

## Chapter 2

# Money and the Payments System

### Chapter Overview

As indicated by the title, this chapter covers money and the payments system, which includes checks and electronic payments. The implications of new technologies for money are discussed as well as the measurement of the money supply.

Reading this chapter will prepare students to:

- Define money and explain its three basic uses, which are:
  - Means of payment;
  - Unit of account; and
  - Store of value.
- Explain how money makes the payments system work, and define the three broad categories of payments, which are:
  - Cash;
  - Checks; and
  - Electronic payments.
- Evaluate the future use of money and the likelihood of its being used less and less as a means of payment
- Comprehend the links among money, inflation, and economic growth, and the requisite need to measure the money supply.
- Describe two basic measures of money, which are:
  - M1, the narrow definition of money, and
  - M2, a broader measure which includes assets not used as a means of payment.

### Important Points of the Chapter

To understand the impact of money on the economy—why it’s so important to the smooth functioning of the economy and how it improves everyone’s well being—we need to understand exactly what money is, and to quantify its impact on the economy we need to be able to measure it. The goals of this chapter are to understand what money is, how we use it, and how we measure it.

### Application of Core Principles

*Principle #3: Information.* Money as a means of payment solves an information problem; money finalizes payments so that buyers and sellers have no further claim on each other. So long as a buyer has money, there is nothing more the seller needs to know.

*Principle #1: Time.* Money as a store of value saves time; holding money means not having to convert other assets into spendable form every time we wish to make a purchase.

*Principle #1: Time.* The introduction of new money market accounts in the 1980s made M2 accounts more liquid. M1 and M2 no longer moved together and analysts stopped looking at M1 and began to look at M2.

### **Teaching Tips/Student Stumbling Blocks**

- Most of the material in this chapter is fairly straightforward, but students will be puzzled by the idea that credit cards are not money. The key, as pointed out in the text, is that a credit card represents access to someone else's money. Another way to explain this is to note that when one uses a credit card the transaction is not over; a bill will come and will need to be paid.
- Here's an idea for an interesting class discussion: are impulse purchases more likely when a credit card is available than when someone only has cash? If you assigned a spending journal in conjunction with the coverage of Chapter 1, use it to illustrate differences in spending patterns.

### **Features in this Chapter**

#### *Your Financial World: Debit Cards vs. Credit Cards*

Which card should a consumer use? A debit card takes the funds from your account immediately, while a credit card creates a deferred payment. However, if you don't pay your credit card debt on time there is a late fee, and if you don't pay it all you incur interest charges on the balance. If you can pay off your credit cards in full and on time, it's to your advantage to use them. Credit cards also help you build a credit history, which you will need when you want to borrow money to buy a car or house.

#### *Your Financial World: Paper Checks Become Digital Images*

On October 28, 2004, "Check 21—the Check Clearing for the 21<sup>st</sup> Century Act" went into effect. This meant that banks would no longer have the expensive headache of transporting paper checks back and forth. Instead, banks can transmit digital images of every check written. These "substitute checks" have the same legal standing as proof of payment as the original checks, and the change is estimated to save banks \$2 billion a year. It also means eliminating the risks involved in physically transporting checks. The bad news for consumers is that they can no longer write a check figuring they'll have a few days to deposit funds to cover it; speeding up paper check processing does have a downside.

*Lessons from the Crisis: Market Liquidity, Funding Liquidity, and Making Markets*

A “market maker” in stocks, bonds, or other securities is usually a financial institution that buys and sells securities on behalf of clients. If demand is greater than supply, the market maker must be able to act as a seller to clear the market. Market liquidity and funding liquidity are both needed to make financial markets work. A sudden loss of liquidity was central to the financial crisis of 2007-2009. Both funding and market liquidity dried up. Market liquidity dried up because investors began to doubt the value of a wide class of securities. Funding liquidity followed as their lenders worried about their potential losses.

*In the News: Dad Can You Text Me \$200?*

A new service by CashEdge, Inc. would let users send money via text message or email. The new service, called POPmoney, will allow consumers to pay other people (POP), for a fee, through their bank’s online or mobile banking application by providing the recipient’s email address, cell phone number, or account number.

