act had remarkable success in restoring confidence in the peso and providing an anchor for inflation expectations.

2. How successful was Argentina's currency board?

ANSWER. The object of the currency board was to end the inflation-devaluation cycle that had plagued Argentina for some 50 years. From that standpoint, the currency board succeeded. It spurred rapid economic growth, led to a rock-solid currency, and ended hyperinflation. The peso was fixed at one dollar and inflation plummeted, falling from more than 2,300% in 1990 to 170% in 1991 and 4% in 1994. By 1997, the inflation rate was 0.4%, among the lowest in the world. Argentine capital transferred overseas to escape Argentina's hyperinflation began to come home. In response to the good economic news, stock prices quintupled, in dollar terms, during the first year of the plan.

3. What led to the downfall of Argentina's currency board?

ANSWER. The downfall of Argentina's currency board stems from a series of external shocks and internal problems that were suffered by the Argentine economy and that the economy was unable to adapt to. External shocks included falling prices for its agricultural commodities, the Mexican peso crisis in late 1994, the Asian currency crisis of 1997, and the Russian and Brazilian financial crises of 1998-1999. The financial shocks led investors to reassess the risk of emerging markets and to withdraw their capital from Argentina as well as the countries in crisis. The devaluation of the Brazilian real in early 1999–which increased the cost of Argentine goods in Brazil and reduced the cost of Brazilian goods to Argentines–hurt Argentina because of the strong trade ties between the two countries. Similarly, the strong appreciation of the dollar in the late 1990s, made Argentina's products less competitive, both at home and abroad, against those of its trading partners whose currencies were not tied to the dollar. Internal problems revolved around rigid labor laws that make it costly to lay off Argentine workers and excessive spending by the Argentine government. In a decade that saw GDP rise 50%, public spending rose 90%. Initially, the growth in government spending was funded by privatization proceeds. When privatization proceeds ran out, the government turned to tax increases and heavy borrowing. The result was massive fiscal deficits, a rising debt burden, high unemployment, economic stagnation, capital flights, and a restive population. Simply put, Argentina's bold currency experiment unraveled amidst political and economic chaos brought about by the failure of Argentine politicians to rein in spending and to reform the country's labor laws. In effect, forced to choose between the economic liberalization and fiscal discipline that was necessary to save its currency board and the failed economic policies of Peronism, Argentina ultimately chose the latter and wound up with a disaster.

4. What lessons can we learn from the experience of Argentina's currency board?

ANSWER. The most important lesson from Argentina's failed currency board experiment is that exchange rate arrangements are no substitute for good macroeconomic policy. The latter takes discipline and a willingness to say no to special interests. The peso and its currency board collapsed once domestic and foreign investors determined that Argentina's fiscal policies were unsound, unlikely to improve, and incompatible with the maintenance of a fixed exchange rate. Another lesson is that a nation cannot be forced to maintain a currency arrangement that has outlived its usefulness. As such, no fixed exchange rate system, no matter how strong it appears, is completely sound and credible.

SUGGESTED ANSWERS TO "THE U.S. DOLLAR SELLS OFF"

1. How did China and Japan manage to weaken their currencies against the dollar?

ANSWER. China and Japan intervened in the foreign exchange market to weaken their currencies against the dollar. Specifically, the Chinese and Japanese central banks issued additional yuan and yen, respectively, and used this money to buy an equivalent amount of dollars. By expanding the supply of yen and yuan and increasing the demand for dollars, both countries managed to hold down the value of their currencies against the dollar. China and Japan then used the dollars they acquired through their foreign exchange intervention to buy U.S. Treasury bonds.

2. Why did the U.S. dollar and U.S. Treasury bonds fall in response to the G7 statement?

ANSWER. The G7 endorsed "flexibility" in exchange rates, a code word widely regarded as an encouragement for China and Japan to stop managing their currencies. If China and Japan accepted this advice, they would cease their purchases of dollars. Such an action would reduce the value of the dollar. At the same time, the reduced purchases of dollars would cause China and Japan to make fewer purchases of U.S. Treasury bonds, thereby reducing the demand for Treasury bonds. A reduced demand for U.S. Treasury bonds would lead to a drop in their value. Both the dollar and U.S. Treasury bonds fell on the G7 announcement based on the expectation that China and Japan might accept the G7 advice.

3. What is the link between currency intervention and China and Japan buying U.S. Treasury bonds?

ANSWER. As noted above, China and Japan acquired the dollars they used to buy U.S. Treasury bonds through their foreign exchange market intervention. The more these countries intervened in the foreign exchange market, the more dollars they would have to buy Treasury bonds. Conversely, ceasing such intervention would mean these countries would no longer have the dollars to buy Treasury bonds.

4. What risks do China and Japan face from their currency intervention?

ANSWER. In order to intervene in the foreign exchange market, China and Japan have to expand their domestic money supplies. The danger is that this rising money supply will cause inflation. Another risk is that other countries will engage in competitive devaluations to boost their export competitiveness vis-à-vis the Chinese and Japanese. Finally, China and Japan face the very real danger that their cheap currency policy will stir up protectionist measures in its trading partners.

SUGGESTED ANSWERS TO "A YEN FOR YUAN"

1. Why is China trying to hold down the value of the yuan? What evidence suggests that China is indeed pursing a weak currently policy?

ANSWER. China believes that it needs to export in order to keep people employed and provide jobs, as state enterprises become obsolete and close down. The government worries that a large body of unemployed people would lead to unrest. Evidence that a weak yuan policy is being pursued shows up in the peg to the

dollar being maintained despite the weakening of the dollar. The existence of the peg is evident from the fixed exchange rate and the large quantity of dollars the government is buying up to support the dollar against the yuan (as seen in the jump in China's foreign exchange reserves in recent years).

2. What benefits does China expect to realize from a weak currency policy?

ANSWER. China hopes that flourishing export businesses will be able to absorb newly unemployed people from state enterprises that are being shut down. In addition, a perceived potential deflation can be averted by maintaining a weak yuan (which raises the price of foreign goods) and expanding the yuan money supply in pursuit of this policy.

3. Other things being equal, what would a 27.5% tariff cost American consumers annually on $200 billion in imports from China?

ANSWER. Other things being equal, American consumers would pay an additional $55 billion on such imports (0.275 x $200 billion).

4. Currently, imports from China account for about 10% of total U.S. imports. A 25% appreciation of the yuan would be the equivalent of what percent dollar depreciation? How significant would such a depreciation likely be in terms of stemming America's appetite for foreign goods?

ANSWER. All else being equal, if the yuan appreciates by 25%, the dollar cost of Chinese goods would rise by the same percent. With Chinese imports accounting for about 10% of total U.S. imports, a 25% yuan appreciation would increase the dollar cost of U.S. imports by about 2.5% overall. This figure represents an approximate 2.5% dollar depreciation. (1 - 1/1.025 = -2.439% to be exact).

5. What policy tools is China using to maintain the yuan at an artificially low level? Are there any potential problems with using this policy tool? What might China do to counter these problems?

