EE432 Monetary Theory and Policy

Lecture 11 Money Growth and Money Demand

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Outline

- Why We Care about Monetary Aggregates
- The Quantity Theory and the Velocity of Money
- The Demand for Money

Chapter 20

Money Growth, Money Demand, and Modern Monetary Policy

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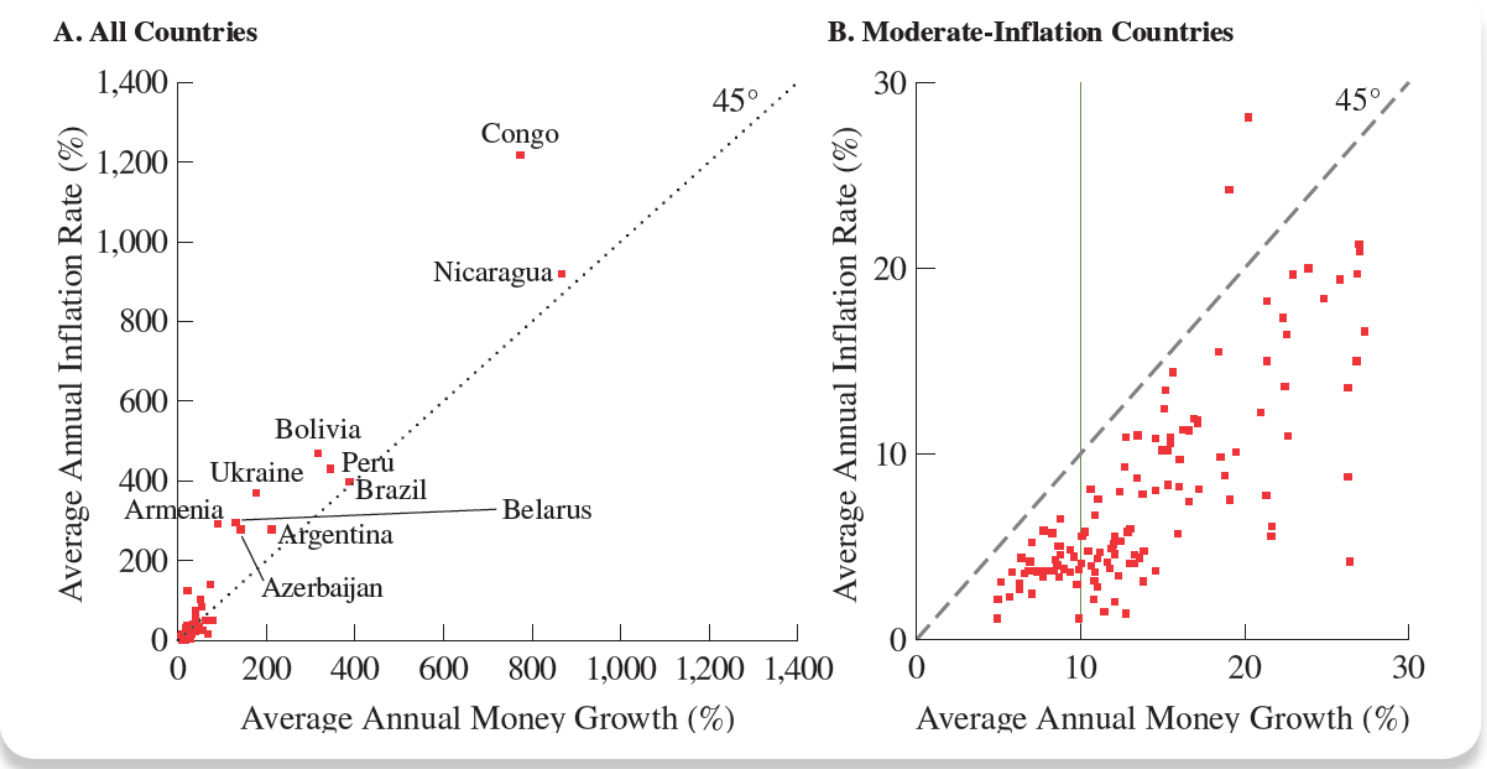
Why We Care about Monetary Aggregates