Lessons of the Article: Technological advances are constantly creating new methods of payment. While their adoption depends on many things, one thing is for certain: someone will always be searching for easier and cheaper ways for us to pay for things. And as the payments system evolves, so will the assets that we need to hold. As our cell phones transform into a part of the payments system, we will need to carry less and less cash.

*Applying the Concept: Where are all those \$100 Bills?*

If we take all the currency in circulation in the United States and divide it by the population, each person should be holding about \$2800 in cash! And moreover, there must be eighteen \$100 bills for each U.S. resident. Since this is not really true, where are all those \$100 bills? The answer is that they are outside the country, in countries where people don’t trust the value of their own currencies. Everyone seems to have faith in the U.S. dollar! The U.S. Treasury estimates that between two-thirds and three-quarters of U.S. currency is held outside the United States; that’s more than \$600 billion, and most of it is in hundreds!

*Tools of the Trade: The Consumer Price Index*

The CPI is designed to answer the question “How much more would it cost for people to purchase today the same basket of goods and services that they actually bought at some fixed time in the past?” To answer this question, every few years statisticians at the Bureau of Labor Statistics (BLS) conduct surveys to find out what people bought. Then the BLS collects information on the prices of thousands of goods and services. Combining the two allows the BLS to compute the current cost of the basket. This current cost is then compared to a benchmark to yield an index. The percentage change

in this index is a measure of inflation. Experts suggest that the CPI overstates inflation because it does not take into account the fact that people make substitutions in the goods and services they buy when prices change. To address this problem (called “substitution bias”) the BLS now changes the weights used in the calculations every two years.

### **Additional Teaching Tools**

In a January 5, 2010, article on [BusinessWeek.com](http://www.businessweek.com), Allison Abell Schwartz reports that U.S. retail sales rose during the week after Christmas, 2009, as shoppers redeemed gift cards. Sales of gift cards were higher than anticipated.

With banks cutting back on credit lines or shutting them down altogether, the use of barter is increasing, according to a Business Week article published April 26, 2010. Businesses see bartering as a way to cut cash outflow. Many of these businesses use barter exchanges, or fee based membership groups. These groups often issue “barter dollars” when a member performs a service or offers a product. These barter dollars can be used to purchase goods or services from another member within the exchange. The barter exchanges serve as an avenue for some businesses to stay afloat.

([http://www.businessweek.com/magazine/content/08\\_64/s0804021853506.htm](http://www.businessweek.com/magazine/content/08_64/s0804021853506.htm))

To learn more about “Check 21” visit the “frequently asked questions” page on the web site of the Federal Reserve System at

[http://www.federalreserve.gov/pubs/check21/consumer\\_guide.htm](http://www.federalreserve.gov/pubs/check21/consumer_guide.htm).

Gary Rivlen has recently written a book entitled [Broke, USA: From Pawnshops to Poverty, Inc.](#) which shows how lending against future paychecks became such big business.

([http://businessweek.com/print/magazine/content/10\\_22/b4180056325806.htm](http://businessweek.com/print/magazine/content/10_22/b4180056325806.htm))

### **Virtual Tools**

Go on a virtual field trip and tour the Historical American Currency Exhibit at the Federal Reserve Bank of San Francisco by visiting its web site at:

<http://www.frbsf.org/currency/>

Some of the currencies mentioned in this chapter (like the Continental) are on display.

Students can also visit the United States Mint at:

<http://www.usmint.gov/index.cfm?flash=yes>

Here’s a site with lots of info about e-money and good links to other resources on the topic:

<http://www.ex.ac.uk/~RDavies/arian/emoney.html>

For more information about “Check 21” with a particular emphasis on what it means for consumers, visit this page by Consumers Union on Check 21.

<http://www.consumersunion.org/finance/ckclear1002.htm>

The U.S. Secret Service Counterfeiting Division has interesting information on its site including more about how to spot fake bills; visit them at:

[http://www.secretservice.gov/know\\_your\\_money.shtml](http://www.secretservice.gov/know_your_money.shtml).

