

CURRENCY BOARDS FOR EASTERN EUROPE

by

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CHAPTER 1

MONETARY REFORM AND THE DEVELOPMENT OF A MARKET ECONOMY

Eastern Europe and the former Soviet Union (which we shall simply call the USSR) are struggling to throw off the shackles of socialism and to embrace capitalism. To do so successfully, they must rid themselves of their unsound currencies and establish stable, convertible currencies. The "new" currencies should be convertible into one of the major international hard currencies.

A sound currency, which is vital for a well-functioning market economy, serves as a satisfactory store of value, medium of exchange, and unit of account. An unsound currency does not fulfill any of those functions. An unsound currency is not a reliable store of value because inflation makes its value highly unpredictable. As a result, people save by hoarding bricks, timbers, food, and other commodities, which retain value better than money and other financial assets. Although commodity hoarding slows economic growth, it is rational for people in nations with unstable currencies. U.S. dollars and other stable currencies also serve as substitute stores of value in nations with unstable currencies. For example, individuals and enterprises in the USSR probably hold over \$10 billion of foreign currency, which is more than the real value of the ruble money supply. "Dollarization" is costly. It requires Soviet citizens to give up real goods and services to obtain bits of paper that Western central banks print at almost no cost, generating a perverse form of foreign aid that flows from the USSR to Western central banks.

An unsound currency is not a good medium of exchange. The outside world refuses to accept it. That impedes foreign investment and trade, and hence competition and economic growth. Nor is an unsound currency a good unit of account. Inflation distorts prices and makes business calculation more difficult. Without a good unit of account, it is impossible to make meaningful accounting calculations or to write contracts. In sum, then, an unsound currency prevents important elements of a market economy from working.

Eastern Europe and the USSR have primitive financial systems that cannot intermediate efficiently between savers and investors because their currencies are unstable and inconvertible. The status of their currencies also explains why they have limited trade with the outside world. As long as Eastern Europe and the USSR have unsound currencies, they will be unable to transform themselves into market economies.

A sound, convertible currency allows people to carry out decentralized planning, which is more efficient than central planning. In nations with so-called internally convertible currencies, all that is usually required to buy goods domestically is to have currency to pay a domestic seller. Internal convertibility implies that it is not necessary to obtain authorization from any central planner to buy or sell goods that are available inside the country. The exchange of goods is much more extensive, rapid, and efficient where internal convertibility exists, as in the United States, Germany, and Poland, than where it does not, as in Albania and the USSR.

The foreign trade counterpart of internal convertibility is external convertibility—the ability to convert as much domestic currency into foreign currency as one wishes, at market rates rather than at much higher or lower official rates. External convertibility can be unlimited, as in the major Western countries, or it can be limited, as in Czechoslovakia and Poland at present. Czechoslovakia and Poland allow most current account purchases, in which people buy foreign goods for import, but they prohibit many capital

account transactions, in which people buy foreign financial assets. Current account convertibility exposes domestic producers to foreign competition and helps introduce the structure of prices that prevails in world markets. That induces a nation to specialize in making the goods it is best at producing and then trade abroad for other goods, which increases wealth all around. Capital account convertibility helps attract foreign investment, because unless foreigners can repatriate profits they will be reluctant to invest. Foreign capital investment can offset a large current account deficit and speed the introduction of urgently needed foreign goods to modernize the economy.

The ability to purchase both domestic and foreign goods readily is what makes Western currencies fully convertible "hard" currencies, and what makes them so highly prized in Eastern Europe and the USSR. To reap the full benefits of participating in world markets, Eastern Europe and the USSR themselves need to establish fully convertible currencies. Their present monetary systems are obstacles to a market economy. Inflation is in mid double digits or higher throughout the region. In the USSR, inflation is projected to surpass 200 percent this year. Even in Poland, which has allowed most formerly subsidized prices to rise to market levels and has linked the zloty to the U.S. dollar, inflation remains above 40 percent per year.

Inflation will remain high, even in nations that follow Poland's course, because central banks in the region have no credibility. They have long histories of bowing to political pressures for inflation. For instance, the USSR has had government currency issue since 1768, and a central bank since 1860. In all that time it has had a fully convertible currency for only 35 years, the last year being 1914. All East European central banks, except in the Baltic nations and Albania, caused hyperinflations in the 1920s, and some caused hyperinflations again in the late 1940s. The new central banks established in various former Soviet republics do not have the handicap of bad past performance to undermine their credibility, but they face other problems. So far, none has announced any definite plan for keeping its currency stable. Also, the general experience of central banks in developing nations suggests that both the established central banks and the new central banks will face ferocious political pressures for inflation. For the 99 nations that the World Bank classifies as low-and middle-income, average annual inflation was 16.7 percent from 1965 to 1980 and 53.7 percent from 1980 to 1989.

This poor performance explains why Paul Volcker, the former chairman of the U.S. Federal Reserve System, has indicated that he has little faith that central banks in Eastern Europe and the USSR can achieve full convertibility. Addressing central bankers in Jackson Hole, Wyoming last year, Mr. Volcker notes that markets developed long before central banks, and stressed that Eastern Europe and the USSR might actually retard their transition to markets by relying on central banks.¹ Central banks are essentially not market institutions, which is why Marx and Engels said in the *Communist Manifesto* that one of the steps for achieving communism was "Centralization of credit in the hands of the state, by means of a national bank with state capital and an exclusive monopoly."²

To gain credibility, central banks in Eastern Europe and the USSR must painstakingly establish good track records. The lack of credibility of official promises has already led people throughout the region to conduct their own unofficial monetary reform. They have dollarized local economies. To the extent that dollars and other hard currencies are unavailable, some transactions are even taking place in barter, because barter is the only way for people to prevent domestic currency inflation from robbing them of their savings. The shift to barter is particularly disruptive in the USSR, where it is choking trade among

1 Volker 1990.

2 Marx and Engels (1848) 1948, p. 30.

republics. Making national currencies stable and convertible would revive trade among republics and among East European nations.