Why We Care about Monetary Aggregates

Figure 20.1 Inflation Rates and Money Growth



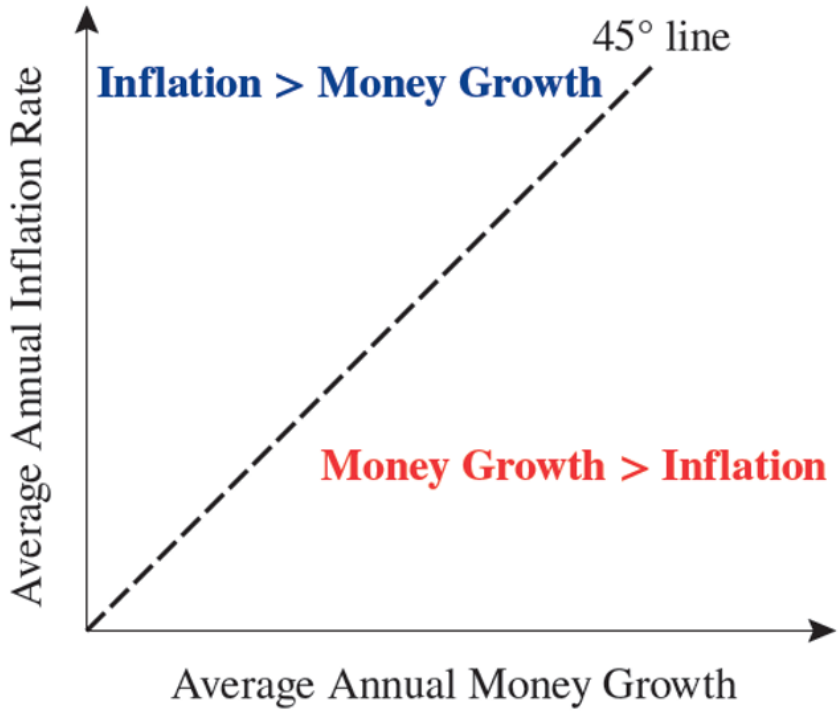
Inflation was computed from each country's analog to the consumer price index; money is the rough equivalent of M2. Data are for the 30 years beginning in 1980.

SOURCE: These figures are based on data from the International Monetary Fund's International Financial Statistics.

Every country with ***high inflation*** has ***high money growth***. To avoid sustained episodes of high inflation, a **central bank** must be ***concerned*** with **persistent rapid money growth**.

Why We Care about Monetary Aggregates

Figure 20.2 Money Growth and Inflation



In general, **countries with very high inflation** tend to ***lie above the line*** and *countries with moderate to low inflation* tend to *fall below* it.

Why We Care about Monetary Aggregates

- When the **currency** that *people are holding* **loses value very rapidly**, they will ***spend as quickly as possible*** - the *same effect* on inflation *as an increase in money growth*.
- By **limiting** the ***rate*** at which they ***purchase securities***, *policymakers can* **control** the ***rate of M2 grow***.
- It is *impossible* to have ***high, sustained inflation*** *without* ***monetary accommodation***.

The Quantity Theory and the Velocity of Money

The Quantity Theory and the Velocity of Money

- Thinking about the **value or purchasing power** in terms of the ***goods*** needed *to get* ***money*** *to pay* - the ***impact of inflation***.
- Given steady demand, an ***increase*** in the **supply of money** drives the **price of money** ***down***, *requiring more money* - ***inflation***.
- If the central bank **continuously floods** the economy **with large amounts of money**, ***inflation will reach very high levels***.

Velocity and the Equation of Exchange

- The *number of dollars used* is the **quantity of money** in the economy: **M**
- The *number of times each dollar is used* is called the **velocity of money: V**
- **MV** represents the ***value of transactions***.