ANSWER. The policy tool used to maintain the yuan at an artificially low level is keeping the yuan pegged to the dollar by issuing more yuan to buy up dollars. The problem with maintaining the weak value is a rising money supply. A rapidly expanding money supply results in inflation. In China's case, this inflationary pressure is most noticeable in asset prices. To cope with this problem, and the attendant asset price bubbles, the Chinese government could sterilize its foreign exchange intervention, but that is likely to result in continuing pressure on the yuan to appreciate. It will also lead to higher interest rates as the government sells more bonds, driving down bond prices (interest rates and bond prices move in opposite directions). Alternatively, as suggested in the answer to part 6, China could free its currency and allow capital outflows, which would absorb at least some of the pressure to appreciate. Ultimately, China will have to allow the yuan to appreciate.

6. Does an undervalued yuan impose any cost on the Chinese economy? If so, what are they?

ANSWER. An undervalued yuan raises the cost of foreign goods and services to Chinese consumers and companies, reducing their purchasing power overseas. Another potential cost of pursuing a cheap currency policy is the possibility of stirring up protectionist measures in its trading partners. Conversely, revaluing the yuan would aid the Chinese government in tackling domestic inflation and asset bubbles.

7. Suppose the Chinese government were to cease its foreign exchange market intervention and the yuan climbed to five to the dollar. What would be the percentage gain to the dollar investor?

ANSWER. In this scenario, the value of the yuan would rise from $0.1208 (1/8.28) to $0.20 (1/5). The resulting gain in dollar value is (0.20 – 0.1208)/0.1208 or 65.6%.

8. Currently the yuan is not a convertible currency, meaning that Chinese individuals are not permitted to exchange their yuan for dollars to invest abroad. Moreover, companies operating in China must convert all their foreign exchange earnings into yuan. Suppose China were to relax these currency

controls and restraints on capital outflows. What would happen to the pressure on the yuan to revalue? Explain.

ANSWER. Relaxing currency controls and constraints on capital outflows would result in increased capital outflows and an increase in the demand for foreign currency. Other things being equal, this increased demand for foreign exchange would reduce the pressure on the yuan to revalue and could even result in a depreciation of the yuan if the demand for foreign assets (for diversification and investment purpose, say) were sufficiently great.

9. In 2011, six years later, the U.S. Senate was again considering a bill that would punish China for suppressing the value of its currency to give its exports a competitive advantage. Why have both the Bush and Obama administrations, one Republican and the other Democratic, resisted such legislation? Is it likely that this proposed legislation has had any effect on China's exchange rate policy?

Answer. Both Presidents Bush and Obama were likely concerned about the possibility of a trade war erupting over such legislation. They both also were probably advised by their economists that the U.S. trade deficits are caused by the savings imbalances between China and the United States, not by an artificially depressed exchange rate. Finally, they probably were concerned about leaning too hard on China to let the yuan rise in value lest that risk a rupture with America's biggest creditor at a time of record budget deficits. It is likely that this proposed legislation has affected China's exchange rate policy as the crawling peg was adopted on July 21, 2005, just four months after the legislation was introduced. Similarly, the float adopted on June 20, 2010 followed additional noises about the legislation being reintroduced in Congress.

SUGGESTED ANSWERS TO CHAPTER 2 QUESTIONS

1. Describe how these three typical transactions should affect present and future exchange rates.

a. Joseph E. Seagram & Sons imports a year's supply of French champagne. Payment in euros is due immediately.

ANSWER. The euro should appreciate relative to the dollar since demand for euros is rising.

b. MCI sells a new stock issue to Alcatel, the French telecommunications company. Payment in dollars is due immediately.

ANSWER. The spot value of the dollar should increase as Alcatel demands dollars to pay for the new stock issue. The future value of the dollar should decline as dividend payments are sent to Alcatel and other Alcatel equipment and parts are imported. However, the value of the dollar in the future could increase if expanded MCI output substitutes for telecom imports.

c. Korean Airlines buys five Boeing 747s. As part of the deal, Boeing arranges a loan to KAL for the purchase amount from the U.S. Export-Import Bank. The loan is to be paid back over the next seven years with a two-year grace period.

ANSWER. The spot price of the dollar should be unaffected. The future price of the dollar should increase as KAL repays the loan.

2. The maintenance of money's value is said to depend on the monetary authorities. What might the monetary authorities do to a currency that would cause its value to drop?

ANSWER. The value of any good or asset is driven by its scarcity. What the monetary authorities could do is to make money less scarce by issuing more of it. This would lower its scarcity value. Even though its nominal value will always be the same, the added supply will reduce the purchasing power per unit of money.

3. For each of the following six scenarios, say whether the value of the dollar will appreciate, depreciate, or remain the same relative to the Japanese yen. Explain each answer. Assume that exchange rates are free to vary and that other factors are held constant.

a. The growth rate of national income is higher in the United States than in Japan.

ANSWER. The value of the dollar should rise as more rapidly rising GNP in the United States leads to a relative increase in demand for dollars.

b. Inflation is higher in the U.S. than in Japan.

ANSWER. The value of the dollar should fall in line with purchasing power parity.

c. Prices in Japan and the United States are rising at the same rate.

ANSWER. According to PPP, the exchange rate should remain the same.

d. Real interest rates are higher in the United States than in Japan.

ANSWER. The value of the dollar should rise as the higher real rates attract capital from Japan that must first be converted into dollars.

e. The United States imposes new restrictions on the ability of foreigners to buy American companies and real estate.

ANSWER. The value of the dollar should fall as foreigners find it less attractive to own U.S. assets.

f. U.S. wages rise relative to Japanese wages, and American productivity falls behind Japanese productivity.

ANSWER. Higher U.S. wages and declining relative productivity weaken the American economy and make it less attractive for investment purposes. Assuming that a weak economy leads to a weak currency, the dollar will fall. From a somewhat different perspective, when a nation's productivity growth lags behind that of its major trading partners, the other countries will become more depreciating currency is the market's way of restoring balance. The lagging country regains its balance, but only by accepting a lower real price for its goods. In effect, the cheaper currency is the market's way of cutting wages in the lagging country.

4. The Fed adopts an easier monetary policy. How is this likely to affect the value of the dollar and U.S. interest rates?

ANSWER. If the Fed switches to an easier monetary policy, the value of the dollar will drop as fears of inflation rise. Short-term U.S. interest rates will initially fall but will then rise as investors seek to protect themselves from higher anticipated inflation. Long-term rates will probably rise immediately because of fears of future inflation. Over time, however, if the growth in the money supply stimulated the economy to grow more rapidly than it otherwise would, the value of the dollar could rise, and so could real interest rates. This is an unlikely scenario, however, as indicated by the experiences of Latin American nations.

5. Comment on the following headline from *The New York Times*. "Germany Raises Interest Rate, and Value of Dollar Declines" (October 10, 1997).

ANSWER. The increase in German interest rates made German assets more attractive to investors. In the process of shifting funds from the United States to Germany, investors sold dollars to buy the DM they needed to invest in German assets. An alternative--and consistent--explanation is that the rise in interest rates reflected a tightening of German monetary policy, leading investors to anticipate less German inflation in the future, which would increase their desire to hold DM and thereby boost its value.