The problem of credibility has locked central banks and the public into a game that has no winners. Central bank promises to maintain currency stability, even by means of fixed exchange rates, are not credible. Prices will continue to rise quickly because workers will base their wage demands on established central banks' dismal past performance, or on well-founded skepticism of new central banks' promises of good behavior. State-owned enterprises and government ministries will likewise continue their free-spending ways, because they will correctly expect that the government will rescue them by forcing the central bank to print money, as has so often happened before. Workers and enterprises will anticipate that this "soft budget constraint" will continue, and they will behave accordingly.

If central banks in Eastern Europe and the USSR miraculously do maintain currency stability, the consequences could almost be worse than under continued inflation. Because the central banks lack credibility, people will remain skeptical of them for years. To gain credibility, the central banks will have to keep their currencies overvalued and keep real (inflation-adjusted) interest rates high. That may plunge national economies even deeper into depression. In such depressions, the export sector will suffer more than other sectors. That is what has happened in Yugoslavia, whose December 1989 currency reform was not completely credible. People correctly anticipated that the National Bank of Yugoslavia would not maintain the original fixed exchange rate, so real interest rates have exceeded 30 percent per year because the rates contained a large devaluation risk premium. A credible monetary reform that has *no* devaluation risk can keep real interest rates in single digits (for the least risky loans), as it is in the Western industrial nations, and hence can save Eastern Europe and the USSR much pain.

Eastern Europe and the USSR could make their currencies convertible by maintaining floating exchange rates rather than fixed rates. But though floating exchange rates balance supply and demand for domestic currency against foreign currency, they do not restrain central banks' powers to create credit. Instead, they are likely to lead to South American-style hyperinflations. Domestic political pressure groups representing the old order favor renewed inflation rather than stable money and prices. As inflation mounts, prices become increasingly unreliable indicators for guiding economic activity and the transition to a market economy becomes even more difficult because a market economy needs fairly stable prices to work well.

To have stable currencies, Eastern Europe and the USSR need to remove monetary policy from political influence. They need to give their monetary reforms instant credibility, to avoid the dangers of continuing inflation on the one hand and depression on the other hand. The best way to do so is to strip their central banks of currency issuing functions, and to establish *currency boards*, whose only job will be to issue convertible currencies according to strictly defined rules. Currency boards are explicitly designed to maintain a fixed exchange rate. Currency boards are easy to establish and operate, and they have *always* been able to maintain fixed-rate currency convertibility, even during the most trying times.

Currency boards would quickly establish hard domestic currencies and instill monetary confidence. As a result, economic agents would alter their expectations. If the U.S. dollar or the German mark were used as a currency board's reserve currency, workers could not raise wages and enterprises could not increase prices much beyond their rates of increase in the United States or Germany unless they achieved corresponding gains in productivity or quality. If governments in Eastern Europe and the USSR established secure property rights and removed barriers to foreign investment, interest rates would also be close to American or German levels. Under the currency board system, East European governments would have to finance themselves exclusively by taxation and borrowing, not by inflation, because a currency board cannot be an agent of government finance.

Linking domestic currencies to foreign currencies in Eastern Europe and the USSR would not subject the region to foreign political domination, as some people think. Rather, it would restore an element of national dignity by giving the region the sound currencies it now lacks. By establishing domestic currencies that are as sound as the foreign currencies to which they are linked, currency boards offer a way for domestic currency to become attractive as a store of value and to displace foreign currency from circulation. That would stop the perverse form of foreign aid that now flows from the region to Western central banks.

The cost of establishing 100 percent reserves against domestic currency and sufficient fractional reserves against deposits is surprisingly low in Eastern Europe and the USSR. At present market exchange rates, the real value of domestic currency and deposits throughout the region is small. The hard-currency reserves necessary to establish currency boards range from about \$70 million for Albania to perhaps \$6 billion for Poland and the USSR. Alternative estimates that claim currency boards would cost many times more are based on flawed assumptions, as we shall explain in Chapter 6.

Currency boards are essential to wider fiscal and economic reforms. With a stable monetary environment, Eastern Europe and the USSR would be able to successfully take the next steps towards a market economy.

This essay explains what a currency board is. It describes the difference between how money is supplied in a currency board system and in a central banking system. It demonstrates why the currency board system is superior to a central banking system. It also details how to establish and operate a currency board—including how to obtain the foreign currency for the board's reserves—and how to insulate the board from political pressure.



CHAPTER 2

WHAT IS A CURRENCY BOARD?

A currency board is an institution that issues notes and coins convertible into a foreign "reserve" currency³ at a fixed rate and on demand. It does not accept deposits. As reserves, a currency board holds high-quality, interest-bearing securities denominated in the reserve currency. A currency board's reserves are equal to 100 percent or slightly more of its notes and coins in circulation, as set by law. (Commercial banks in a currency board system need not hold 100 percent reserves in reserve-currency assets, however.) The board generates profits (seigniorage) from the difference between the interest earned on the securities⁴ that it holds and the expense of maintaining its note and coin circulation. It remits to its owner (historically, the government) all profits beyond what it needs to cover its expenses and to maintain its reserves at the level set by law. The currency board has no discretion in monetary policy; market forces alone determine the money supply.

As an introduction, let us briefly examine the main characteristics of a currency board. We shall discuss them in more detail later.

