Chapter 2

Money and the Payments System

Learning Objectives

1. Define money and describe its functions.
2. Discuss the different methods of payment and the future of money.
3. Explain how the money supply is measured and how it is linked to economic growth and inflation.

Money and How We Use It

- Money is *an asset that is generally accepted as payment for goods and services or repayment of debt.*
- Income is a flow of earnings over time
- Wealth is the value of assets minus liabilities.
  - Money is one of those assets.

Money and How We Use It

Money has three characteristics:

1. It is a **means of payment**
2. It is a **unit of account**, and
3. It is a **store of value**.

The first of these characteristics is the most important

Money and How We Use It

Means of Payment

- People insist on payment in money.
  - Barter requires a "double coincidence of wants".
- Money is easier and finalizes payments so there is no further claim on buyers and sellers.
- The increase in the numbers of buyers and sellers requires something like "money" to make transactions smoother.

Money and How We Use It

Unit of Account

- Money is used to quote prices and record debts - it is a standard of value.
- Prices provide the information needed to ensure resources are allocated to their best uses.
- Using dollars makes relative price comparisons easier.

YOUR FINANCIAL WORLD

Debit Cards versus Credit Cards

- When you shop, should you use a debit card or a credit card?
- A debit card works like a check only faster.
  - Funds are immediately removed from your account.
- A credit card makes a deferred payment.
  - If not paid on time, there is a late fee.
  - If not paid fully, there is interest on the debt.
  - But if you do pay on time and fully, it is an interest free loan for a period of time.
  - Credit cards allow you to build a credit history.

Money and How We Use It

Store of Value

- A means of payment has to be durable and capable of transferring purchasing power from one day to the next.
- Paper currency does degrade, but is accepted at face value in transactions.
- Other forms of wealth are also a store of value: stocks, bonds, houses, etc.

Money and How We Use It

Store of Value (cont.)

- Although other stores of value are sometimes better than money, we hold money because it is liquid.
- Liquidity is *a measure of the ease with which an asset can be turned into a means of payment.*
  - The more costly it is to convert an asset into money, the less liquid it is.

Money and How We Use It

Store of Value (cont.)

- Financial institutions use:
  - Market liquidity - the ability to sell assets for money.
  - Funding liquidity - ability to borrow money to buy securities or make loans.

The Payments System

- The payments system is a web of arrangements that allow for the exchange of goods and services, as well as assets.
  - The efficient operation of the economy depends on the payments system.
- The possible methods of payment are:
  1. Commodity and Fiat Monies
  2. Checks
  3. Electronic Payments

Commodity and Fiat Monies

- Commodity monies are things with intrinsic value.
  - Included items like silk and salt.
- To be successful, a commodity money must be:
  - Usable by most people
  - Can be made into standardized quantities
  - Durable
  - Easily transportable
  - Divisible into smaller units

Commodity and Fiat Monies

- Gold has been the most common commodity money as it meets these requirements.
- In 1661, Stockholm Banco issued Europe's first paper money
  - King of Sweden printed too many to try to finance a war and the bank failed.
- In 1775, the Continental Congress of the United States of America issued “continentals” to finance the Revolutionary War.
  - Both governments issued too much and the currency became worthless.

Commodity and Fiat Monies

- Because of the failures, people became suspicious of government-issued paper money.
- In 1862, the Confederate and the Union governments printed money with no explicit backing.
- After the Civil War, the U.S. reverted to using gold as money.

Commodity and Fiat Monies

- Gold coins and notes, backed by gold, were used into the 20th century.
- Today's paper money is called fiat money, because its value comes from government decree, or *fiat*.
- We are willing to accept these bills as payment because the U.S. government stands behind its paper money.
- In the end, money is about trust.