## **For More Discussion**

Will there ever be a cashless society? What are the pros and cons of replacing cash with some of the electronic payments mechanisms mentioned in this chapter? Students are likely to point out that less cash may mean less robbery, both by “outsiders” and “insiders” and they may also have a sense that having to count and deposit cash can be more time-consuming and so less efficient than having transactions that are immediately recorded. But on the negative side, students may also raise issues of privacy, and note that high-tech crime may just replace “old-fashioned” stick-ups.

## **Chapter Outline**

### **I. Money and How We Use It**

As used in conversation, the word “money” can mean many things. However, we will use the word in a narrower, more specialized sense to mean anything that can readily be used to make economic transactions. Formally defined, money is an asset that is generally accepted as payment for goods and services or repayment of debt. Money has three characteristics: it is a means of payment, a unit of account, and a store of value.

#### **A. Means of Payment**

1. The primary use of money is as a means of payment.
2. Barter is an alternative to using money and doesn’t work very well.
3. Barter requires a “double coincidence of wants,” meaning that in order for trade to take place both parties must want what the other has.
4. Money finalizes payments so that buyers and sellers have no further claim on each other.
5. As economies have become more complex and physically dispersed the need for money has grown.

**B. Unit of Account**

1. We measure value using dollars and cents.
2. Money is the unit of account that we use to quote prices and record debts.
3. Money can be referred to as a standard of value.
4. Using money makes comparisons of value easy.

**C. Store of Value**

1. For money to function as a means of payment it has to be a store of value too because it must retain its worth from day to day.
2. The means of payment has to be durable and capable of transferring purchasing power from one day to the next.
3. Money is not the only store of value; wealth can be held in a number of other forms.
4. Other stores of value can be preferable to money because they pay interest or deliver other services.
5. However, we hold money because it is liquid, meaning that we can use it to make purchases.
6. Liquidity is a measure of the ease with which an asset can be turned into a means of payment (namely money).
  - a. The more costly an asset is to turn into money, the less liquid it is.
  - b. Constantly transforming assets into money every time we wish to make a purchase would be extremely costly; hence we hold money.
  - c. Financial institutions often use market liquidity to refer to their ability to sell assets for money. Funding liquidity refers to their ability to buy security or to make loans. Financial institutions need both to operate day-to-day.

**II. The Payments System**

The payments system is the web of arrangements that allow for the exchange of goods and services, as well as assets, among different people. The efficient operation of our economy depends on the payment system and so it is a critical policy concern that it function well. Money is at the heart of the payments system.

**A. Commodity and Fiat Monies**

1. The first means of payment were things with intrinsic value like silk or salt.
2. Successful commodity monies had the following characteristics:
  - a. They were usable in some form by most people;
  - b. They could be made into standardized quantities;
  - c. They were durable;
  - d. They had high value relative to their weight and size so that they were easily transportable; and
  - e. They were divisible into small units so that they were easy to trade.
3. For most of human history, gold has been the most common commodity money.
4. In 1656, a Swede named Johan Palmstruck founded the Stockholm Banco and five years later issued Europe's first paper money.
5. The money was welcomed at first because it was easy to handle, but the King persuaded Palmstruck to print more of them (to finance some wars the King was fighting) and the currency lost value. Ultimately Palmstruck's bank failed.
6. Other people tried issuing money in the early 1700s and eventually governments got into the act.
7. In 1775, the newly formed Continental Congress of the United States of America issued "continentals" to finance the revolutionary war, and twenty years later revolutionary France issued the "assignat." Both currencies were issued in huge quantities and both eventually became worthless.
8. As a result, people became suspicious of government-issued paper money.
9. Following the end of the Civil War the U.S. government changed from the paper money it had issued during the War back to using gold.
10. In the United States, gold coins and notes backed by gold circulated well into the 20<sup>th</sup> century.
11. Today we use paper money that is fiat money, meaning that its value comes from government decree (or fiat).
12. A note (whether it's a \$1 or a \$100 bill) costs about 6 cents to produce.
13. These notes are accepted as payment for goods or in settlement of debts for two reasons
  - a. We take them because we believe we can use them in the future.

- b. The law says we must accept them; that is what the words “legal tender” printed on the bill means.
14. As long as the government stands behind its paper money, and doesn’t issue too much of it, we will use it. In the end, money is about trust.