Velocity and the Equation of Exchange

- Everyone **purchases** *counted in* **nominal GDP** requires the **use of money**.

$$(\text{Quantity of Money}) \times (\text{Velocity of money}) = \text{Nominal GDP}$$

- ***M*** is the **quantity of money**, ***V*** is the **velocity** and **nominal GDP** can be:
  - The ***price level***, ***P*** times the ***quantity of real output***, ***Y***.

Velocity and the Equation of Exchange

- We can ***rewrite*** the previous equation as:

$$MV = PY$$

- This is called the **equation of exchange**, and tells us that the ***quantity of money*** *multiplied by its* ***velocity*** *equals the level of* ***nominal GDP***.

Velocity and the Equation of Exchange

- We can ***rewrite*** the equation to allow *for the percentage change in each factor*.

$$MV = PY$$

$$\%\Delta M + \%\Delta V = \%\Delta P + \%\Delta Y$$

- ***Money growth*** *plus* ***velocity growth*** *equals* ***inflation*** *plus* ***real growth***.

The Quantity Theory of Money

- Suppose that there are ***no important changes*** occur in **payment methods** or the ***cost of holding money***.
  - If the **interest rate is fixed** and there is ***no financial innovation***, then **velocity will be constant**.
- Also assumed that **real output** is *determined* solely *by* **economic resources** and **production technology**, so it too is **fixed in the short run**.

The Quantity Theory of Money

- *Irving Fisher* concluded that **money growth *translates directly into*** **inflation**, an assertion that is termed the **quantity theory of money**.

The Quantity Theory of Money

- We can ***reinterpret*** the **quantity theory of money** to describe the ***equilibrium*** between ***money demand*** and ***money supply***.

- **Money demanded (M^d)** equals the **total value of transactions *divided*** by the **velocity of money (V).**

The Quantity Theory of Money

- For the economy as a whole, **the demand for money** equals **nominal GDP *divided*** by **velocity**:

$$M^d = \frac{1}{V} PY$$

- The **supply of money (M^S)** is *determined* by the ***central bank*** and the ***behavior of the banking system***.
- *Assuming* ***velocity*** and ***real output*** are **constant**, we can conclude that ***money growth*** equals ***inflation***.

The Quantity Theory of Money

The **quantity theory of money** *accounts for* some important characteristics:

1. It *tells us* why **high inflation** and **high money growth** go together.
2. It explains the tendency for ***moderate- and low-inflation countries*** to fall *below* the **45-degree line**.

The Quantity Theory of Money

- **Money growth** tends to be ***higher*** than **inflation** in those countries because they are ***experiencing*** **real growth**.
- If **velocity** is constant, then **money growth** equals the ***sum*** of **inflation** and **real growth**.

The Quantity Theory of Money

- At a *given level of money growth*, the **higher** the level of **real growth**, the ***lower*** the level of ***inflation***.
- In **countries *that are growing***, **inflation** will be ***lower than*** **money growth**, causing their *economies to fall below the 45-degree line*.

The Facts about Velocity

- If the **velocity of money** is ***constant***, it means the **trend in real growth** is *determined by* the **structure of the economy** and the **rate of technological process.**
  - This means countries **could control inflation** *directly by* **limiting money growth**.

The Facts about Velocity

- This logic led *Milton Freidman* to conclude that **central banks** should ***simply set money growth*** at a **constant rate**.
  - **M1 and M2 *should grow*** at a **rate** equal to the ***rate of real growth*** plus the ***desired level of inflation***.

The Facts about Velocity

- To make the rule viable, he **suggested *changes in regulations*** that would:
  - **Limit banks' discretion** in ***creating money***, and
  - ***Tighten the relationship*** *between* the **monetary aggregates** and the **monetary base**, **reducing fluctuations** in the **money multiplier**.
- *For example, an* ***increase in the reserve requirement*** *or* ***restrictions on the number and types of loans banks could make****.*