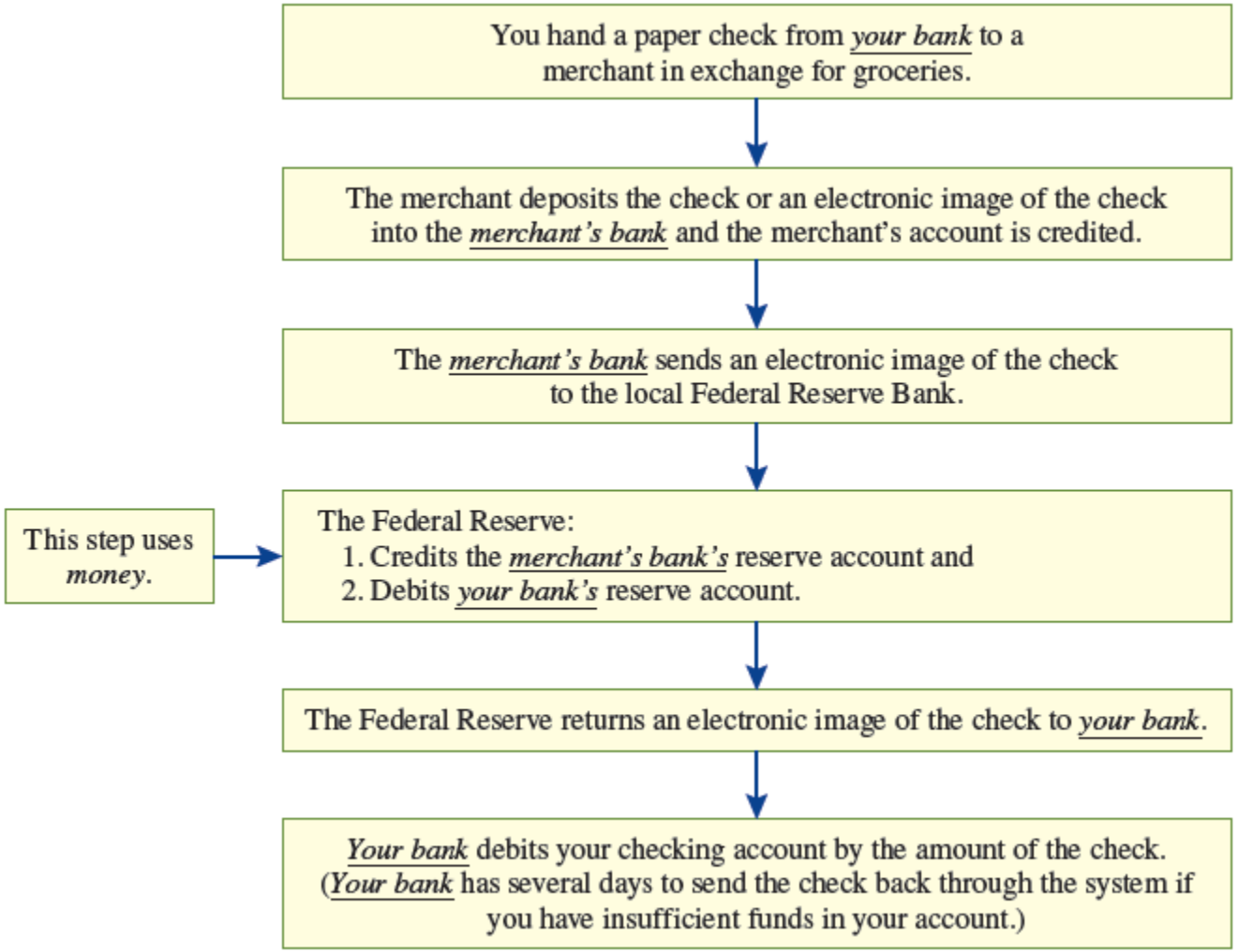
Commodity and Fiat Monies

- Today, some critics claim the U.S. should return to the gold standard.
  - There is fear of governments issuing too much paper money.
- A gold standard may not be time consistent.
  - In a crisis, a government can renege on the use of a gold standard to stabilize the economy.
  - Movement away from the gold standard was prompted by the Great Depression.
- A fiat currency must be limited in volume of circulation to be credible.

Checks

- A check is an instruction to the bank to take funds from your account and transfer them to another account.
  - A check is therefore not a final payment as currency is - it sets in motion a series of transactions.
- The series of transactions put in motion can be seen in Figure 2.1: The Path of a Paper Check

Figure 2.1: The Path of a Paper Check



YOUR FINANCIAL WORLD

Free Checking Accounts Are Rarely Free

- Are free-checking accounts really free?
  - Typically there is not a monthly service charge, but there are fees for other transactions.
    - ATM out of network, certified checks, insufficient funds, overdrafts
  - Before opening an account check fees and don't overdraw your account.