#### B. Checks

1. Checks are another way of paying for things, but they aren’t legal tender and they aren’t even money.
2. A check is an instruction to the bank to take funds from your account and transfer them to the person or firm you designate (by writing the name on the check).
3. When you give someone a check in exchange for a good or service, it is not a final payment; a series of transactions must still take place that lead to the final payment.
4. Here are the steps in the process:
  - a. You hand the check over to the merchant who then takes it to the bank.
  - b. The bank credits the merchant’s account with the amount of the check (either immediately or with a short lag).
  - c. At the end of the day, the bank sends the check (or an electronic image of it) through the check-clearing system to be processed (either at the check-processing center run by the Federal Reserve or to a private check clearinghouse).
  - d. The center sends the check to the bank on which it was written (your bank).
  - e. The account of the bank receiving the check is credited and the account of the bank on which the check was written is debited.
  - f. On receipt of the check your bank debits your account and most likely makes scanned images of the cleared checks available to you, either in your paper end-of-month statement or online. Years ago all checks were returned to their writers.
5. Though check volumes have fallen, paper checks are still with us because a cancelled check is legal proof of payment and, in many states laws require banks to return checks to customers. Also, new electronic mechanisms have made processing cheaper and easier.
6. Force of habit means that many people, when given a choice, still opt to receive their cancelled checks with their statements.



### C. Electronic Payments

1. The third and final method of payment is electronic.
2. There are credit cards, debit cards, and electronic funds transfer.
3. A debit card works like a check and there is usually a fee for the transaction.
4. A credit card is a promise by a bank to lend the cardholder money with which to make purchases. When the card is used to buy merchandise the seller receives payment immediately.
5. However, the money that is used for payment does not belong to the buyer; rather, the bank makes the payment, creating a loan that the buyer must repay.
6. For this reason, credit cards do not represent money; rather, they represent access to someone else's money.
7. Electronic funds transfers move funds directly from one account to another. While such payments are less well known than credit card or debit card payments, these transfers account for the bulk of the \$30 trillion worth of non-cash retail payments made electronically each year in the United States.
8. Banks use these transfers to handle transactions among themselves.
9. Individuals may be familiar with such transfers through direct deposit of their paychecks, etc.
10. Retail businesses are experimenting with new forms of electronic payment, including the stored-value card (examples are long-distance telephone cards).
11. E-money is another new method of payment that can be used for purchases on the Internet. It is really a form of private money.

### III. The Future of Money

- A. The time is rapidly approaching when safe and secure systems for payment will use virtually no money at all.
- B. We will also likely see fewer "varieties" of currency, a sort of standardization of money and a dramatic reduction in the number of units of account.
- C. Finally, money as a store of value is clearly on the way out as many financial instruments have become highly liquid.

#### **IV. Measuring Money**

- A. Changes in the amount of money in the economy are related to changes in interest rates, economic growth, and most important, inflation.
- B. Inflation is a sustained rise in the general price level.
- C. With inflation you need more money to buy the same basket of goods because it costs more.
- D. Inflation makes money less valuable.
- E. The primary cause of inflation is the issuance of too much money.
- F. Because money growth is related to inflation we need to be able to measure how much money is circulating.
- G. We compute measures of money called the monetary aggregates: M1 and M2.
  - 1. M1 is the narrowest definition of money and includes only currency and various deposit accounts on which people can write checks. Specifically, it is currency in the hands of the public, traveler's checks, demand deposits and other checkable deposits.
  - 2. M2 includes everything that is in M1 plus assets that cannot be used directly as a means of payment and are difficult to turn into currency quickly, like small-denomination time deposits, money market deposit accounts, and money market mutual fund shares. M2 is the most commonly quoted monetary aggregate.
- H. Up until the 1980s M1 was the most closely watched monetary aggregate, but is no longer a useful measure of money.
- I. As new substitutes for checking accounts became more prevalent M1 became less useful than M2.
- J. M2 no longer predicts inflation. It may be that still another new measure of money is needed.