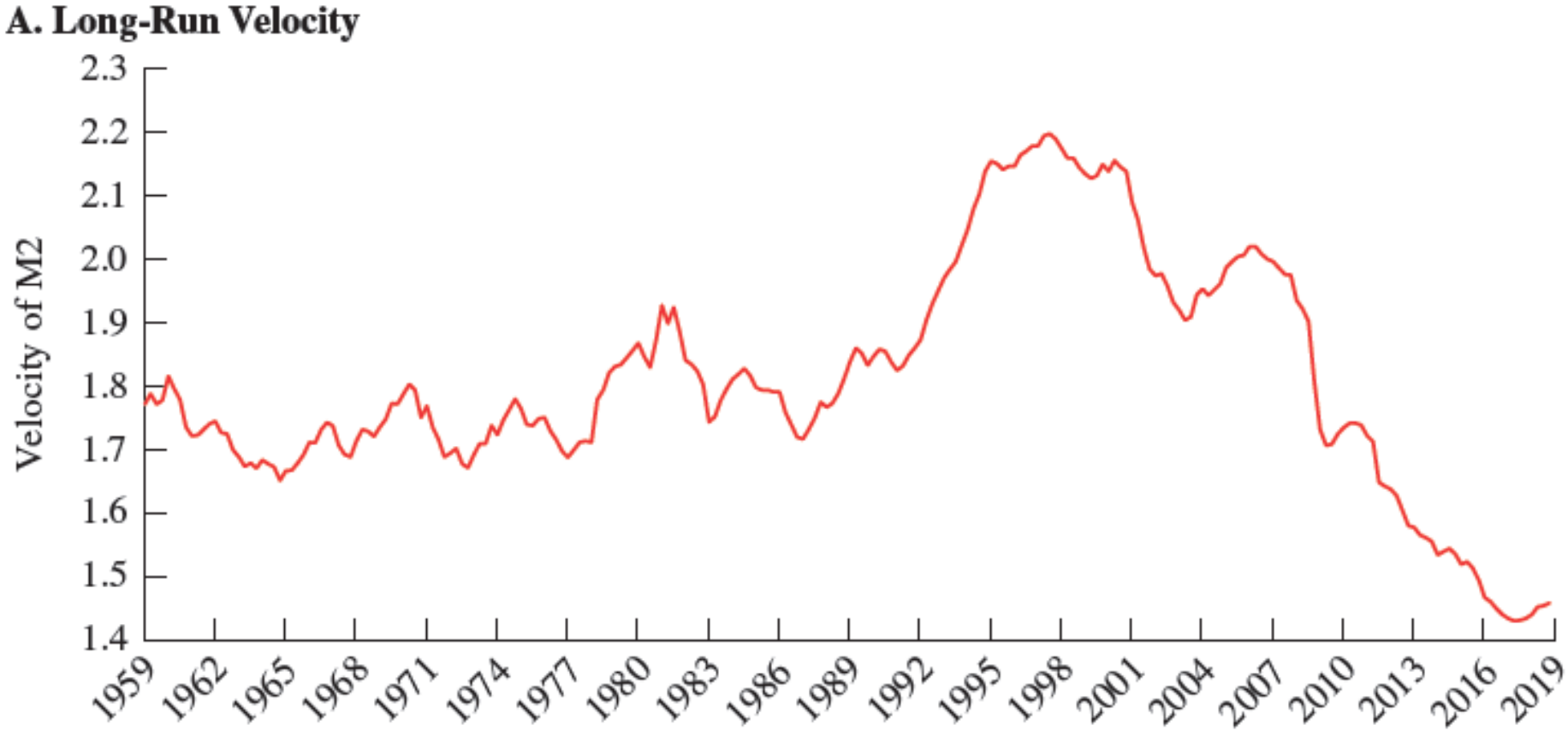
The Facts about Velocity

- But Friedman's recommendation that the **central bank** should **keep money growth constant** would ***stabilize inflation*** *only if* ***velocity were constant***.
- In countries with ***high levels of inflation***, ***changes in velocity*** *can probably be* ***ignored***.
- But in countries where *inflation rate is below 10% per year*, **changes in velocity** could have a ***significant impact*** on the ***relationship*** between **money growth** and **inflation**.

