chapter 2

Money and Central Banks

1. The U.S. government owns about 4,500 tons of gold, stored mainly at Fort Knox in Kentucky. Why did the government accumulate this gold? Should it continue to hold the gold, or sell it?

ANSWER: The accumulation of gold by the U.S. government is related to the history of the U.S. dollar. The experiment of issuing fiat money, the Continental dollar, failed early in U.S. history. For almost 200 years, ending in the early 1970s, the U.S. government chose to issue money that was tied to gold in some fashion. With such a gold standard, a country is required to exchange paper money for units of gold held by the government. When the gold standard was given up in the United States, the government still owned the gold that was stored in Fort Knox. Since gold does not play a role in the issuance of money any more, the government can decide whether to hold or sell the gold based on the impact of this sale on the overall government budget and world gold markets. The difficulty of selling a large amount of gold is that the U.S. government could influence world gold prices. If the U.S. government wanted to sell gold, it would have to think about how to do this without making the gold market vulnerable to speculation. Selling large amounts of gold may also cause a crisis of confidence in money and the economy in general because many people are not clear on the fact that the government gold does not back money.

2. In the 1964 movie *Goldfinger*, the title character schemes to increase the price of gold. He plans to drop an atomic bomb on Fort Knox, making the gold there radioactive. His operation is financed by North Korea, which hopes to make the dollar worthless, disrupting the U.S. economy. If James Bond hadn't thwarted Goldfinger's plan, what effects might it have had on the monetary system and economy in 1964?

ANSWER: Recall that in 1964 private citizens were not allowed to hold gold, except to make jewelry. Only foreign governments were allowed to exchange dollars for gold. Radioactive gold would only cause a problem if gold had to be physically shipped to a foreign country. This would happen if foreign governments had dollar holdings that they wanted to convert to gold. Clearly, safe shipping of radioactive gold would be very expensive, if not impossible, causing a problem for the monetary system, in the sense that foreign countries might not want to accept dollars as payments any longer.

3. Scientists believe that the Sun will explode some billions of years from now. According to some economic theorists, this means that nobody should accept money today. What is the logic behind this idea?

ANSWER: The United States today uses fiat money, pieces of paper that are not backed by any commodity. Fiat money is only valuable when the holders of money today believe that this money will be accepted as a medium of exchange tomorrow. But tomorrow, the holders of money will find money useful only if they know that it will be accepted the next day. Continuing this logic requires that people today need to believe that fiat money will be accepted in infinity in order for it to be valuable today. By this logic, if people were worried about the Sun exploding some billion years from now, they should stop accepting fiat money today. Since this does not happen, we get some insight into people's idea of infinity—maybe just a million years look like infinity to us.

4. The U.S. population is approximately 300 million. Using the information in Table 2.1, calculate the average amount of U.S. currency per citizen. Do most Americans hold that much cash? If not, where is it?

ANSWER: The total amount of currency in May 2010 was $882,000 million. For a U.S. population of 300 million people this amounts to an average currency holding of $2,940 per person. Clearly most people do not carry that much cash on a regular basis. A lot of currency is held outside of the United States in countries where the U.S. dollar is judged to be a better store of value than the local currency. Large currency holdings by a small number of people within the United States can be attributed to illegal activities.

5. Suppose that technology completely eliminates the use of cash. People buy newspapers by putting debit cards in the newspaper box. They use the Internet to pay babysitters. With no cash, does the nature of money change? Should the Federal Reserve change the definition of M1?

ANSWER: M1 is one measure of a monetary aggregate, summing mostly the amount of currency and checking deposits (traveler's checks are already negligible and will go the way of dinosaurs in the near future). If the use of cash were completely eliminated, M1 would still be meaningful because the use of debit cards and the Internet ultimately affects people's checking account deposits when payments are made. Your use of the debit card to buy a newspaper triggers an immediate deduction from your checking account balance, so does the use of the Internet to pay a babysitter. In order to have a readily available medium of exchange in a cashless society, checking account deposits would still have to be held. The Federal Reserve does not need to change the definition of M1. Currency would simply enter as zero.