#### **Terms Introduced in Chapter 2**

automated clearinghouse transaction (ACH)  
checks  
credit card  
currency  
debit card  
demand deposits  
electronic funds transfer

e-money  
fiat money  
funding liquidity  
gross domestic product (GDP)  
inflation  
inflation rate  
liquidity  
M1  
M2  
market liquidity  
means of payment  
money  
monetary aggregates  
payments system  
store of value  
stored-value card  
time deposits  
unit of account  
wealth

## Lessons of Chapter 2

1. Money is an asset that is generally accepted in payment for goods and services or repayment of debts.
  - a. Money has three basic uses:
    - i. Means of payment
    - ii. Unit of account
    - iii. Store of value
  - b. Money is liquid. Liquidity is the ease with which an asset can be turned into a means of payment.
  - c. For financial institutions, market liquidity is the ease with which they can sell a security or loan for money. Funding liquidity is the ease with which they can borrow to acquire a security or loan.
2. Money makes the payments system work. The payments system is the web of arrangements that allows people to exchange goods and services. There are three broad categories of payments, all of which use money at some stage:
  - a. Cash
  - b. Checks
  - c. Electronic payments
3. In the future money will be used less and less as a means of payment.

4. To understand the links between money, inflation, and economic growth, we need to measure the quantity of money in the economy. There are three basic measures of money;
  - a. M1, the narrowest measures, includes only the most liquid assets.
  - b. M2, a broader measure, includes assets not usable as means of payment.
  - c. M3, the broadest commonly used measure of money, includes much less liquid assets than M2.
  - d. Countries with high money growth have high inflation.
  - e. In countries with low inflation, money growth is a poor forecaster of inflation.

### Conceptual Problems

1. The country of Brievonia has an economy that is based largely on farming and agricultural products. The inhabitants of Brievonia use cheese as their money.
  - a. Not surprisingly, the Brievonians complain bitterly about the problems that their commodity money creates. What are they?
  - b. Modern medical science arrives in Brievonia, and doctors begin giving the Brievonians cholesterol tests. The results lead to the recommendation that the Brievonians reduce the amount of cheese they eat. What is the impact of this recommendation on their economy?
  - c. As the economy of Brievonia becomes industrialized, what changes in the monetary system would you expect to see, and why?

Answer:

- a. Cheese is not very durable and therefore would be problematic to transport.
  - b. This would reduce the value of cheese and cause prices to increase.
  - c. As the Brievonian economy grows, the use of money will increase. Brievonians will be motivated to find a more convenient form of money. Eventually, the government would probably issue paper currency.
2. Describe at least three ways you could pay for your morning cup of coffee. What are the advantages and disadvantages of each?

Answer: You could use money, a check, or a debit card.

Money: This is the most likely to be accepted, but it means you have to replenish your supply periodically.

Check: The least likely to be accepted, and it means you have to walk around with your checkbook. But the funds remain in your bank account for the time it takes the check to make its way through the clearing system.

Debit Card: This is very convenient, and likely to be accepted. But it means immediate withdrawal of the funds from your account. (This is probably the cheapest option for the merchant).

3. Explain how money encourages specialization, and how specialization improves everyone's standard of living.

Answer: Without money, people have to barter to exchange goods and services. This requires a "double coincidence of wants," which makes it difficult to specialize. In the example in the text, a plumber is buying groceries; if the grocer doesn't need a plumbing repair, but does need the outside of his store painted, the plumber may decide to paint the store in order to pay for his groceries even though it is not what he does best. When money is used, people are free to specialize in areas in which they have a comparative advantage, increasing the production of society as a whole, and improving everyone's standard of living.

4. \*Could the dollar still function as the unit of account in a totally cashless society?

Answer: Yes. Using dollars and cents to quote prices and record debts does not depend on cash being used as a means of payment. Dollars and cents may still serve as the standard measurement of value even if they are not themselves exchanged.

5. Explain why a security for which there is a financial institution acting as a market maker would be more attractive to an investor.

Answer: The existence of a market-maker enhances the liquidity of the security, making it easier for an investor to adjust their holdings.

6. As of March 2010, 16 of the 27 countries of the European Union have adopted the euro. The remaining 11 countries, including Great Britain, Denmark, and Sweden have retained their own currencies. What are the advantages of a common currency for someone who is traveling through Europe?

Answer: Each country has the same unit of account, making it easier for a traveler to compare prices in different countries. The traveler also saves the costs of exchanging currencies.