Electronic Payments

- Electronic payments take the form of:
  - Credit and debit cards
  - Electronic funds transfers
  - Stored-value card
  - E-money

Electronic Payments

- Debit Cards
  - Works like a check - tells the bank to transfer funds from your account to another.
- Credit Cards
  - A promise by a bank to lend the cardholder money to make a purchase.
  - They do not represent money.

Electronic Payments

- Electronic funds transfers
  - Movements of funds directly from one account to another.
  - Most common form is the automated clearinghouse transaction (ACH).
    - Used for recurring payments like paychecks or utility bills.
    - Have surpassed the value of checks
  - Banks use electronic transfers for bank to bank transactions, sending money through Fedwire.

Electronic Payments

- Stored-value card
  - Take it to a bank or an ATM, transfer money to the card, then use the card at a merchant.
  - Limited usefulness so far, although use has grown rapidly.
  - Limited in what can be purchased with them.
  - Require specific hardware by businesses

Electronic Payments

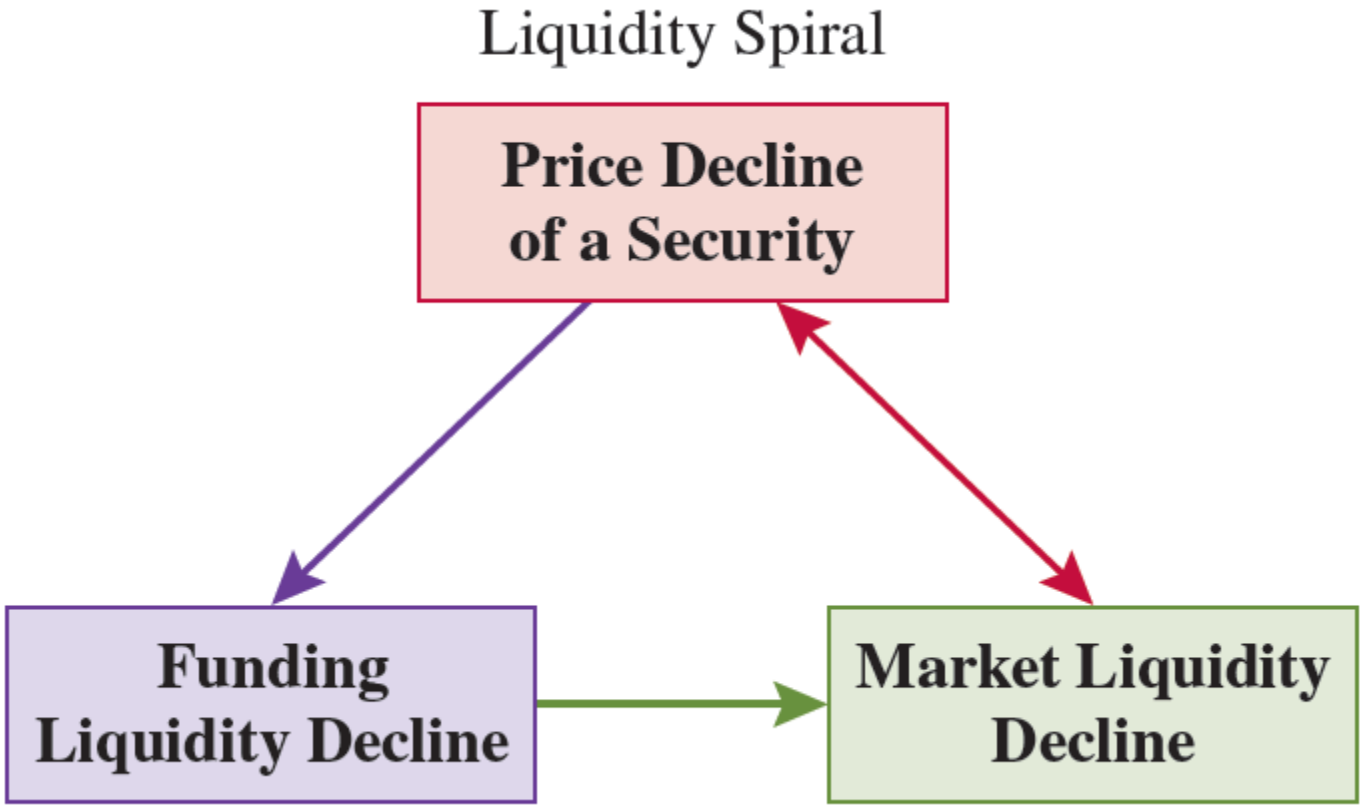
- E-money
  - Can be used to pay for purchases on the Internet or by mobile phone.
  - You open an account by transferring funds to the issuer of the e-money.
  - When shopping online, you instruct the issuer to send your e-money to the merchant.
  - Really a form of private money, so not guaranteed by the government