Convertibility: The currency board system assures that the currency will be convertible at a fixed rate. No currency board has ever had problems maintaining fixed-rate convertibility. The currency boards of Burma and North Russia even maintained fixed-rate convertibility in the midst of civil war. The currency boards of British colonies maintained convertibility during the Great Depression and (where not overrun by enemy armies) during World War II.

Reserves: A currency board's reserves are adequate to ensure that, even if all holders of notes and coins want to convert them into the reserve currency, the board will be able to do so. Currency boards have usually held reserves of 105 or 110 percent of liabilities, so that they would have a margin of protection in case the interest-earning securities that they held lost value. If a nation used the U.S. dollar or the German mark as its reserve currency, for instance, its own currency would remain as good as the dollar or the mark. Chapter 6 will discuss how to acquire the necessary reserves.

Seigniorage: Unlike securities or most bank deposits, notes and coins do not pay interest. Hence, notes and coins are like an interest-free loan from the people who hold them to the issuer. The issuer's profit equals the interest earned on reserves minus the expense of putting the notes and coins into circulation. In addition, if the notes and coins are destroyed, the issuer's net worth increases because his liabilities fall but his assets do not.

Under a currency board system, the domestic currency is as sound as the foreign reserve currency. The only economic difference between using a domestic currency issued by a board as legal tender, instead of a foreign currency, is that the seigniorage generated by a currency board issue is captured domestically; whereas, if a foreign currency is used as legal tender, the foreign issuer captures the seigniorage. The domestic seigniorage generated by a currency board can be significant. Expenses incurred by currency boards are usually about 1 percent of assets per annum. Profit rates are equal, therefore, to the in-

3 It is also possible to use a basket of currencies or gold as the reserve asset, as a few boards have done.

4 Or, for a currency board whose reserve asset is gold, interest on loans of physical gold. A well-organized market for such loans exists in London.

terest rate earned on assets minus 1 percent. Conservatively, that rate should be at least 4 percent per annum.

In addition to seigniorage, the use of a domestic currency board issue as legal tender, rather than a foreign currency, generates another domestic advantage: national pride is enhanced.

Monetary policy: By design, a currency board has no discretionary powers. Its monetary policy is completely automatic, consisting only in exchanging its notes and coins for the foreign reserve currency at a fixed rate. Since a currency board's role is strictly circumscribed, it is less likely than other monetary systems to suffer political pressures to engage in economically unsound policies.

Over sixty countries have had currency boards during this century. Most of them have been British colonies or former colonies. However, there have also been currency boards elsewhere, including two cases in Eastern Europe. A Russian currency board existed in the northern region occupied by the British and other Allies in 1918 and 1919. It issued a ruble currency having a fixed exchange rate with the British pound sterling. The free city of Danzig had a currency board from 1922 to 1923. The Danzig board too maintained a fixed exchange rate with sterling. Both East European currency boards were extremely successful during their brief lives. The North Russian board maintained convertibility in the midst of a civil war, and the Danzig board maintained convertibility despite a deep economic depression caused by the slump in Germany, its chief trading partner.⁵

Despite the success of currency boards, only a few currency board-style monetary systems exist today, most notably in Hong Kong and (in greatly modified form) in Singapore. Most other countries that once had currency boards replaced them with central banks. These changes were made for political, not economic, reasons. Politicians saw central banking as a way of manipulating the money supply to their own advantage. Since abandoning the currency board system, many of those countries have experienced inflation and economic stagnation. Hong Kong and Singapore, on the other hand, have been two of the world's most rapidly growing economies, despite their lack of natural resources. Moreover, they have realized relatively low rates of inflation.



5 Hanke and Schuler, 1990,1991.

CHAPTER 3

HOW A CURRENCY BOARD WORKS

The currency board system relies entirely on market forces to determine the amount of notes and coins that the board supplies, and also to determine the amount of deposits and other components of the broader money supply that banks and other financial institutions supply. The central bank of the reserve-currency country determines the supply of reserves in the whole currency area, including the currency board country. Competition among commercial banks determines the distribution of the reserves, including the proportion of the total that becomes the foreign-currency reserve of the currency board country. The currency board has no role in determining the supply of reserves, because its 100 percent reserve requirement makes it merely a sort of warehouse for reserves. Since a board cannot influence the amount of reserves, it cannot influence the total supply of credit. This stands in contrast to central banks, which frequently expand or contract the amount of reserves available to commercial banks in efforts to influence the supply of bank credit. However, the supply of notes and coins is elastic, because, as we shall explain, the currency board country can acquire reserves from the reserve-currency country.

As under a gold standard, or gold exchange standard, in a currency board system the amount of credit that banks can create (and hence the total money supply) is limited by their ability to acquire and keep reserves sufficient to support that amount of credit. This does not mean that credit is scarcer or carries higher real interest rates than in a central banking system; indeed, Hong Kong and Singapore are major centers of ample and efficient finance. It merely prevents a currency board system from experiencing inflation as high as is possible under the average floating exchange rate central banking system in a developing country. Under a currency board system, the currency board country stands in a similar relation to the reserve-currency country as, say, California does to the rest of the United States.

Commercial banks are middlemen between lenders (depositors) and borrowers (people who spend bank loans). A bank cannot for long grant more credit to borrowers than depositors wish to grant to it. If a bank grants excessive credit, the borrowers will spend it (for instance, by writing checks), and more funds will flow out of the bank than flow into the bank from checks written on other banks. To prevent this sort of mistake from resulting in bankruptcy, a bank needs to hold reserves. The reserves protect it from the consequences of its occasional mistakes.