7. Using the current level of M2 from the Federal Reserve's Web site, compute the quantity of money divided by the (approximate) population of the United States. Do you think that your answer is large? Why?

Answer: The December 2009 (seasonally adjusted) level of M2 was \$8524.3 billion. Dividing this by 300 million equals \$28,414. This seems like a lot, but M2 includes money market mutual fund shares, money market deposit accounts, small-denomination time deposits, checking accounts, and traveler's checks in addition to currency in the hands of the public. Large investments in CDs and money market mutual funds are what skew the average.

8. Using data from the Federal Reserve's Web site, compute the annual percentage change in M1 and M2 since 1980. Use the data to reproduce Figure 2.3. Comment on the pattern over the last five years. Would it matter which of the two monetary aggregates you looked at?

Data are available from <http://research.stlouisfed.org/fred2/> and can be downloaded into a spreadsheet. You can also get the data from [www.federalreserve.gov](http://www.federalreserve.gov), Release H.6. For most of the period since 2004 onwards, the growth rate in M2 tended to be higher than that of M1. This pattern changed, however, towards the end of 2008, after which M1 consistently grew more rapidly than the broader aggregate. Moreover, the growth in M1 has been significantly more volatile over the period. Given the differences in the behavior of the two aggregates, it would matter which one you looked at.

9. Despite the efforts of the United States Treasury and the Secret Service, someone discovers a cheap way to counterfeit \$100 bills. What will be the impact of this discovery on the economy?

Answer: People will be unwilling to accept \$100 bills as payment and will require payment via check, credit card, debit card, or electronic transfer instead. Theoretically, inflation could result if the supply of money was increased by a large enough amount.

10. \*You have decided to issue your own currency and use your computer to produce some impressive looking notes. What could you do to increase the chances of these notes being accepted as a means of payment?

Answer: As a private currency not backed by a government decree, the notes are highly unlikely to simply be accepted in exchange for goods and services equal to some value printed on the note. You could back the notes with a commodity that has intrinsic value such as gold or with US dollars. Then anyone receiving payment in the form of your notes would be able to exchange them with you for something they know has value or that will be widely accepted as a means of payment. Even this strategy may not work, however, due to information costs, as the backing of your notes must be perceived as credible.

11. Over a nine-year period in the 16<sup>th</sup> century, King Henry VIII reduced the silver content of the British pound to one-sixth its initial value. Why do you think he did so? What do you think happened to the use of pounds as a means of payment? If you held both the old and new pounds, which would you use first, and why?

Answer: King Henry needed to silver to pay for wars. The use of pounds as a means of payment declined because people could not be sure how much silver each coin

contained. People spent the new coins first since the old coins had a higher intrinsic value.

### Analytical Problems

12. Under what circumstances might you expect barter to reemerge in an economy that has fiat money as a means of payment? Can you think of an example of a country where this has happened recently?

Answer: You might expect an economy to revert to barter when the public loses confidence in the fiat money issued by the Government, perhaps because of over-use of the printing presses. For example, this has happened during episodes of extremely high inflation, such as that experienced in Zimbabwe since the early 2000's.

13. You visit a tropical island that has only four goods in its economy – oranges, pineapples, coconuts and bananas. There is no money in this economy.
- Draw a grid showing all the prices for this economy. (You should check your answer using the  $n(n - 1)/2$  formula where  $n$  is the number of goods.)
  - An islander suggests designating oranges as the means of payment and unit of account for the economy. How many prices would there be if her suggestion were followed?
  - Do you think the change suggested in part *b* is worth implementing? Why or why not?

Answer:

- a. There would be six prices in total.

	<i>Oranges</i>	<i>Pineapples</i>	<i>Coconuts</i>	<i>Bananas</i>
<i>Oranges</i>				
<i>Pineapples</i>	Pineapples/Oranges			
<i>Coconuts</i>	Coconuts/Oranges	Coconuts/Pineapples		
<i>Bananas</i>	Bananas/Oranges	Bananas/Pineapples	Bananas/Coconuts	

- There would be three prices – pineapples/oranges, coconuts/oranges and banana/oranges.
- In the case of this four-good economy, there is only a small gain by using oranges as a unit of account. The gains would be significantly bigger in an economy with more goods. If the islanders think the range of goods in their economy is likely to expand, then it is probably worth implementing the change. One of the drawbacks to consider would be the danger that more people would grow oranges, due to their special status, thus pushing up the prices of the other fruits in terms of oranges.