6. In the 1995 election for the French presidency, the Socialist candidate, Lionel Jospin, vowed to halt all privatizations, raise taxes on business, spend heavily on job creation, and cut the work week without a matching pay cut. At the time Mr. Jospin made this vow, he was running neck-and-neck with the conservative Prime Minister Jacques Chirac, who espoused free-market policies.

a. How do you think the French franc responded to Mr. Jospin's remarks?

ANSWER. Mr. Jospin's policies reflect economic insanity--calculated to destroy economic incentives to invest, hire people, and promote economic efficiency--which would be bad news for the franc. As expected, the franc fell on his remarks.

b. In the event, Mr. Chirac won the election. What was the franc's likely reaction?

ANSWER. Positive, because it reduced the likelihood of the implementation of Mr. Jospin's policies.

7. On November 28, 1990, Federal Reserve Chairman Alan Greenspan told the House Banking Committee that despite possible benefits to the U.S. trade balance, "a weaker dollar also is a cause for concern." This statement departed from what appeared to be an attitude of benign neglect by U.S. monetary officials toward the dollar's depreciation. He also rejected the notion that the Fed should aggressively ease monetary policy, as some Treasury officials had been urging. At the same time, Mr. Greenspan didn't mention foreign exchange market intervention to support the dollar's value.

a. What was the likely reaction of the foreign exchange market to Mr. Greenspan's statements. Explain.

ANSWER. The dollar rose when Chairman Greenspan indicated that he was concerned about the dollar's slide and would not aggressively ease monetary policy. Investors responded to his statement by lowering their expectations about future U.S. inflation, making dollars a more desirable asset.

b. Can Mr. Greenspan support the value of the U.S. dollar without intervening in the foreign exchange market? If so, how?

ANSWER. Yes. By tightening U.S. monetary policy, he can lower investor expectations about future U.S. inflation and raise real U.S. interest rates (at least temporarily). Both these effects of tighter monetary policy will boost the dollar's value.

8. Many Asian governments have attempted to promote their export competitiveness by holding down the values of their currencies through foreign exchange market intervention.

a. What is the likely impact of this policy on Asian foreign exchange reserves? on Asian inflation? on Asian export competitiveness? on Asian living standards?

ANSWER. In order to hold down the value of their currencies, Asian central banks must buy up foreign exchange in the market. The result is increased foreign reserves and an expanded domestic money supply, which has the potential to increase inflation. At the same time, the lower exchange rates boosts Asian export competitiveness, but at the expense of a lower living standards for their populations (who find foreign goods and services more expensive).

b. Some Asian countries have attempted to sterilize their foreign exchange market intervention by selling bonds. What are the likely consequences of sterilization on interest rates? on exchange rates in the longer term? on export competitiveness?

ANSWER. In order to sterilize the expanded domestic money supply resulting from the purchase of foreign exchange, the Asian central bank must sell government securities to the market. These sales would drive down the price of government bonds and drive up domestic interest rates. Higher interest rates, in turn,

would attract more foreign capital, which would boost the value of the domestic currency. Thus, in the long run, sterilized intervention will not effect exchange rates and export competitiveness.

9. As mentioned in the chapter, Hong Kong has a currency board that fixes the exchange rate between the U.S. and HK dollars.

a. What is the likely consequence of a large capital inflow for the rate of inflation in Hong Kong? For the competitiveness of Hong Kong business? Explain.

ANSWER. As capital flows in, the currency board must exchange the foreign currency for an equivalent amount of Hong Kong dollars. The rise in the supply of HK dollars will lead to a higher rate of inflation. Combined with the fixed exchange rate, the rise in the inflation rate will result in an increase in the real exchange rate, making Hong Kong business less competitive.

b. Given a large capital inflow, what would happen to the value of the Hong Kong dollar if it were allowed to freely float? What would be the effect on the competitiveness of Hong Kong business? Explain.

ANSWER. Given a freely-floating Hong Kong dollar, all else being equal, a large capital inflow would cause the HK dollar to appreciate. As with a currency board, the resulting appreciation in the real value of the HK dollar would make Hong Kong business less competitive.

c. Given a large capital inflow, will Hong Kong business be more or less competitive under a currency board or with a freely-floating currency? Explain.

ANSWER. In both instances, the HK dollar will rise in real terms. However, the ways in which the real exchange rate change occurs will differ. With a currency board, the real exchange rate change will be brought about by the higher inflation that Hong Kong will experience, whereas with a free float it will be brought about by a rise in the nominal exchange rate. Indeed, the appreciation of a freely-floating HK dollar will actually cause Hong Kong inflation to fall by reducing the cost of imports. The lower inflation rate will offset some of the loss of competitiveness brought about by the appreciating HK dollar. All else being equal, therefore, a large capital inflow would seem to harm Hong Kong business more under a currency board than with a freely-floating currency. Because of this deflationary impact, however, the rise in the nominal exchange will likely be larger than it otherwise might be to balance the supply and demand for HK dollars. In general, the net effect is likely to be the same since it depends only on the demand for HK dollars and the demand is not affected by the different ways in which that demand is satisfied.

10. In 1994, an influx of drug money to Colombia coincided with a sharp increase in its export earnings from coffee and oil.

a. What was the likely impact of these factors on the real value of the Colombian peso and the competitiveness of Colombia's legal exports? Explain.

ANSWER. The sharp increase in earnings from drug dealing, coffee, and oil led--as expected--to an appreciation in the real value of the Columbian peso during 1994 (30% against the dollar) by boosting the demand for pesos in the foreign exchange market (as dollar earnings were converted into pesos). This real appreciation reduces the competitiveness of Columbia's legal exports.

b. In 1996, Colombia's president, facing charges of involvement in his country's drug cartel, sought to boost his domestic popularity by pursing more expansionist monetary pollicies. Standing in the way was Colombia's independent central bank - Banco de la Republica. In response, the president and his supporter discussed the possibility of returning central bank control to the executive branch. Describe the likely economic consequences of ending Banco de al Republica's independence.

ANSWER. A sharp and continuing increase in the money supply would lead to hyper-inflation and lower popularity for the president.

ADDITIONAL CHAPTER 2 QUESTIONS AND ANSWERS

1. Suppose prices start rising in the United States relative to prices in Japan. What would we expect to see happen to the dollar:yen exchange rate? Explain.

ANSWER. As U.S. prices start rising relative to Japanese prices, both American and Japanese consumers will start substituting Japanese for U.S. goods, leading to increases in both the supply of U.S. dollars and the demand for Japanese yen. The result will be a depreciation of the dollar.

2. If a foreigner purchases a U.S. government security, what happens to the supply of, and demand for, dollars?

ANSWER. In order to purchase a U.S. government security, the foreigner must first acquire dollars. This increases the demand for dollars, but has no affect on the supply of dollars.

3. In 1987, the British government cut taxes significantly, raising the after-tax return on investments in Great Britain. What would be the likely consequence of this tax cut on the equilibrium value of the British pound?