LESSONS FROM THE CRISIS
MARKET LIQUIDITY, FUNDING LIQUIDITY, AND MAKING MARKETS

- Market liquidity and funding liquidity are both needed to market financial markets function smoothly.
- 2007-2009 financial crisis lead to a sudden loss of liquidity.
- Before the crisis:
  - Financial institutions relied on short-term borrowing to hold long-term financial instruments.
  - They also believed markets would also be liquid.

LESSONS FROM THE CRISIS
MARKET LIQUIDITY, FUNDING LIQUIDITY, AND MAKING MARKETS

- In 2007, doubt lead to a double "liquidity shock" increasing cash holdings.
  - This reduced loan supplied intensifying the decreasing liquidity.
- One lesson: Liquidity is a highly valuable resource that can disappear when most needed.



The Future of Money

- The future of the three functions of money:
  - Means of payment: disappearing due to ease of electronic transactions.
  - Unit of account: likely to remain.
    - Will always be needed to quote values and prices because it is efficient.
  - Store of value: disappearing due to liquidity of many financial instruments.

- Bitcoin is "a decentralized peer-to-peer network that allows for the proof and transfer of ownership with the need for a trusted third party."
  - The technology used to record Bitcoin ownership is the *block chain*
- The block chain is an ever-growing public ledger of transactions that is encrypted and distributed over a network of computers.

- Advocates view Bitcoin as a new form of digital money with two advantages
  1. Its value cannot be undermined by government fiat
  2. Its users can remain anonymous
- Bitcoin lacks the key characteristics of money
- Can private currency—digital or otherwise—do a job better as money than what we currently have?

Measuring Money

- Changes in the quantity of money are related to
  - Interest Rates
  - Economic Growth
  - Inflation