14. Consider again the tropical island described in question 13. Under what circumstances would you recommend the issue of a paper currency by the government of the island? What advantages might this strategy have over the use of oranges as money?

Answer: The Islanders must have enough confidence in their government to accept notes backed only by a government decree that have no intrinsic value themselves. They have to believe that these notes will be widely accepted by other islanders as final payment for goods and services and in settlement of debts. They must trust that the government will not print too much of the money and undermine its value. Some advantages of the paper money over commodity money in the form of oranges include being easier to carry, longer lasting and more divisible. Most importantly, it would be the government that would control the supply of money on the island as only the Government could print new notes, while any of the islanders might decide to grow more oranges.

15. What factors should you take into account when considering using the following assets as stores of value?
- Gold
  - Real estate
  - Stocks
  - Government bonds

**Answer:**

- The potential for the price of gold to rise, the ability to buy and sell gold easily and any costs associated with storage and security.
- The rate at which real estate is appreciating and is likely to appreciate in the future; how easy or difficult it is to sell real estate; the housing services you could receive from holding the real estate.
- The potential appreciation in nominal value of the stock; the historical volatility of the stock price; the volume of the stock being traded on the secondary market to gauge its liquidity.
- The rate of return on the bonds – including any potential capital gain as well as interest payments.

**When assessing an asset as a store of value, the primary things to consider are the risk and return of the asset and its liquidity.**

16. \*Under what circumstances might money in the form of currency be the best option as a store of value?

Answer: If there were deflation in the economy, then paper currency would increase in value. When deflation occurs, overall prices in the economy are falling and so the notes you hold have more purchasing power. During periods of falling prices of



goods and services, prices of assets often fall too and so currency might be an attractive option as a store of value.

17. Suppose a significant fall the price of certain stocks caused the market makers in those stocks to worry about their funding liquidity. Under what circumstances might that development lead to liquidity problems in markets for other assets?

Answer: Faced with difficulties in borrowing money, the market makers in the stocks may decide to hold more cash to ensure their ability to meet clients' demands. This, in turn, reduces loans available for other market participants potentially causing them to alter their behavior and could lead to funding liquidity problems throughout the financial system. Moreover, to fund itself, the market maker might try to sell other assets, depressing their prices and spreading the disruption.

18. \*Consider an economy that only produces and consumes two goods - food and apparel. Suppose the inflation rate based on the consumer price index is higher during the year than that based on the GDP deflator. Assuming underlying tastes and preferences in the economy stay the same, what can you say about food and apparel price movements during the year?

Answer: As the two price indices yield different inflation rates with preferences remaining constant, the relative price of the two goods must have changed. In other words, the price of one of the goods must have gone up by a greater percentage than the other. For example, suppose the price of food went up by 10% while the price of apparel went up by 20%. This would induce consumers to substitute away from apparel to food. As a fixed weight index, the CPI would not take this substitution into account while the GDP deflator would, as it is calculated on the basis of what is actually purchased. Therefore, the CPI inflation rate would be higher than the rate calculated from the GDP deflator.

19. Assuming no interest is paid on checking accounts, what would you expect to see happen to the relative growth rates of M1 and M2 if interest rates rose significantly?

Answer: When interest rates rise, you would expect that people would shift funds from checking accounts into savings accounts, as the opportunity cost of holding funds in a non-interest bearing account has risen. Checking accounts are a component of M1 while both checking and some savings accounts are included in M2. Therefore, any shift from checking to savings accounts would depress growth in M1 to a greater degree than growth in M2, leading to a relative increase in the M2 growth rate.

20. If money growth is related to inflation, what would you expect to happen to the inflation rates of countries that join a monetary union and adopt a common currency such as the euro?

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Answer: Once countries join a monetary union, they effectively share a common money supply. Given the link between money growth and inflation, you would expect the inflation rates of these countries to converge.

\* indicates more difficult problems