The ultimate reserves in a currency board system are holdings of the foreign reserve currency. The only way to acquire new reserves, obviously, is to obtain currency from the reserve-currency country, which in its simplest form requires running a balance-of-payments surplus. Under certain simplifying assumptions that we make for the sake of clarity (see box), changes in the balance of payments change the

BALANCE-OF-PAYMENTS ASSUMPTIONS

- 1) Bank deposits are convertible into currency board notes at a fixed rate.
- 2) The ratio of notes and coins to the broader money supply (the currency-deposit ratio) is constant.
- 3) Income and money holdings move in the same direction.
- 4) There is no international branch banking between the currency board country and the reserve-currency country.
- 5) All balance-of-payments occur in the current account; the capital account did not change.
- 6) No binding minimum reserve ratios or other special bank regulations exist.
- 7) People do not hold stocks of foreign reserve currency nor do they use it in domestic transactions.

Note:As we shall explain later, only Assumption 1 is necessary for the analysis of currency boards. The other assumptions can be dropped. However, the analysis becomes more complicated then. See Ow 1985 and Walters 1987.

total domestic money supply in the same direction. A balance-of-payments surplus increases the total domestic money supply. A balance-of-payments deficit, on the other hand, decreases the total domestic money supply. Later we shall explain how under less simple, more realistic assumptions, investment inflows can enable the domestic money supply even if there is a balance-of-payments deficit. (Recall that the balance of payments is the value of exports minus the value of imports. Recall also that the domestic money supply is made up of the currency board's notes and coins in the public's hands plus commercial bank deposits.)

The easiest way to illustrate the linkage between changes in the balance of payments and the domestic money supply under a currency board system is with a combination of flow and "T-account" diagrams. The flow diagrams depict a chain of events, whereas the T accounts depict simplified balance sheets for the relevant agents under a currency board system (see Figures 1, 2, and 3).⁶ A typical currency board's T account looks like this:

Figure 1

CURRENCY BOARD

| Assets | Liabilities |
|-----------------------------|------------------------------|
| Foreign-currency securities | Notes and coins Net worth |

A typical commercial bank's T account in a currency board system looks like this:

Figure 2

COMMERCIAL BANKS

| Assets | Liabilities |
|--|---|
| Currency board notes & coins (reserves) Loans and investments | Public's deposits Stockholders' equity |

The T account of the public as a whole (meaning all of the financial sector except the currency board and the commercial banks) looks like this:

Figure 3

PUBLIC

| Assets | Liabilities |
|---|-------------------------------|
| Deposits at banks Currency board notes & coins | Loans from banks Net worth |

The total money supply is the left-hand (asset) side of the public's T account.

⁶ The account that follows draws heavily on Greenwood 1981 and 1983a.

We begin our analysis with a flow diagram (Figure 4). To start, the balance of payments is in balance and exports equal imports. We then put the system in motion by generating a balance-of-payments surplus. That surplus works its way through a currency board system in the sequence depicted in Figure 4. Notice that the currency board plays an explicit role in the chain of events depicted in Figure 4 only at the stage labeled “rise in demand for goods in general, including currency board notes and coins.”

To look at this stage in more detail, and to clarify the relationship between commercial banks and the currency board in the chain of events, we use T accounts. We use some hypothetical numbers to illustrate what happens. Let stage 1 (the starting point) be a situation where the balance of payments is zero—an equilibrium. For the sake of simplicity, we ignore net worth in the currency board’s T account, stockholders’ equity in commercial banks’ T accounts, and loans from banks and net worth in the public’s T account, assuming that they are zero. We assume that the banks have a desired deposit-to-reserve ratio of 50:1, which maximizes their risk-adjusted profits, and that the public has a desired deposit-to-currency (notes and coins) ratio of 10:1 (see Figure 5) which maximizes their convenience. For the sake of illustration, let us call the currency of the currency board country the ruble.