The Facts about Velocity

- Historical data seem consistent with Fisher's conclusion: *in the **long run**, the **velocity of money is stable**, so that* **controlling inflation** *means **controlling the growth of the money aggregates**.*

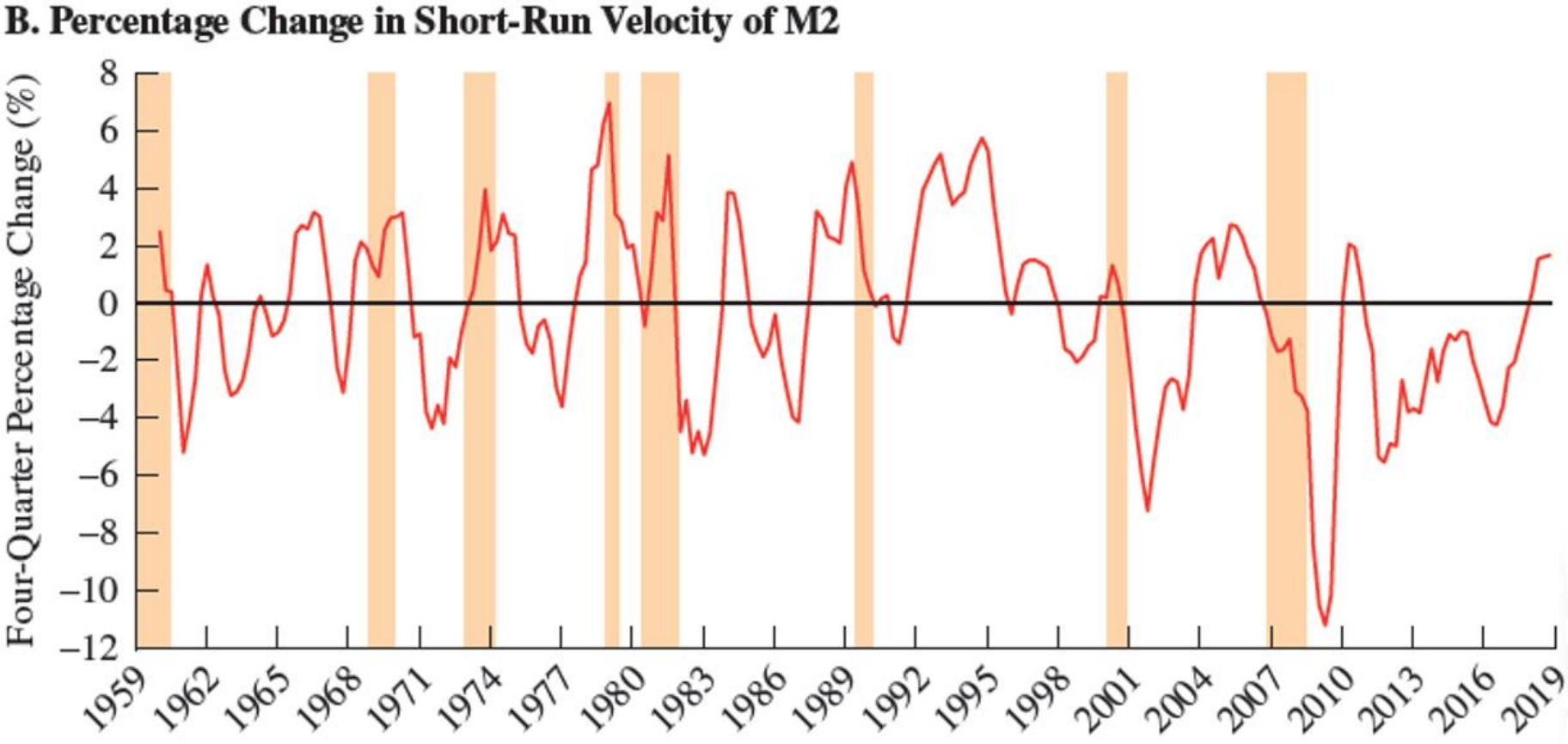
The Velocity of M2, 1959-2019



The Facts about Velocity

- **Central bankers** are ***concerned about inflation*** *over months and quarters*, **not years**.
- The **monetary aggregates**, even broad ones, ***can be useful guides*** to ***short-term policy*** **only** to the extent that they **signal changes** in **inflation** *during the* ***periods*** *monetary policymakers* ***care about***.