ANSWER. The cut in British tax rates should raise after-tax returns, making investment in England more attractive to both British and foreign investors. In response, investors should demand more pounds to acquire the now more lucrative more British assets, driving up the value of the pound. This is, in fact, what happened.

4. Some economists have argued that a lower government deficit could cause the dollar to drop by reducing high real interest rates in the United States. What does the asset view of exchange rates predict will happen if the United States lowers its budget deficit? What is the evidence from countries such as Mexico and Brazil?

ANSWER. The impact of a reduction in the budget deficit on the value of the dollar depends on how that deficit reduction is accomplished. The key according to the asset-market model is whether the mechanism used leads to a healthier or weaker economy. If the government reduces the deficit by raising taxes, economic incentives to work and invest will diminish, thereby hurting economic growth and the dollar. By contrast, deficit reduction brought about by a cut in government spending would signal a sensible economic policy and the dollar would rise. Another factor is also relevant here. Lower deficits owing to a reduction in spending would convince foreigners that the chances for future inflation in the U.S. had decreased. This would make dollar investments look even better, further strengthening the dollar. As mentioned in the text, if high government deficits increased a currency's value, then Mexico and Brazil should have two of the strongest currencies in the world today.

5. What is there about a fiat money that makes its exchange rate especially volatile?

ANSWER. With a fiat money there is no anchor to a currency's value, nothing around which beliefs can coalesce. In this situation, where people are unsure what to expect, any new piece of information can dramatically alter their beliefs about currency values. As people change their views of what the future holds, they change the price at which they are willing to hold the existing stock of currency.

6. Comment on the following headlines in *The Wall Street Journal*:

a. "Sterling Drops Sharply Despite Good Health of British Economy: Oil Price Slump Is Blamed" (January 17, 1985).

ANSWER. The value of the pound is very sensitive to the price of oil because England has large North Sea oil reserves and is a major oil exporter. Hence, British wealth is positively related to the price of oil. Any event that reduces a nation's wealth will also tend to drive down the value of its currency. The health of the British economy was already factored into the value of the pound. The new information about the price of oil drove down the pound's value because it indicated that British wealth would be lower than was previously expected.

b. "Dollar Surges as Coup in Soviet Union Revives Unit's Appeal as a Safe Haven" (August 20, 1991).

ANSWER. With the reduction in world tension occasioned by the decline in Communism's appeal in the Soviet Union, investors had less need for the U.S. dollar as a safe haven. The Soviet coup brought back the threat of Soviet militarism and led investors to desire once again to hold an increased share of their wealth in dollars. This increased demand for dollars led to the dollar's surge in value.

c. "Dollar Plummets on Soviet Coup Failure" (August 22, 1991).

ANSWER. As the threat of Soviet militarism once again faded with the failure of the Soviet coup, investors refused to continue paying the safe-haven premium they had previously been willing to pay. As investors shifted their demand from dollars to other currencies, the dollar reversed its previous runup.

d. "Dollar Falls Across the Board as Fed Cuts Discount Rate to 6.5% From 7% (December 19, 1990).

ANSWER. There are two possible reasons for the fall in the dollar. One possibility is that the Fed's cut in the discount rate reduced real interest rates in the United States, reducing the attractiveness of dollar-denominated financial assets relative to assets denominated in foreign currencies. As investors shifted to non-U.S. assets, they had to first sell dollars, depressing its value. The second possibility is that the Fed's lowering of the discount rate was a harbinger of a looser U.S. monetary policy, fueling fears of higher inflation in the future. In response to higher expected U.S. inflation, the dollar fell immediately.

e. "Canadian Dollar Likely to Fall Further On Recession and Constitutional Crisis" (September 28, 1992).

ANSWER. A Canadian recession combined with the perceived political risk associated with Canada's constitutional crisis significantly reduces Canada's appeal to investors, leading to expected capital outflows and a depressed Canadian dollar. However, to the extent that this bad news has already been factored into the Canadian dollar's value--and in an efficient market it should have been--the headline is wrong; the Canadian dollar should not fall further. Otherwise, speculators can earn risk-free profits by betting against the Canadian dollar.

f. "Dollar Soars on U.S. and Iraqi Tension, Hints of Possible Lower German Rates" (December 12, 1992).

ANSWER. The combination of the desire to hold more dollars because of political fears brought about by new problems with Iraq and the reduced appeal of investing in Germany because of the possibility of lower interest rates there, led to a large increase in capital flows to the United States. These capital inflows boosted the value of the dollar.

g. "Inflation, Slow Growth Seen Spurring Latin America to Devaluate Currencies" (January 22, 1990).

ANSWER. The Latin American countries have been maintaining their currencies at an artificially high level. Inflation and slow growth increase the overvaluation of Latin American currencies, putting greater pressure on their governments to devalue their currencies.

7. Suppose a new Russian government makes threatening moves against Western Europe. How is this threat likely to affect the dollar's value? Why?

ANSWER. As investors in Western Europe become more nervous about their prospects they will try to shift out of Western European assets and into U.S. dollars and dollar-denominated assets. Since they can't all sell off their Western European assets simultaneously, the result will be a drop in the real value of Western European currencies relative to the real value of the dollar. Once the dollar has risen sufficiently, investors will again be willing to hold the existing (now devalued) stock of Western European assets, including currencies.

8. On May 11, 1995, the House Budget Committee approved a plan to slash federal spending through the year 2002 and thereby end the persistent U.S. budget deficits. How do you think the dollar responded to this news?

ANSWER. This news should be favorable for the dollar because it indicated that the United States was going to follow a sounder economy policy, which would lead to lower inflation and higher economic growth in the future. The improved economic climate would make the U.S. investment environment more desirable and lead to capital inflows, which would drive up the dollar. As predicted, the dollar rose on the news.

9. Comment on the following statement: "One of the puzzling aspects of central bank intervention is how those who manage our economic affairs think they know what is the `right' price for a dollar in terms of francs, pounds, yen, or Deutsche marks. And if they do know, why do they keep changing their minds?"

ANSWER. Here's one possible answer. Once President Nixon decided to abandon the gold standard, the dollar became just a piece of paper backed by nothing more substantial than "the full faith and trust of the United States government." Of course, we could again peg the dollar and other currencies to gold, which--as we will see in Chapter 3--would make them relatively stable. Each country would then be forced to manage its economic affairs by the straitjacket imposed by a metal whose supply doesn't vary very much. Many people would view that situation as desirable, since they would then have a pretty good idea today what the dollar would be worth tomorrow in world markets. But governments wouldn't then be able to manipulate exchange rates or money supplies to achieve other objectives. So the odds are that the powers-to-be will keep on tinkering with the dollar on the foreign exchange market while they search for the dollar's "right" price. But that still leaves unresolved a key question: How will they know when they've found the "right" price for the dollar?

10. In a widely anticipated move, on August 30, 1990, the Bank of Japan raised the discount rate (the rate it charges on loans to financial institutions) to 6% from 5.25% in a move to reduce inflationary pressures in Japan. Many currency traders had expected the Japanese central bank to raise its rate by more than 0.75%. What was the likely consequence of this interest rate rise on the yen:dollar exchange rate?