Figure 4

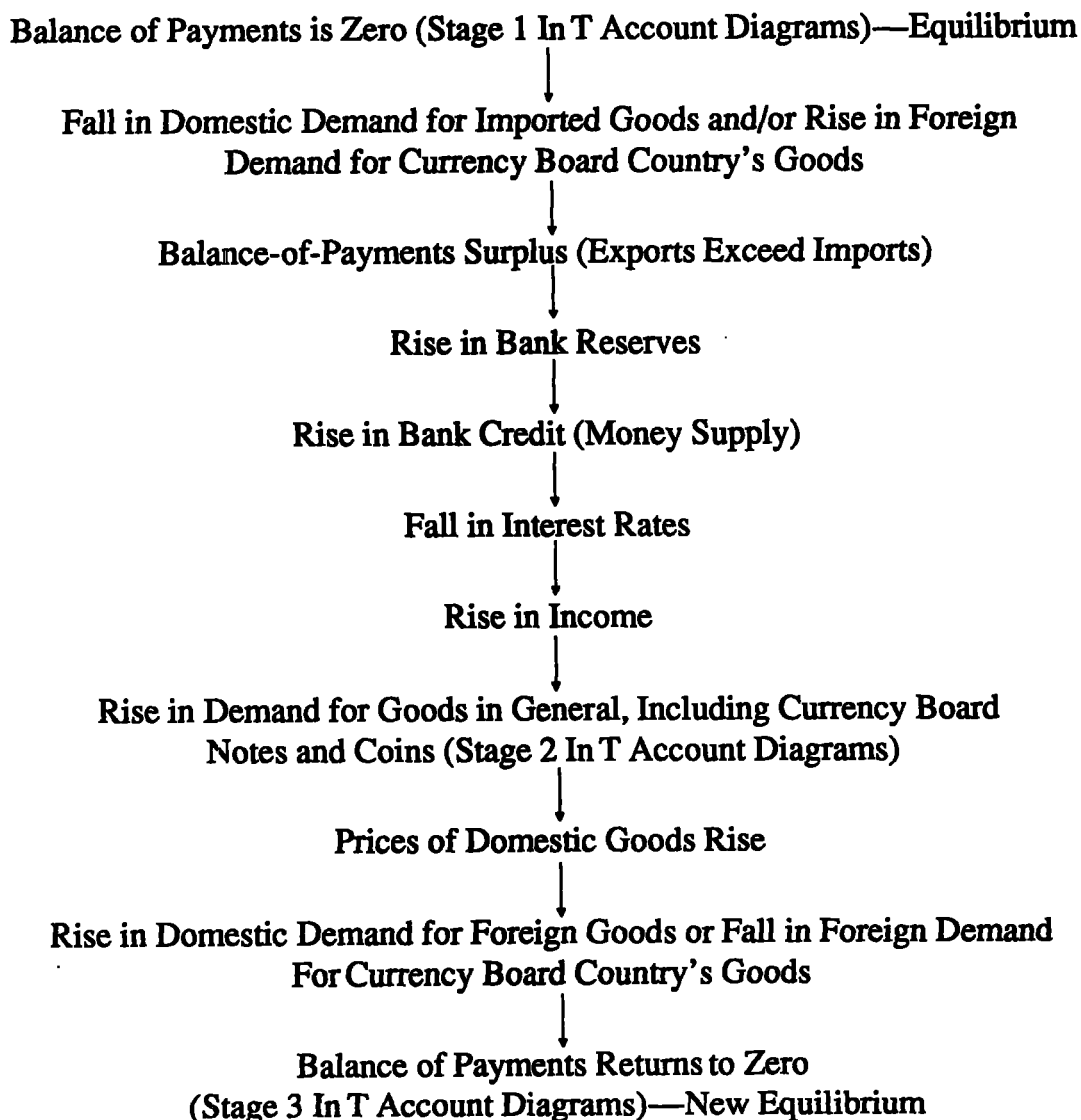


Figure 5**CURRENCY BOARD—STAGE 1**

| Assets | | Liabilities |
|-----------------------------|-----|---------------------|
| Foreign-currency securities | 600 | Notes and coins 600 |

COMMERCIAL BANKS—STAGE 1

| Assets | | Liabilities |
|---|------|------------------------|
| Currency board notes & coins (reserves) | 100 | Public's deposits 5000 |
| Loans and investments | 4900 | |

PUBLIC—STAGE 1

| Assets | | Liabilities |
|------------------------------|------|-------------|
| Deposits at banks | 5000 | |
| Currency board notes & coins | 500 | |

TOTAL MONEY SUPPLY = 5000+500 = 5500

BANKS' DEPOSIT-TO-RESERVE RATIO = 5000:100 = 50:1 (Equilibrium)

PUBLIC'S DEPOSIT-TO-CURRENCY RATIO = 5000:500 = 10:1 (Equilibrium)

Now let there be a balance-of-payments surplus of 12 rubles, in the form of foreign currency that the public deposits in local banks (see Figure 6). Since we assume, for the sake of simplicity, that banks hold all reserves in the form of currency board notes and coins, the banks exchange the foreign currency at the currency board for domestic currency. (They exchange the reserve currency at the fixed exchange rate, and other currencies at prevailing market rates.) The board's assets and liabilities become 12 rubles more than in Stage 1. The banks' reserves become 12 rubles more than in Stage 1, and the public's deposit holdings become 12 rubles more than in Stage 1. In addition, the money supply is 12 rubles more than in Stage 1. This is Stage 2.

Figure 6**CURRENCY BOARD—STAGE 2**

| Assets | | Liabilities |
|-----------------------------|-----|---------------------|
| Foreign-currency securities | 612 | Notes and coins 612 |

COMMERCIAL BANKS—STAGE 2

| Assets | | Liabilities |
|---|------|------------------------|
| Currency board notes & coins (reserves) | 112 | Public's deposits 5012 |
| Loans and investments | 4900 | |

PUBLIC—STAGE 2

| Assets | | Liabilities |
|------------------------------|------|-------------|
| Deposits at banks | 5012 | |
| Currency board notes & coins | 500 | |

TOTAL MONEY SUPPLY = 5012+500 = 5512 (expansion = 12)
 BANKS' DEPOSIT-TO-RESERVE RATIO = 5012:112 = 44.75:1 (Disequilibrium)
 PUBLIC'S DEPOSIT-TO-CURRENCY RATIO = 5012:500 = 10.024:1 (Disequilibrium)

Notice that banks' deposit-to-reserve ratio is 44.75:1 (Stage 2), which is less than their desired (Stage 1) ratio of 50:1. Notice also that the public's deposit-to-currency ratio is 10.024:1 (Stage 2), which is more than their desired (Stage 1) ratio of 10:1. That means that banks will expand their loans, and the public will expand its holdings of currency, to restore the original Stage 1 ratios. In Stage 3, they do so, achieving a new equilibrium, with the money supply 110 rubles more than in Stage 1 (see Figure 7).

Figure 7

CURRENCY BOARD—STAGE 3

| Assets | | Liabilities |
|-----------------------------|-----|---------------------|
| Foreign-currency securities | 612 | Notes and coins 612 |

COMMERCIAL BANKS—STAGE 3

| Assets | | Liabilities |
|---|------|------------------------|
| Currency board notes & coins (reserves) | 102 | Public's deposits 5100 |
| Loans and investments | 4998 | |

PUBLIC—STAGE 3

| Assets | | Liabilities |
|------------------------------|------|-------------|
| Deposits at banks | 5100 | |
| Currency board notes & coins | 510 | |