The Velocity of M2, 1959-2019



The Facts about Velocity

- Notice the **increase in velocity** in the *late 1970s and early 1980s*.
- This was a period of both **high nominal interest rates** and **significant financial innovations**.
- Together these ***reduced*** *the* **amount of money individuals held** for a given level of transactions, ***raising*** the **velocity of money**.

The Facts about Velocity

- These data clearly suggest that **fluctuations** in the ***velocity of money*** are *tied to* **changes in people's desire to hold money**.
- Policymakers *must understand* the **demand for money.**

The Demand for Money

The Transactions Demand for Money

- The **quantity of money** people ***hold for transactions purposes*** depends on their
  - Nominal **income**,
  - The **cost of holding money**
  - The availability of **substitutes**
- The **higher people's nominal income**, the ***more*** they ***will spend***, *needing more money*.

The Transactions Demand for Money

- Deciding ***how much money to hold*** depends on the costs and benefits.
- **Benefits**: ***Holding money*** allows people ***to make payments.***
- The cost is based on **opportunity cost**.
  - The ***interest*** that people ***lose*** in ***not buying an*** **interest-bearing bond** is the *opportunity cost of holding money*.

The Transactions Demand for Money

- For a *given cost of switching*, as the **nominal interest rate rises**, people *reduce their checking account balance*, **shifting *funds*** into **higher-yield investments**.
- The **higher** the **nominal interest rate**, the **higher** the **opportunity cost of holding money**, the ***less money*** individuals ***will hold*** for ***transactions***, and the **higher** the **velocity of money.**

The Transactions Demand for Money

- At **high** levels of **inflation**, ***money is losing value*** *very quickly*.
- People respond to the **high cost of holding money** by *keeping it as little as possible.*
  - They therefore ***purchase durable goods*** that have *zero real return* - ***better than negative return on currency***.
- This **relationship** explains why **inflation** *tends to* **exceed money growth** in *high-inflation countries*

The Transactions Demand for Money

- The anxious spending ***drives up*** the **velocity of money.**
- Because *high inflation* brings an *increase in velocity*, ***inflation*** must be higher than ***money growth*** in those countries.

The Transactions Demand for Money

- The **transactions demand for money** is *affected* by ***technology***.
- **Financial innovation** allows people to ***limit*** *the amount of* ***money they hold***.
- This ***lowers*** the **money holdings** at a given level of income.
  - This increases the **velocity** of your money.

The Transactions Demand for Money

- We all **hold money** to ***insure*** ourselves ***against*** **unexpected expenses**.
- We call this the **precautionary demand for money**
- The *higher* the level of ***uncertainty*** about the future, the **higher the demand for money** and the *lower the velocity of money* will be.

The Portfolio Demand for Money

- As a *store of value*, money provides *diversification* when **held** *along with* a wide variety of **other assets**.
- The **demand for bonds** *depends on* several factors including:
  - **Wealth**
  - The **return** *relative to* ***alternative investments***
  - **Expected future interest rates** on *bonds*
  - **Risk** *relative to* ***alternative investments***
  - **Liquidity** *relative to* ***alternative investments***

The Portfolio Demand for Money

- As **wealth *rises***, the *quantity of all these investments*, including **money**, ***rises*** with it.
- A ***decline*** in **bond yields** will ***increase*** the portfolio **demand for money**.
- When **interest rates rise**, ***bond prices drop*** and bondholders *suffer a capital loss*.
  - **bonds will become less attractive** than *money*.
- When **interest rates are expected to rise**, ***money demand goes up.***

The Portfolio Demand for Money

- If a **sudden decrease in the liquidity of stocks**, **bonds**, or **other assets** occurred, we would expect to see an **increase** *in the* **demand for money.**

End of lecture