ANSWER. The key to this answer is to focus on the operative term "widely anticipated" and recognize that the foreign exchange market already factors any anticipated interest rate change, such as that by the Bank of Japan, into currency values. Thus, when the Bank of Japan hiked the interest rate by *only* 0.75%, the yen became a less desirable investment vehicle than it was before the announcement and investors sold off their yen assets. Consequently, the yen fell on August 30, 1990. In general, what moves markets is not what happens but what happens relative to what was *expected* to happen.

11. In the late 1980s, the Bank of Japan bought billions of dollars in the foreign exchange market to prop up the dollar's value against the yen. What were the likely consequences of this foreign exchange market intervention for the Japanese economy?

ANSWER. Without domestic sterilization, the increased purchase of dollars for yen led to a jump in the Japanese money supply. Initially, this increased supply of yen lowered Japanese interest rates and helped fuel what many observers have argued was a speculative rise in the Japanese stock and real estate markets. Over time, however, the higher money supply led to a rise in Japanese inflation. When the Bank of Japan responded in early 1990 to higher inflation by clamping down on the money supply, real Japanese interest rates rose and Japanese stock and real estate prices plunged.

12. Countries with high inflation need to keep devaluing their currencies to maintain competitiveness. But countries that try to maintain their competitiveness by devaluing their currencies only end up with even higher inflation. Discuss.

ANSWER. Devaluation improves competitiveness to the extent that it does not cause higher inflation. If the devaluation causes domestic wages and prices to rise, any gain in competitiveness is immediately eroded. To address the competitive consequences of devaluation, therefore, two possible cases must be distinguished: Prior to devaluation (a) the exchange rate is overvalued and (b) the exchange rate is in equilibrium. Consider, for example, a country with high inflation that tries to fix its nominal exchange rate. The currency will become overvalued and hurt local industry's competitiveness. In this case, devaluation will reduce the currency overvaluation and improve competitiveness, even though prices will rise somewhat. That is, devaluation will reduce the local currency's real exchange rate. But if the currency was in equilibrium to start with, then devaluation will occur only if monetary policy is eased. Easing will cause prices to rise (a) directly, by raising the price of imports and the goods that compete with them in the domestic market, and (b) indirectly, by forcing the central bank to expand the money supply to sustain the devaluation. Here, the real exchange rate stays the same and there is no improvement in competitiveness.

13. The Russian government is trying to figure out how to stabilize the value of its currency. What advice would you offer to it?

ANSWER. The value of the ruble depends on the available supply of rubles relative to the demand for rubles. In order to stabilize the ruble's value, the Russian government must restore the public's confidence that the ruble can be held and exchanged for something of value. That is, the Russian government must demonstrate its willingness to maintain the ruble's value. Confidence in money can only be won by controlling its supply and convincing the public that a stable currency is the only goal of monetary policy. The West Germans achieved this feat in the postwar era by giving the Bundesbank a currency-stabilization mandate and a high degree of political independence. Russia could do the same and even go one step further by creating a currency board, thereby fixing the value of the ruble to the dollar and not even establishing a central bank with discretionary money-creation authority.

14. "Unsterilized interventions are just open market operations conducted through the foreign exchange market rather than through the U.S. government securities market." Comment on this statement.

ANSWER. This statement accurately depicts the monetary consequences of unsterilized interventions. In ordinary open market operations, the central bank buys (sells) government bonds to expand (contract) the domestic money supply. Unsterilized interventions entail buying (selling) foreign exchange, which causes an increase (decrease) in the supply of domestic currency that is not offset by open market operations.

15. As the year 1992 began, the Russian government and the central bank tightened credit in an attempt to slow the growth in the supply of rubles. However, the moves weren't popular with the country's giant state-run industrial enterprises, which are still dependent on official subsidies and cheap credit. In July 1992, the Russian Parliament appointed Viktor Gerashchenko head of the central bank. One of his first acts was to say that he didn't think the time was right to make the ruble convertible. Then he said that he would continue to extend credits to bankrupt and inefficient state enterprises.

a. How independent is the Russian central bank likely to be? What political pressures is it facing?

ANSWER. The Russian central bank is unlikely to be very independent since the Russian Parliament can fire its head at will. Mr. Gerashchenko will face pressure to keep funding the bankrupt state-run industrial enterprises with newly-created money. If credit is cut off, these enterprises will go under. Their managers and workers will continue putting pressure on Parliament and the central bank to ensure their continued funding.

b. What is the likely effect of Mr. Gerashchenko's statements on inflationary expectations in Russia?

ANSWER. In effect, Mr. Gerashchenko has abdicated his control over monetary policy. The amount of money to be created will depend on the losses of state enterprises, not the amount necessary for noninflationary growth. Rational individuals will, therefore, take his statement to imply higher inflation, possibly hyperinflation.

c. How do you think the ruble:dollar exchange rate was affected by these statements?

ANSWER. The expectation of higher future inflation, combined with the central bank's unwillingness to permit ruble convertibility, should cause the ruble to fall in value, which it did. A stable, convertible currency is the cornerstone of maintaining a currency's value and Mr. Gerashchenko's statements indicated that this was not going to happen anytime soon.

d. In 1995, the Russian Central Bank signed an agreement with the International Monetary Fund not to issue cheap credits to state enterprises. How should the ruble react if the central bank sticks to its agreement with the IMF?

ANSWER. This agreement is a positive development for the ruble because it implies that the Russian Central Bank will continue to expand the supply of rubles, which is the indirect consequence of subsidizing state enterprises through bank credits. A lower rate of growth in the ruble money supply means less Russian inflation and a stronger ruble.

16. In January 1991, President Mikhail Gorbachev banned all 50-ruble and 100-ruble bills, while permitting Soviet citizens to change only 1,000 rubles in these large bills into smaller denominations. In addition, savings-bank accounts were frozen for six months. The object of these measures was to strip the country's powerful black marketeers of their operating capital, driving as many as possible out of business, and to reduce inflation, which has been running at about 80% a year. The official Russian news agency Tass reported that the government had "clearly decided that the confiscation version of monetary reform was the most efficient and least expensive version at its disposal."

a. Were these measures likely to achieve President Gorbachev's objectives?

ANSWER. These measures might drive some black marketeers out of business, but they cannot reduce inflation. Although the confiscation of large bills and freezing savings accounts will reduce the money supply, the demonstrated willingness of the government to expropriate wealth held in the form of rubles will reduce the demand for money still further. The result will be more inflation, not less. At the same time, these measures are likely to be much less effective at stripping black marketeers of their operating capital than Gorbachev thinks. Black marketeers are precisely the people who hold their wealth in gold, dollars, or other hard currencies. It is the ordinary citizens who will be (and were) most heavily penalized by Gorbachev's policies.

b. How do you think the ruble's exchange rate responded to President Gorbachev's initiative? Explain.

ANSWER. The ruble fell in value as people tried to convert their risky rubles into something, like dollars, more likely to hold its value.

17. On October 29, 1995, the Mexican government announced a new economic plan, which called for the government to boost the economy by cutting taxes and spending. The plan also included an agreement among business, labor, and government representatives to limit wage and price increases. How do you think the peso responded to this announcement? What about the Mexican stock market? Explain.