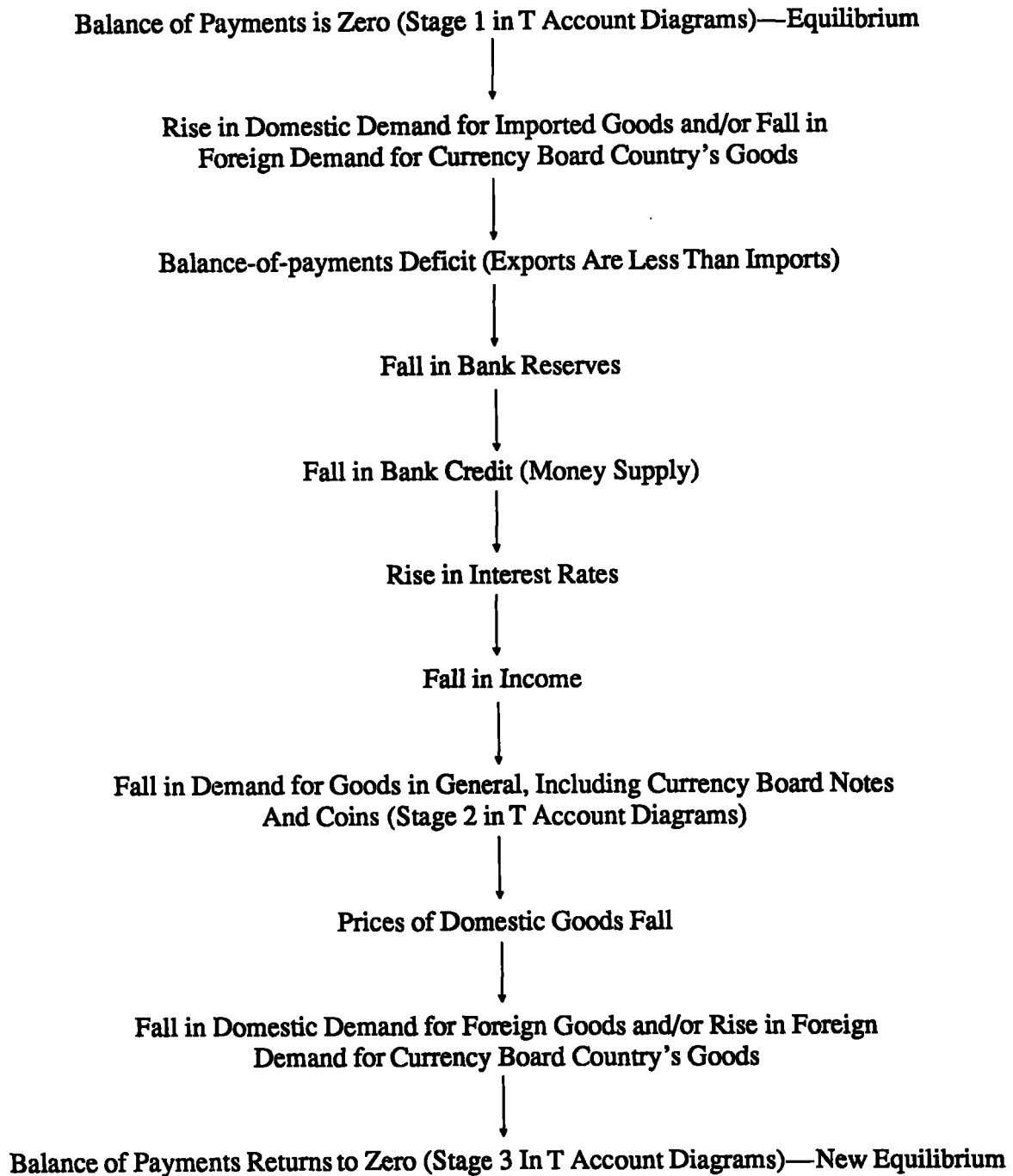
TOTAL MONEY SUPPLY = 5100 + 510 = 5610 (expansion = 110)
 BANKS' DEPOSIT-TO-RESERVE RATIO = 5100:102 = 50:1 (Equilibrium)
 PUBLIC'S DEPOSIT-TO-CURRENCY RATIO = 5100:510 = 10:1 (Equilibrium)

As the T accounts illustrate, banks' efforts to reattain their desired deposit-to-reserve ratio, and the public's efforts to reattain its desired deposit-to-currency ratio, move the currency board system back to equilibrium when a balance-of-payments surplus occurs. The currency board responds to their actions

“automatically” by virtue of its 100 percent reserve ratio and its fixed exchange rate with the foreign reserve currency.

When there is a balance-of-payments *deficit*, the money supply process works as follows:

Figure 8



Starting from an equilibrium in Stage 1 again, the T accounts are (see Figure 9):

Figure 9

CURRENCY BOARD—STAGE 1

| Assets | | Liabilities | |
|-----------------------------|-----|-----------------|-----|
| Foreign-currency securities | 600 | Notes and coins | 600 |

COMMERCIAL BANKS—STAGE 1

| Assets | | Liabilities | |
|---|------|-------------------|------|
| Currency board notes & coins (reserves) | 100 | Public's deposits | 5000 |
| Loans and investments | 4900 | | |

PUBLIC—STAGE 1

| Assets | | Liabilities | |
|------------------------------|------|-------------|--|
| Deposits at banks | 5000 | | |
| Currency board notes & coins | 500 | | |

TOTAL MONEY SUPPLY = 5000+500 = 5500

BANKS' DEPOSIT-TO-RESERVE RATIO = 5000:100 = 50:1 (Equilibrium)

PUBLIC'S DEPOSIT-TO-CURRENCY RATIO = 5000:500 = 10:1 (Equilibrium)

Now let there be a balance-of-payments deficit of 12 rubles. The public pays foreigners 12 rubles more for goods than foreigners pay the public. Foreigners will only accept payment in foreign currency, and the currency board has all the foreign currency in the financial system, so people convert 12 rubles of its notes and coins into foreign currency. They do so by withdrawing 12 rubles from their bank deposit accounts as currency board notes. Consequently, the banks' reserves become 12 rubles less than in Stage 1. People exchange the notes for foreign currency at the currency board's fixed rate, so the board's assets and liabilities become 12 rubles less than in Stage 1. This is Stage 2 (see Figure 10):