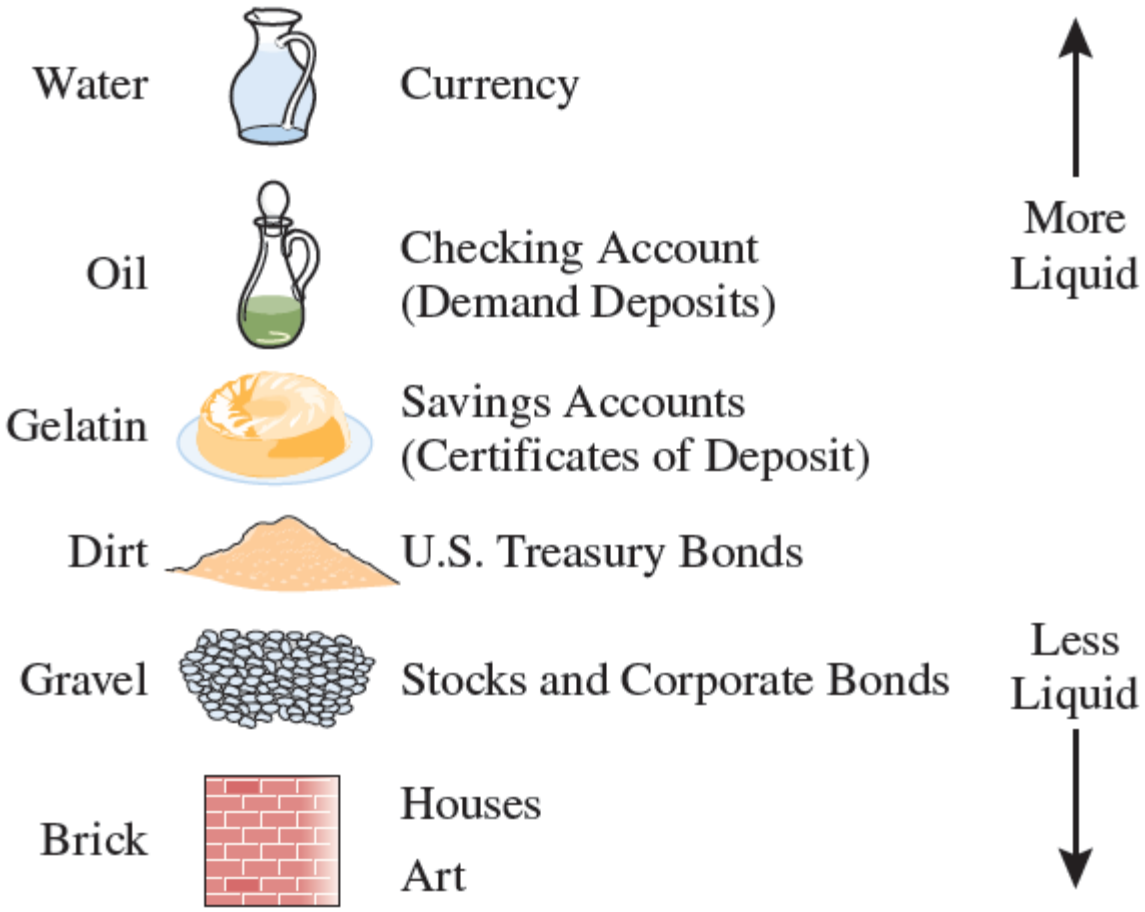
Measuring Money

- Inflation:
  - The process of prices rising.
- Inflation rate:
  - The measurement of the process.
- With inflation, you need more money to buy the same basket of goods.
- The primary cause of inflation is too much money.

Measuring Money

- The value of the means of payment depends on how much of it is circulating.
  - We therefore must be able to measure how much is circulating.
- Defining money means defining liquidity (see figure 2.2).

Figure 2.2 - The Liquidity Spectrum



Measuring Money

Different definitions of money are based upon degree of liquidity.

Drawing the line in different places has led to several measure of money called the money aggregates: M1 and M2.

M1: Narrowest definition.

Only the most liquid assets.

M2: Broader definition.

Includes assets not used as means of payment.

Table 2.1: The Monetary Aggregates

Monetary Aggregates			Value as of March 2016 (US$ billions)
M1	=	Currency in the hands of the public	1,358.9
	+	Traveler's checks	2.4
	+	Demand deposits	1,266.7
	+	Other checkable deposits	519.3
		Total M1	**3,147.3**
M2	=	M1	
	+	Small-denomination time deposits	394.8
	+	Savings deposits and money-market deposit accounts	8,312.0
	+	Retail money-market mutual fund shares	714.6
		Total M2	**12,568.6**