ANSWER. This plan is positive news for the Mexican economy. If lived up to, the plan implies stronger economic growth and less inflation. Both these factors should boost the Mexican stock market and the value of the peso, which happened.

18. Under the Convertibility Act, Argentina's central bank is allowed to count dollar-denominated bonds issued by the Argentine government as part of its "foreign" reserve assets. What potential problem do you see with this rule?

ANSWER. The central bank's ability to count dollar-denominated bonds issued by the Argentine government as part of its "foreign" reserve assets is a loophole big enough to drive a truck through. Under Mr. Cavallo's watchful eye, the central bank has not abused that loophole, with the so-called Bonex bonds varying between 3% and 9% of the monetary base cover. However, the central bank could alter its course overnight and expand the Bonex share of the reserves. In addition, although the Argentine government has always paid its Bonex obligations, it could refuse to honor Bonex obligations held by the central bank.

19. After the Mexican devaluation, investors questioning Argentina's ability to maintain currency convertibility began pulling their money out of Argentina. In response, the Argentine government took extraordinary steps to maintain its exchange rate at $1 per peso.

a. What were the likely consequences of this capital flight for Argentina's peso money supply? for Argentine peso interest rates? for economic growth?

ANSWER. Since Argentina maintains a currency board, it cannot sterilize the effects of currency inflows or outflows. An outflow of capital, therefore, must lead to a decline in the quantity of pesos in circulation. The immediate impact was a jump in interest rates. In turn, high real rates led to a slowdown in economic growth. However, as investors became convinced that Argentina was not going to devalue the peso, the high real interest rates began attracting capital back into Argentina, lowering real interest rates back to where they had been before. This process of arbitrage is to be expected, as Argentina's interest rates cannot diverge much from U.S. rates as long as the Argentine peso is perceived to be tied to the dollar. At the same time, the greater confidence in the value of the peso boosted business confidence and business began investing again in Argentina. The result was that economic growth picked up again after the initial fright and capital flight.

b. Why was the Argentine government so reluctant to devalue the peso?

ANSWER. Argentina saw what had happened in Mexico a month before, where peso devaluation led to higher inflation (because of the higher price of foreign goods and services), which led in turn to further devaluation and inflation. Interest rates jumped to account for the high inflation rate and loss of faith in the government's ability to maintain the peso's value. In other words, devaluation of the Mexican peso had not solved anything but rather had revived the specter of an ongoing inflation-devaluation cycle--a specter that most Mexicans hoped had disappeared during the 1980s.

c. As U.S. interest rates rise, what is likely to happen to Argentine rates? Why?

ANSWER. Since the Argentine peso is tied to the U.S. dollar at a 1:1 rate, interest rates between the two countries cannot diverge by more than a small amount. Divergence in interest rates will come only if there is a fear of peso devaluation. Otherwise, the two currencies are virtually identical and so must bear virtually identical interest rates.

20. One recommended approach to strengthen the dollar against the yen is for the U.S. Treasury to issue about $70 billion a year (the Japanese share of the U.S. trade deficit) in yen-denominated bonds. How might this move help the dollar?

ANSWER. Such a move would strengthen the dollar by providing s highly visible signal that the U.S. government is interested in a strong dollar. A weakening dollar would increase the U.S. government's cost of servicing its debt, thereby giving it a strong disincentive to talk down the dollar against the yen, which it has done on a fairly regular basis.

21. In 1993, President Carlos Salinas de Gortari proposed a bill that would formally grant the Bank of Mexico, Mexico's central bank, autonomy vis-à-vis the central government. As an investor, how would you view such a proposal? What other changes might help to amplify the signals sent by this proposal?

ANSWER. Investors, who value price stability, would view such a bill as strongly positive. Such a law would enable the Bank of Mexico to avoid financing government deficits by printing pesos and thereby improve financial discipline. The relentless printing of pesos is what has led to the ongoing inflation-devaluation cycle in Mexico. Investors would be even happier, however, if the Mexican government's ability to run budget deficits were constrained, since it is these deficits that are the driving force underlying the peso printing. Absent such constraints investors would be concerned that future deficits could lead the government to renege on its commitment to central bank independence. Unfortunately, the Bank of Mexico badly damaged its credibility when, during 1994 it appeared to collaborate with an administration facing tough elections, by pouring more pesos into the banking system. The monetary expansion kept interest rates low, which kept the economy growing, but led to the traumatic devaluation of December 1994.

22. The People's Bank of China, China's central bank, is run by bureaucrats whose prime objective seems to be funding loss-making state-owned firms. What is your prediction about the inflation outlook for China and the value of its currency, the yuan? Explain.

ANSWER. Subsidizing money-losing state firms exacerbates the Chinese government's budget deficit. These deficits, in turn, lead to inflation since they are being financed by printing additional yuan. The dilemma for Chinese policymakers is that tightening credit to the cash starved state sector, while cooling inflation pressures, will also lead to a shutdown of many state firms and throw millions out of work, which could result in social chaos.

23. In August 1994, Alan Blinder, recently appointed as vice chairman of the Federal Reserve Board, gave a talk in which he argued that the Fed should be willing to tolerate somewhat higher inflation in order to spur economic growth and job creation. The dollar fell, almost immediately. Explain the link between Dr. Blinder's views and the value of the dollar.

ANSWER. The view that the Fed should try to stimulate economic growth at the risk of somewhat more inflation is precisely the attitude that got the United States in so much trouble in the late 1960s and 1970s. By announcing, in effect, that he was "soft" on inflation, Dr. Blinder scared the financial markets because anyone who minimizes inflation's dangers is likely to make inflationary mistakes. This is particularly true if the Fed must sometimes tolerate slow growth or a recession to reduce inflationary pressures. Fed directors will not dare to be unpopular, by tightening the money supply, unless they truly believe (as Dr. Blinder seems not to) in inflation's dangers. The upshot of Blinder's comments is that they increased investors' fears that inflation would be more likely in the future, especially given the likelihood that President Clinton would appoint additional inflation "doves" to the Fed, eventually giving them a majority (with Blinder, the current vice chairman being the most likely future chairman of the Fed). Higher inflation would lead to a weaker dollar in the future. According to the expectations theory of exchange rate determination, investors will act immediately on these fears by dumping dollars, which they did, driving down the dollar now instead of later.

24. Describe the chief differences between a currency board and a central bank with a nominal exchange rate target.

ANSWER. First, the central bank controls the money supply by setting the nominal exchange rate target and then adjusting the money supply to achieve that target. Under a currency board system, there is no central bank. The currency board passively responds to the demand for domestic money by buying or selling foreign exchange for domestic currency. Hence, unlike a central bank, the board has no discretionary monetary policy. Second, a central bank need not hold any foreign currency reserves (although it usually does) whereas a currency board holds foreign exchange reserves equal to 100%, or slightly more, of its notes and coins in circulation. Third, central banks can act as a lender of last resort to banks in trouble. In contrast, since monetary authorities are not permitted to print money without the hard currency to back it, the currency board can't pump liquidity into troubled banks as most central banks would do. Most

important, the central bank can change its exchange rate target and devalue its currency. The currency board cannot since the local currency's foreign exchange rate is fixed and the currency board holds enough foreign exchange reserves to meet any speculative attack. As the currency board buys back local currency, interest rates rise and it becomes more expensive to mount a speculative attack.