Figure 10

CURRENCY BOARD—STAGE 2

| Assets | | Liabilities | |
|-----------------------------|-----|-----------------|-----|
| Foreign-currency securities | 588 | Notes and coins | 588 |

COMMERCIAL BANKS—STAGE 2

| Assets | | Liabilities | |
|---|------|-------------------|------|
| Currency board notes & coins (reserves) | 88 | Public's deposits | 4988 |
| Loans and investments | 4900 | | |

PUBLIC—STAGE 2

| Assets | | Liabilities |
|------------------------------|------|-------------|
| Deposits at banks | 4988 | |
| Currency board notes & coins | 500 | |

TOTAL MONEY SUPPLY = 4988+500 = 5488 (contraction = 12)

BANKS' DEPOSIT-TO-RESERVE RATIO = 4988:88 = 56.68:1 (Disequilibrium)

PUBLIC'S DEPOSIT-TO-CURRENCY RATIO = 5988:500 = 9.976:1 (Disequilibrium)

Notice that banks' deposit-to-reserve ratio is 56.68:1 (Stage 2), which is more than their desired (Stage 1) ratio of 50:1. Notice also that the public's deposit-to-currency ratio is 9.976:1 (Stage 2), which is less than its desired (Stage 1) ratio of 10:1. That means that banks will contract their loans, and the public will contract its holdings of currency, to restore the original Stage 1 ratios. In Stage 3, they do so, achieving a new equilibrium, with the money supply 110 rubles less than in Stage 1 (see Figure 11):

Figure 11

CURRENCY BOARD—STAGE 3

| Assets | | Liabilities |
|-----------------------------|-----|---------------------|
| Foreign-currency securities | 588 | Notes and coins 588 |

COMMERCIAL BANKS—STAGE 3

| Assets | | Liabilities |
|---|------|------------------------|
| Currency board notes & coins (reserves) | 98 | Public's deposits 4900 |
| Loans and investments | 4802 | |

PUBLIC—STAGE 3

| Assets | | Liabilities |
|------------------------------|------|-------------|
| Deposits at banks | 4900 | |
| Currency board notes & coins | 490 | |

TOTAL MONEY SUPPLY = 4900+490 = 5390 (contraction = 110)

BANKS' DEPOSIT-TO-RESERVE RATIO = 4900:98 = 50:1 (Equilibrium)

PUBLIC'S DEPOSIT-TO-CURRENCY RATIO = 4900:490 = 10:1 (Equilibrium)

As in the case of a balance-of-payments surplus, banks' attempts to reattain their desired deposit-to-reserve ratio, and the public's efforts to reattain its desired deposit-to-currency ratio, move the currency board system back to equilibrium when a balance-of-payments deficit occurs.

There are two important points to notice about the adjustment process in a currency board system. The first is that market forces rather than central bank action set it in motion; it is completely "automatic," as far as the currency board is concerned. The second point is that, because the exchange rate is fixed, arbi-

trage occurs entirely through changes in the quantity of money, interest rates, and the balance of payments, rather than through the exchange rate. In that respect, the currency board system is like the gold standard or the gold exchange standard. The fixed exchange rate between the currency board currency and the reserve currency should make goods arbitrage between the two countries very tight, if the impediments to trade between them are small. The overall rate of price changes, as reflected in wholesale price indexes, should not differ greatly between the two countries. Interest rates also should be roughly the same in both countries, unless there are real factors such as taxes or perceived risks⁷ that make lending costlier in one country. The experience of currency board countries bears this out. In Hong Kong, for instance, interest rates and the prices of Hong Kong goods made for export have closely tracked those of the United States since Hong Kong linked its currency to the U.S. dollar in 1983.

The foregoing treatment of the mechanics of currency board money supply was simplified by some assumptions that we made (see box, page 7). If we drop all assumptions except that currency board notes and coins exchange against bank deposits at a fixed rate, the connection between the balance of payments and the money supply becomes less direct. It is even possible for the changes in money supply under a currency board system to move opposite from balance-of-payment changes. However, that is perfectly acceptable. There is no reason why the money supply in a modern fractional-reserve banking system should have a rigid relation with the balance of payments, if other factors simultaneously move the money supply in the other direction. Hong Kong and Singapore experienced balance-of-payments deficits for decades at a time, yet their domestic money supplies steadily increased because they were attracting large inflows of foreign investment.

The many additional factors that can complicate analysis should not obscure the important point: market forces of profit and loss determine and limit money supply expansion in the currency board country. As long as it is more profitable to invest funds in the currency board country than elsewhere (after taking into account inflation, exchange-rate risk, and transactions fees), banks in the currency board country will expand their loans. They will be able to do so because foreign investment is flowing in, bringing additional reserves to the banking system. When banks have expanded their loans to such an extent that additional loans would be less profitable than investing the funds abroad, they will not make such loans, and so the money supply will cease expanding. If it becomes more profitable to invest funds abroad than in the currency board country, the currency board country will lose reserves, banks will have to contract their loans to preserve their solvency, and so the money supply will contract. The currency board's role in all this is entirely passive: all it does is to convert notes and coins into and out of the reserve currency as the public and banks demand.



7 These include the risk that a balance of payments surplus or deficit will tempt the currency board country to set the exchange rate with the reserve currency at a different level. For example, after returning to the currency board system in 1983, Hong Kong's balance-of-payments surpluses with the U.S. prompted speculation that the Hong Kong government would revalue the Hong Kong dollar against the reserve currency, the U.S. dollar. When it became clear the Hong Kong government would not revalue, speculative pressure ceased and Hong Kong interest rates, which had fallen to low levels relative to U.S. rates, moved closer to U.S. dollar rates.