6. Explain how each of these events affects the amount of M1 that people hold.

a. ATMs are invented.

ANSWER: The ATM (automatic teller machine) now gives you 24-hour access to your checking account, whereas before you had to go to a live person in a bank branch during regular business hours to make a withdrawal. This will probably change the amount of cash you carry in your wallet. There is no need for large cash balances

in your wallet if you can always get to an ATM to replenish your cash, as long as you have checking deposits. But since both cash and checking deposits are part of M1, the total amount of M1 should not be affected when ATMs give you access to your checking account. If the ATM also gives you access to your savings account, you may start to keep more deposits in the savings account (to earn a bit more interest) because you could make regular ATM withdrawals from your savings deposits if necessary. This decision will reduce the amount of M1 because lower balances are held in checking deposits and higher balances are held in savings deposits. (Note that M2 will not be affected by this decision.)

b. Credit cards are invented.

ANSWER: Using a credit card to make a purchase means that you borrow until you pay off the credit card bill. You will have to transfer checking deposits to your credit card company to pay your credit card bill. Instead of accessing your checking deposit each time you make a purchase, you know that you need your checking deposit at only one time each month, when you pay your credit card bill. If you keep most of your money in a savings account until you have to pay your credit card bill, only transferring the necessary funds into checking deposits when necessary, your average monthly balance in checking deposits will be lower compared to a situation in which you do not have a credit card. This decision will reduce the amount of M1.

c. Debit cards are invented.

ANSWER: The use of debit cards for payment means that your checking deposit is reduced each time you make a purchase. Contrary to using a credit card, you are not able to put off reducing your checking account deposits until you pay one, larger bill. Thus, the introduction of debit cards should not change M1.

d. Stored-value cards are invented.

ANSWER: A stored-value card can be thought of as a prepaid debit card. In that sense, the stored-value card becomes an alternative to holding checking deposits. Like checking deposits, the stored-value card gives you access to very liquid assets that are available as a medium of exchange. Since stored-value cards are not counted as part of M1, the invention of these cards will reduce M1 as people shift checking account deposits to the stored-value cards.

e. Interest rates on bonds rise.

ANSWER: If interest rates on bonds rise, it becomes more costly to hold cash and checking deposits, both of which are assets that are generally non-interest-bearing. With a higher interest rate, people have an incentive to manage their liquid, non-interest-bearing assets more closely so that more assets can be held as bonds. Thus, a higher interest rate should reduce average cash and checking deposit balances and reduce M1.

7. Is your checking account a sweep account? Find out from your bank. How much of the money you deposit is actually in the account on a typical day, and how much has been swept into an MMDA?

ANSWER: Answers may vary depending on the bank where accounts are held. Note that MMDA stands for money-market deposit account. MMDA's are part of M2, but not of M1.

8. Recall the transactions that are triggered when you pay your rent (see Figure 2.2). Now suppose your check bounces because you don't have enough funds in your account. How does this change the series of transactions?

ANSWER: When you pay your rent by check, then your landlord Julia does not receive the payment until your check has been submitted to your bank and your bank has verified that you have sufficient balances in your checking account to cover the check. Your check will bounce if your balance is insufficient to cover the rent. Recall from Figure 2.2 that the Federal Reserve will debit your bank's account before the Fed sends the check to your bank and your bank debits your account. These transactions will have to be reversed when it turns out that your account has insufficient funds. The Fed will also reverse the transaction of crediting Julia's account.

9. For a citizen of the United States, how liquid is each of the following assets? Explain each answer.

a. Bonds issued by the U.S. government.