25. In 1994, China sought to boost its foreign exchange reserves and stabilize the yuan (which was under pressure to appreciate) by mandating that Chinese enterprises sell all their foreign exchange to the country's commercial banks. The People's Bank of China, in turn, was forced to buy surplus foreign exchange with yuan.

a. What are the likely consequences of this policy for China's rate of inflation? Explain.

ANSWER. As the People's Bank of China buys up surplus foreign exchange, it is creating more yuan. The resulting increase in the yuan money supply, all else being equal, will increase China's rate of inflation.

b. What alternatives are open to China to achieve its attempt to simultaneously hold down the value of the yuan and curb inflation?

ANSWER. In reality, there are no alternatives for China. After creating the additional yuan through the purchase of foreign exchange, China can attempt to sterilize this increase in the money supply by selling bonds. However, by taking yuan out of circulation through sterilization, the People's Bank of China will be leaving the quantity of yuan and foreign exchange unaltered and maintain the yuan at an undervalued level (the question points out that the yuan is under pressure to appreciate, which it would do were it not for the Bank of China's willingness to create more yuan). However, by then turning around and reducing the supply of yuan, the pressure on the yuan to appreciate will remain as before. Alternatively, if the People's Bank chooses not to sterilize the increase in the yuan money supply, the result will be inflation. Thus, China cannot simultaneously maintain an undervalued currency and hold down inflation.

26. In the midst of the Asian financial crisis, Malaysia's Prime Minister Mahathir Mohamad accused an international cabal of Jewish financiers of deliberately provoking the crisis to wreck Malaysia's economy. "Jews are not happy to see Muslims prosper," he said. Following his remarks, Malaysia's financial markets and its currency, the ringgit, plunged to record lows. Explain.

ANSWER. Financial markets are not the United Nations or the Third World organization of nonaligned nations. They don't tell you that you have a point, or that they feel your pain, or that they understand your grievance because of your horrid colonial past. They listen to what you mean, not what you say, and what Dr. Mahathir's words meant to them was that he was more interested in looking for scapegoats than at the real problems. So foreign banks and investors, already spooked by Asia's currency crisis, lost even more confidence in Malaysia and began dumping the ringgit and its stocks.

27. In the 1995 election for the French presidency, the Socialist candidate, Lionel Jospin, vowed to halt all privatizations, raise taxes on business, spend heavily on job creation, and cut the work week without a matching pay cut. At the time Mr. Jospin made this vow, he was running neck-and-neck with the conservative Prime Minister Jacques Chirac, who espoused free-market policies.

    In a surprise ending to the 1997 French parliamentary elections, the Socialist party won and Mr. Jospin became Prime Minister. Given that Mr. Jospin still espoused the same policies as before, what was the likely reaction of the French franc to his election?

ANSWER. Negative, since implementation of these policies would lead to lower French growth and a weaker economy. With France being a less desirable place to invest in, one would expect capital flight and a lower franc, which occurred.

SUGGESTED SOLUTIONS TO CHAPTER 2 PROBLEMS

1. On August 8, 2000, Zimbabwe changed the value of the Zim dollar from Z$38/U.S.$ to Z$50/U.S.$.

a. What was the original U.S. dollar value of the Zim dollar? What is the new U.S. dollar value of the Zim dollar?

ANSWER. The U.S. dollar value of the Zim dollar prior to devaluation was $0.0263 (1/38). Subsequent to devaluation, the Zim dollar was worth $0.02 (1/50).

b. By what percent has the Zim dollar devalued (revalued) relative to the U.S. dollar?

ANSWER. The U.S. dollar value of the Zim dollar has changed by (0.02 - 0.0263)/0.0263 = -24%. Thus, the Zim dollar has devalued by 24% against the U.S. dollar.

c. By what percent has the U.S. dollar appreciated (depreciated) relative to the Zim dollar?

ANSWER. The U.S. dollar has appreciated against the Zim dollar by an amount equal to (50 - 38)/38 = 31.58%.

2. In 1995, one dollar bought ¥80. In 2000, it bought about ¥110.

a. What was the dollar value of the yen in 1995? What was the yen's dollar value in 2000?

ANSWER. The dollar value of the yen in 1995 was $0.0125 (1/80). By 2000, the yen had fallen to $0.00909.

b. By what percent has the yen fallen in value between 1995 and 2000?

ANSWER. Between 1995 and 2000, the yen fell by 27.27%, calculated as (0.00909 - 0.0125)/0.0125.

c. By what percent has the dollar risen in value between 1995 and 2000?

ANSWER. During this same period, the dollar appreciated by 37.5%, calculated as (110 - 80)/80.

3. On February 1, the euro is worth $0.8984. By May 1, it has moved to $0.9457.

a. By how much has the euro appreciated or depreciated against the dollar over this 3-month period?

ANSWER. Since the euro is now worth more in dollar terms, it has appreciated against the dollar. The amount of euro appreciation is (0.9457 - 0.8984)/0.1984 = 5.27%.

By how much has the dollar appreciated or depreciated against the euro over this period?

ANSWER. The flip side of euro appreciation is dollar depreciation. The dollar has depreciated by an amount equal to

$$\frac{\frac{1}{0.9457} - \frac{1}{0.8984}}{\frac{1}{0.8984}} = \frac{0.8984 - 0.9457}{0.9457} = -5.00\%$$

4. In early August 2002 (the exact date is a state secret), North Korea reduced the official value of the won from $0.465 to $0.0067. The black market value of the won at the time was $0.005.

a. By what percent did the won devalue?

ANSWER. Using Equation 2.1, the won devalued ($0.067-$0.465)/$0.465)=98.56%

Following the initial devaluation what further percentage devaluation would be necessary for the won to equal its black market value?

ANSWER. 25.4%

5. On Friday, September 13, 1992, the lira was worth DM 0.0013065. Over the weekend, the lira devalued against the DM to DM 0.0012613.

a. By how much has the lira devalued against the DM?

ANSWER. Using Equation 2.1, the lira devalued by (0.0012613 - 0.0013065)/0.0013065, or -3.46%.

b. By how much has the DM appreciated against the lira?

ANSWER. Using Equation 2.2, the DM appreciated against the lira by [(1/0.0012613) - (1/0.0013065)]/(1/0.0013065), or 3.58%.

c. Suppose Italy borrowed DM 4 billion, which it sold to prop up the lira. What were the Bank of Italy's lira losses on this currency intervention?

ANSWER. Prior to devaluation, DM billion was worth Lit (4 billion/0.0013065). Following devaluation, the DM 4 billion borrowing would cost Lit (4 billion/0.0012613) to repay. Hence, the Italian government would lose Lit 4 billion x [(1/0.0012613) - (1/0.0013065)] = Lit 109,716,164344, or DM 138,384,998 at the new exchange rate.

d. Suppose Germany spent DM 24 billion in an attempt to defend the lira. What were the Bundesbank's DM losses on this currency intervention?