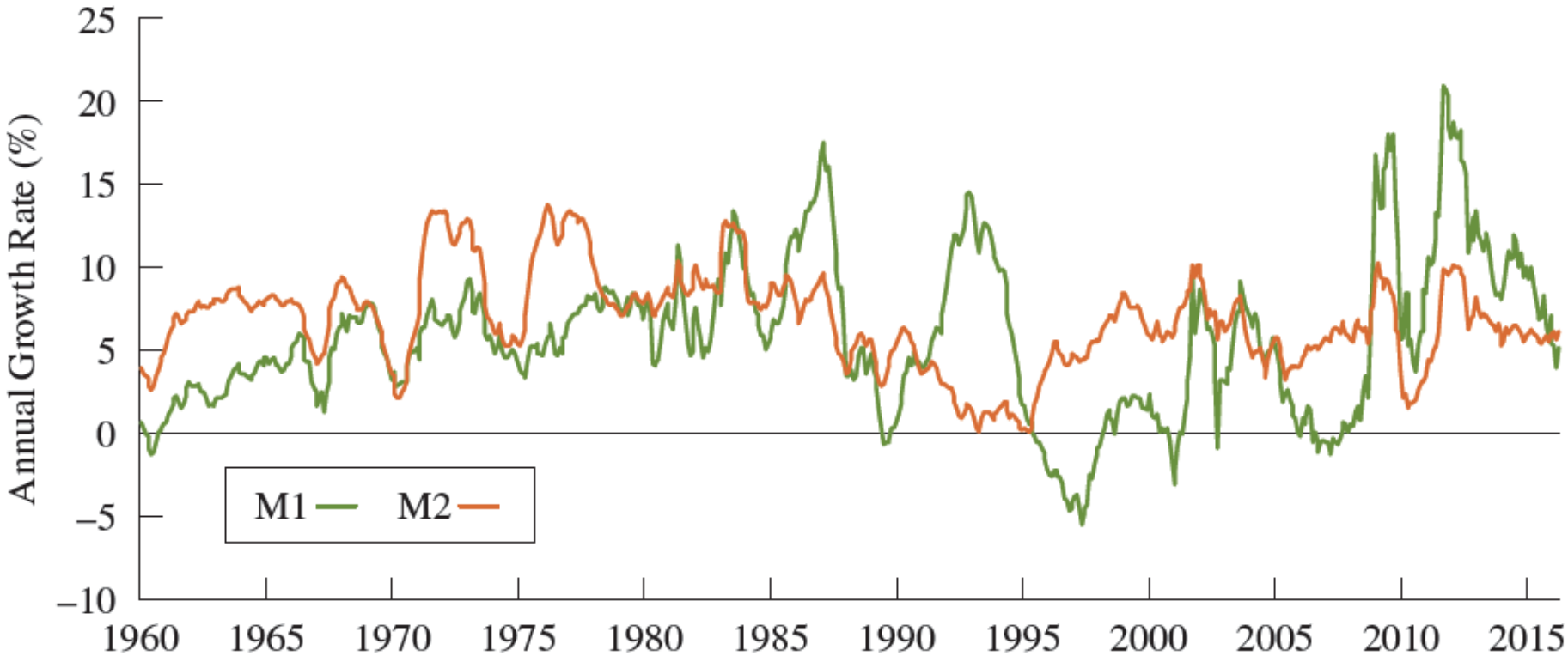
Measuring Money

- What do the money aggregates mean?
  - As of the first quarter of 2016, nominal U.S. gross domestic product (GDP) was $18,230 billion.
  - Using the data in Table 2.1:
    - GDP is almost six times larger than M1.
    - GDP is nearly 45 percent larger than M2.

Measuring Money

- Which M do we use to understand inflation?
  - Until the early 1980's we used M1.
  - But with changes in accounts, M2 became more useful.
  - M2 represents nearly one-half of GDP, so M1 is no longer a useful measure of money.
  - Figure 2.3 shows the M's growth rates.