CHAPTER 4

CENTRAL BANKING

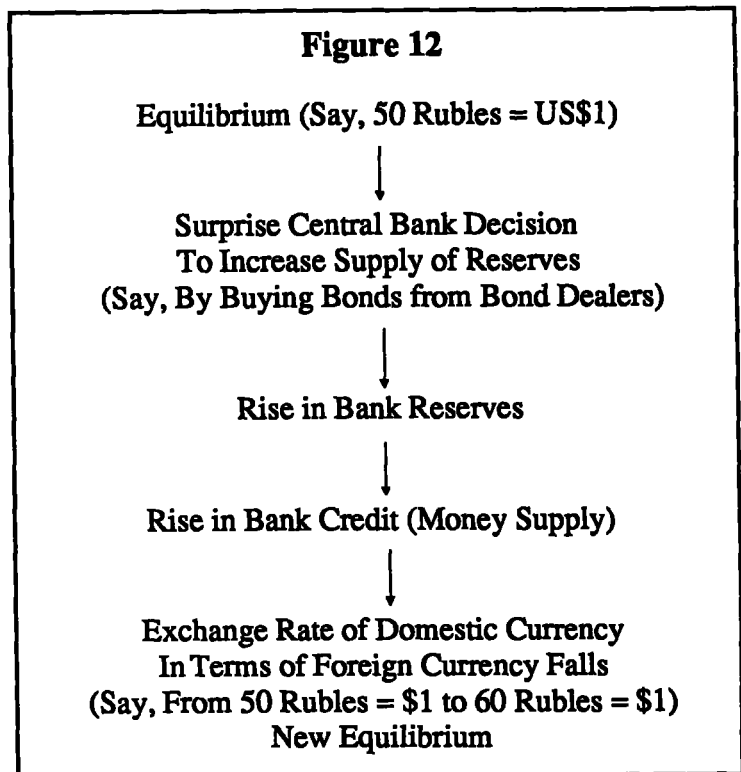
The essential difference between a currency board and a central bank is that a central bank does *not* work automatically. A central bank has discretionary power to influence the supply of money, and it not necessarily guided by considerations of monetary profit and loss. A currency board system is by nature a fixed exchange rate monetary system, while central banking is not. As we shall explain in the next chapter, the nature of central banking tends to drive central banking systems off of fixed exchange rates to floating exchange rates. Consequently, in this chapter, we compare a currency board to a floating-rate central bank, not to a central bank that maintains a fixed rate.

Central banks typically perform many other functions besides influencing the supply of money. They regulate commercial banks, serve as lenders of last resort to the banking system, give economic advice to the government, and clear checks. However, all these are secondary to their role in influencing the money supply. Only central banks control the supply of reserves in the banking system, whereas other government bodies can and do often perform the remaining central banking functions. For instance, in the United States, the Federal Reserve System shares regulatory powers with the Treasury Department, lender-of-last-resort powers with government deposit insurance agencies, economic advising powers with several other government bodies, and check clearing with commercial banks. We shall focus only on how central banks influence the money supply, so that we can contrast it with currency boards' role in the money supply process.

In a currency board system, the starting point in the chain of events in our example of a money supply *expansion* was a fall in the demand for imported goods in the currency board country. Changes in demand for imported goods originate in the market, as a result of changes in people's wants. In a central banking system, the starting point is a decision by the central bank to expand the supply of bank reserves. That is a *not* a decision that originates in the market. Indeed, the central bank can decide to act oppositely to what would happen under a currency board system.

Diagrammatically, the chain of events in the case of a surprise⁸ money supply expansion under central banking looks like Figure 12.

To bring out more clearly the contrast with a currency board system, the diagram omits consideration of the effects of various lags. It assumes that nominal prices adjust very quickly, leaving real prices unchanged. The only effect



8 We consider only the case of surprise to avoid complications concerning expectations.

of the central bank's decision is a fall in the exchange rate. Under the more realistic assumption that some nominal prices do not change quickly, the central bank's action has real effects on the economy. Indeed, that is the purpose of discretionary central bank policy under floating exchange rates. In the sequence above, the likely effect of the central bank's action would be to lower the prices of domestic goods compared to foreign goods, causing a temporary export boom.

The public's T account looks the same in a central banking system as it does in a currency board system. However, the T account of the currency board (see Figure 13) looks different than the central bank's T account (Figure 14).

Figure 13
CURRENCY BOARD

| Assets | Liabilities |
|-----------------------------|------------------------------|
| Foreign-currency securities | Notes and coins Net worth |

Figure 14
CENTRAL BANK

| Assets | Liabilities |
|--|--|
| Foreign-currency securities Domestic securities | Notes and coins Deposits of commercial banks Net worth |

In addition to holding foreign-currency-denominated securities as assets, as a currency board does, a central bank can also hold domestic-currency-denominated securities. In fact, many central banks, including those of the United States, Japan, and Germany, hold far more domestic securities than foreign securities. It is hypothetically possible for a central bank that does not intervene in foreign exchange markets to hold no foreign securities at all. Besides notes and coins and net worth, a central bank's liabilities also include deposits that commercial banks hold with it. Unlike currency boards, central banks accept deposits. Those deposits count as *reserves* for the commercial banks.

Commercial banks' T accounts in a currency board system are this:

Figure 15
COMMERCIAL BANKS—CURRENCY BOARD SYSTEM

| Assets | Liabilities |
|--|---|
| Currency board notes & coins (reserves) Loans and investments | Public's deposits Stockholders' equity |