ANSWER. The Bundesbank would have bought Lit 24 billion/0.0013065. Following lira devaluation, these lira would be worth DM (24 billion/0.0013065) x 0.0012613, or DM 23,169,690,012. The result is a foreign exchange loss for the Bundesbank of DM 830,309,988 on this currency intervention.

6. At the time Argentina launched its new exchange rate scheme, the euro was trading at $0.85. Exporters and importers would be able to convert between dollars and pesos at an exchange rate that was an average of the dollar and the euro exchange rates, that is, P1 = $0.50 ± 0.50.

a. How many pesos would an exporter receive for one dollar under the new system?

ANSWER. Under the new system, P1 = $0.50 + _0.50 = $0.50 + $0.85/2 = $0.925. The peso value of a dollar is thus 1/0.925, or $1 = P1.081. This exchange rate is equivalent to dollar appreciation of 8.1% against the peso.

b. How many dollars would an importer receive for one peso under the new system?

ANSWER. As shown in the answer to Part a, P1 = $0.925. This exchange rate is equivalent to peso devaluation against the dollar of 7.5%.

ADDITIONAL CHAPTER 2 PROBLEMS AND SOLUTIONS

1. In the second half of 1997, the Indonesian rupiah devalued by 84% against the U.S. dollar. By how much has the dollar appreciated against the rupiah?

ANSWER. If e_0 is the initial dollar value of the rupiah and e_1 is the post-devaluation exchange rate, then we know from Equation 2.1 that $(e_1 - e_0)/e_0 = -84\%$. Solving for e_1 in terms of e_0 yields $e_1 = 0.16e_0$. From Equation 2.2, we know that the dollar's appreciation against the rupiah equals $(e_0 - e_1)/e_1$, or $(e_0 - 0.16e_0)/0.16e_0 = 0.84/.16 = 525\%$.

2. During 1997, the U.S. dollar appreciated by 104% against the South Korean won. By how much did the won depreciate against the U.S. dollar during the year?

ANSWER. If e_0 is the initial dollar value of the South Korean won and e_1 is the post-devaluation exchange rate, then we know from Equation 2.2 that the dollar's appreciation against the won equals $(e_0 - e_1)/e_1 = 104\%$. Solving for e_1 in terms of e_0 yields $e_1 = 0.49e_0$. From Equation 2.1 we know that the won's depreciation against the dollar equals $(e_1 - e_0)/e_0$, or $(0.49e_0 - e_0)/e_0 = -51\%$. In other words, the won has depreciated by 51% against the dollar.

3. On January 1, 1975, the Mexican peso/U.S.$ exchange rate was Ps 12.5 = $1. By 1985, the exchange rate stood at Ps 208.9 = $1.

a. By how much has the Mexican peso appreciated or depreciated against the dollar over this 10-year period?

ANSWER. Over this 10-year period, the peso's dollar value has fallen from $0.08 (1/12.5) to $0.004787 (1/208.9). This change in dollar value is equivalent to a peso devaluation of 94.02% ((0.004787 - 0.08)/0.08).

b. By how much has the dollar appreciated or depreciated against the peso over this period?

ANSWER. The U.S. dollar has risen from Ps 12.5 to Ps 208.9, which is equivalent to a dollar appreciation of 1,571% ((208.9 - 12.5)/12.5).

4. Suppose the Russian ruble devalues by 75% against the dollar. What is the percentage appreciation of the dollar against the ruble?

ANSWER. The ruble is now worth 25% of its previous dollar value; that is, the dollar is now worth 4 times its previous ruble value. The ruble value of the dollar has, therefore, increased by 300% (the first 100% is its previous value).

5. Suppose the dollar appreciates by 500% against the Russian ruble. How much has the ruble devalued against the dollar?

ANSWER. The dollar is now worth six times as many rubles as before (with a 0% appreciation, the dollar would be worth 1 times as many rubles as before). This means that the ruble's dollar value is one-sixth or 16.67% of its previous value. Thus, the ruble has devalued by 83.33%.

6. In 1993, the Brazilian cruzeiro lost 95% of its dollar value. What happened to the cruzeiro value of the dollar during 1993?

ANSWER. A 95% devaluation in the dollar value of the cruzeiro is equivalent to a 1900% rise in the dollar's cruzeiro value. To see this, suppose that the exchange rate at the beginning of the year was Cr$1 = U.S.$1. A 95% devaluation of the cruzeiro is equivalent to an end-of-year exchange rate of Cr$1 = $0.05 or U.S.$1 = Cr$20. The dollar is now worth 20 times as many cruzeiros as at the start of the year, which is equivalent to a rise of 1900% in the dollar's cruzeiro value.

7. Between 1988 and 1991, the price of a room at the Milan Hilton rose from Lit 346,400 to Lit 475,000. At the same time, the exchange rate went from Lit 1,302 = $1 in 1988 to Lit 1,075 = $1 in 1991.

a. By how much has the dollar cost of a room at the Milan Hilton changed over this three-year period?

ANSWER. The dollar price of a room at the Milan Hilton in 1988 was 346,400/1,302 = $266. By 1991, that same room cost 475,000/1,075 = $442. Thus, the dollar price of a room rose during this three-year period by (442 - 266)/266 = 66.2%. This involved a combination of a 21.2% appreciation in the dollar value of the lira and a 37.1% increase in the lira price of a hotel room (1.211 x 1.371 = 1.661).

b. What has happened to the lira's dollar value during this period?

ANSWER. According to Equation 2.1, the lira's dollar value has appreciated by

$$\frac{(1/1075) - (1/1302)}{(1/1302)} = \frac{1302 - 1075}{1075} = 21.1\%$$

8. On the day that the Chancellor of the Exchequer announced independence for the Bank of England along with a boost in the base lending rate of one-quarter of a percentage point, the British stock market rose 1.4%, and British gilts rose about 2.1%. The pound rose to $1.6333 from $1.6223 and to DM2.8165 from DM2.8006.

a. Why did the British stock and bond markets jump on the news?

ANSWER. The action underscored the newly-elected Labour Party's intent to keep inflation low and eased lingering concerns that Labour might not keep its promise to embrace a market economy and leave behind its socialist past. Low inflation is good for bond markets and the promise of stronger economic growth, which is what forswearing Labour's socialist past foretold, is good for stock markets.

b. Why did the British pound appreciate on the news?

ANSWER. Just as high inflation leads to currency depreciation, so low inflation strengthens a currency. Similarly, strong economic growth boosts a currency's value as it makes for a more desirable investment location. The change in policy toward the Bank of England promised both low inflation and stronger economic growth, leading to a stronger pound.

c. What was the pound's percentage appreciation against the U.S. dollar?

ANSWER. The pound rose against the dollar by an amount equal to (1.6333 - 1.6223)/1.6223 = 0.678%.

d. What was the pound's percentage appreciation against the DM?

ANSWER. The pound rose against the DM by an amount equal to (2.8165 - 2.8006)/2.8006 = 0.568%.