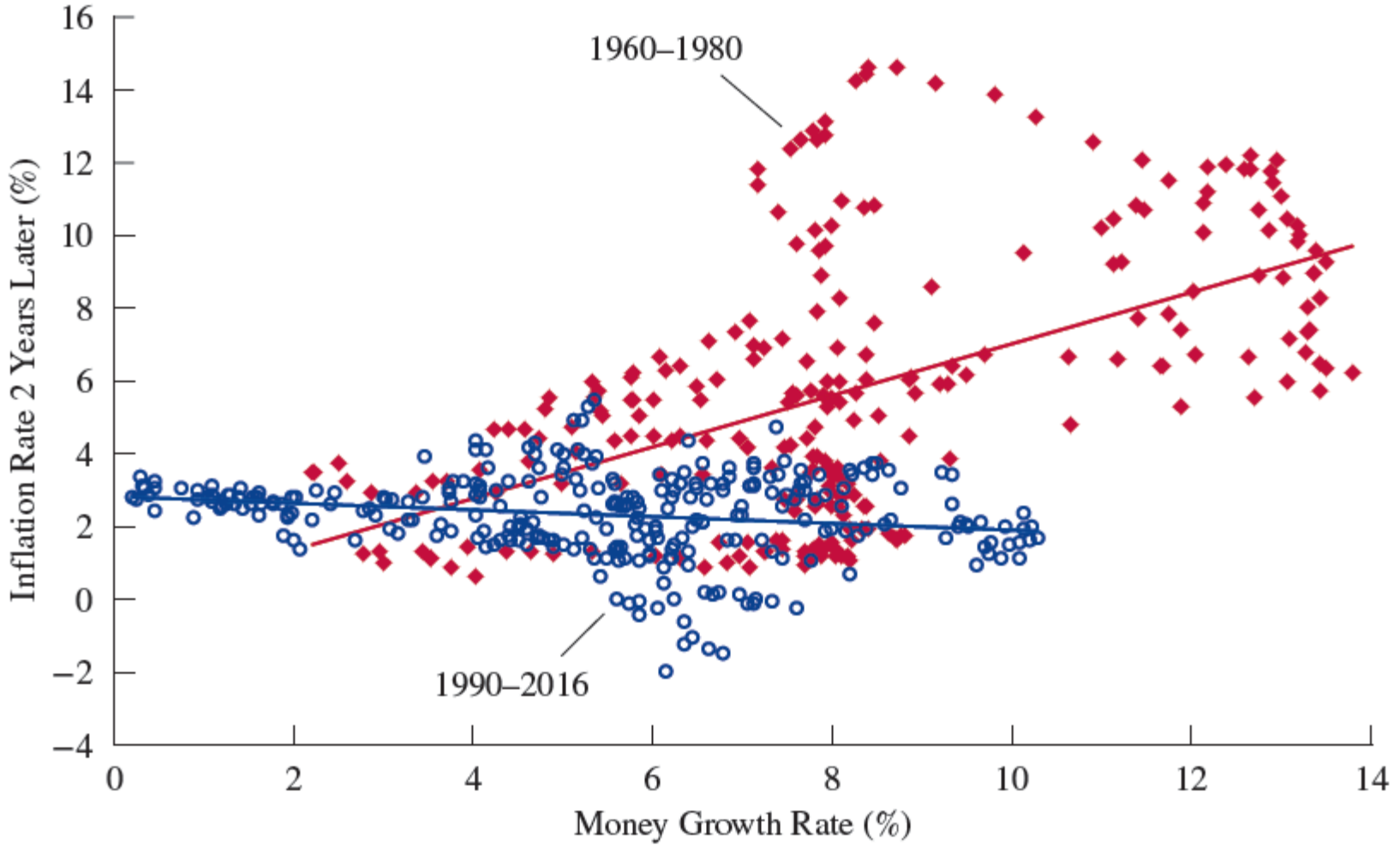
Figure 2.3: Growth Rates of the Money Aggregates



Measuring Money

- How useful is M2 in tracking inflation?
  - When the quantity of money grows quickly, it produces high inflation.
  - Figure 2.4 shows the inflation rate versus M2 two years earlier for the U.S.
    - Positive correlation up until 1980.
    - From 1990-2016 – virtually no correlation.
  - Growth in M2 stopped being a useful tool for forecasting inflation.

Figure 2.4: Money Growth and Inflation



Measuring Money

- Why does M2 no longer predict inflation?
  - Maybe the relationship only applies at high levels of inflation.
  - Maybe it only shows up over longer periods of time.
  - Maybe we need a new measure of money.
- We do know that at low levels of money growth, inflation is likely to stay low.

TOOLS OF THE TRADE

The Consumer Price Index

- Computing CPI Inflation
  - Survey people to see what they bought.
  - Figure out what it would cost to buy the same basket of goods & services today.
  - Compute the percentage change in the cost of the basket of goods.

$$CPI = \frac{\text{Cost of Basket in Current Year}}{\text{Cost of Basket in Base Year}} \times 100$$

Table 2.2: Computing the Consumer Price Index

Year	Price of Food	Price of Housing	Price of Transportation	Cost of the Basket	Consumer Price Index
2017	$100	$200	$100	$150	100
2018	110	205	140	165	110
2019	120	210	180	180	120

$$\text{Inflation Rate } 2018 = \frac{\text{CPI}_{2018} - \text{CPI}_{2017}}{\text{CPI}_{2017}} \times 100$$

APPLYING THE CONCEPT
WHERE ARE ALL THOSE $100 BILLS?

- In 2016 the public held about $1.35 trillion in U.S. currency.
  - You can compare this to each person holding $4,200.
- Three-fourths of this money was in $100 bills.
- Many of these bills are in other countries.
- People in other countries hold other currencies that are more stable than their own.