ANSWER: You can find daily information on government bonds in the financial pages of all newspapers. On a daily basis, U.S. government bonds are traded in large volumes. This makes these bonds very liquid. It is easy to convert those types of bonds into U.S. dollar cash or checkable deposits, the most liquid assets available.

b. Bonds issued by corporations.

ANSWER: Bonds issued by corporations can also be traded in a daily market, but the quality of those types of bonds varies depending on which corporation has issued them, and the volume traded is not as large (for bonds issued by a single corporation) as for government bonds. This makes bonds issued by corporations less liquid than U.S. government bonds.

c. Postimpressionist paintings.

ANSWER: There is a market for Postimpressionist paintings, but this market is harder to access and understand than the well-organized bond markets. Fewer buyers are available and it may take some time to sell such a painting. This means it is harder to convert the painting into cash than any kind of bond. Paintings are a less liquid form of holding an asset than bonds.

d. British pounds.

ANSWER: Like the U.S. dollar, the British pound is a major currency, easily exchanged for other major currencies. Given the current political situation and with access to a major financial institution, the British pound can be as easily converted into U.S. dollar cash or checkable deposits as a U.S. government bond.

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10. Using the data on the text Web site, compute the ratio of M1 to GDP and the ratio of M2 to GDP. These ratios show how much money people hold relative to total spending in the economy. Plot these ratios over the last 40 years. Have the ratios been steady, or have they risen or fallen? What might explain these trends?

ANSWER: The ratio of M1/GDP has been falling relatively steadily over the last 40 years, while the ratio of M2/GDP has been mostly constant over the same time period. For example, the ratio M2/GDP was at 0.57 in 1960 and at 0.58 in 2010. The declining ratio of M1/GDP is linked to a number of financial innovations that have made it easier for people to transfer funds between checking accounts and other types of savings accounts, for example, ATM machines and online banking.

11. Figure 2.4 shows that sweep programs have reduced the level of M1. How do you think sweeps have affected M2? Do the M2 data on the text Web site support your answer?

ANSWER: Sweep programs transfer funds from checking accounts to money-market deposit accounts (MMDA). Since checking account balances and MMDAs are both part of M2, sweep programs leave M2 unchanged. The data on the text Web site show that M2 increased substantially during the time period since 1994 when sweep programs first started. This growth cannot be attributed to the sweep program though.

12. Link through the text Web site to the 2010 Federal Reserve Payments Study. From 2006 to 2009, did the shift to electronic payment shown in Figure 2.1 slow down, continue at the same pace, or speed up? Explain why.

ANSWER: Results from this study should be available at the end of 2010.

13. The text Web site has links to several sites with information about stored-value cards. Some are maintained by card issuers, others by government agencies or consumer advocates. After visiting some of these sites, discuss the pros and cons of multipurpose stored-value cards. Who, if anybody, would be wise to use them?

ANSWER: Stored-value cards are cards with a magnetic strip on the back or equipped with a microchip; they hold information about money that has been prepaid into an account for the purpose of making payments. These cards are neither credit nor debit cards. An advantage of using such stored-value cards is that they tend to be safer than cash or checks. A lost or stolen card can be replaced. This is one reason why the government now uses stored-value cards for social security recipients and other recipients of transfer payments. Another advantage is that these cards can be used to make Internet purchases, facilitating purchases and bill paying, but because they are prepaid, spending is limited to the amount loaded on the card. This makes these cards useful for people who need help with budgeting (e.g., teens) and people who do not have a bank account. Disadvantages of using a stored-value card are the potential costs involved of using the card. It may be less costly to maintain a

regular checking account rather than using a stored-value card. Such cards often have multiple fees, such as reload fees or transaction limit fees. Also, compared with traditional checking account balances, it is unclear whether balances on a stored value card are insured in case of default of the issuer. Furthermore, it is not clear how use of a stored-value card contributes to a consumer's ability to establish credit. The major drawbacks of using stored-value cards are uncertainty about consumer protection and consumer ability to establish credit.