

Business Cycles, Unemployment, Inflation, and Growth

Business Cycles

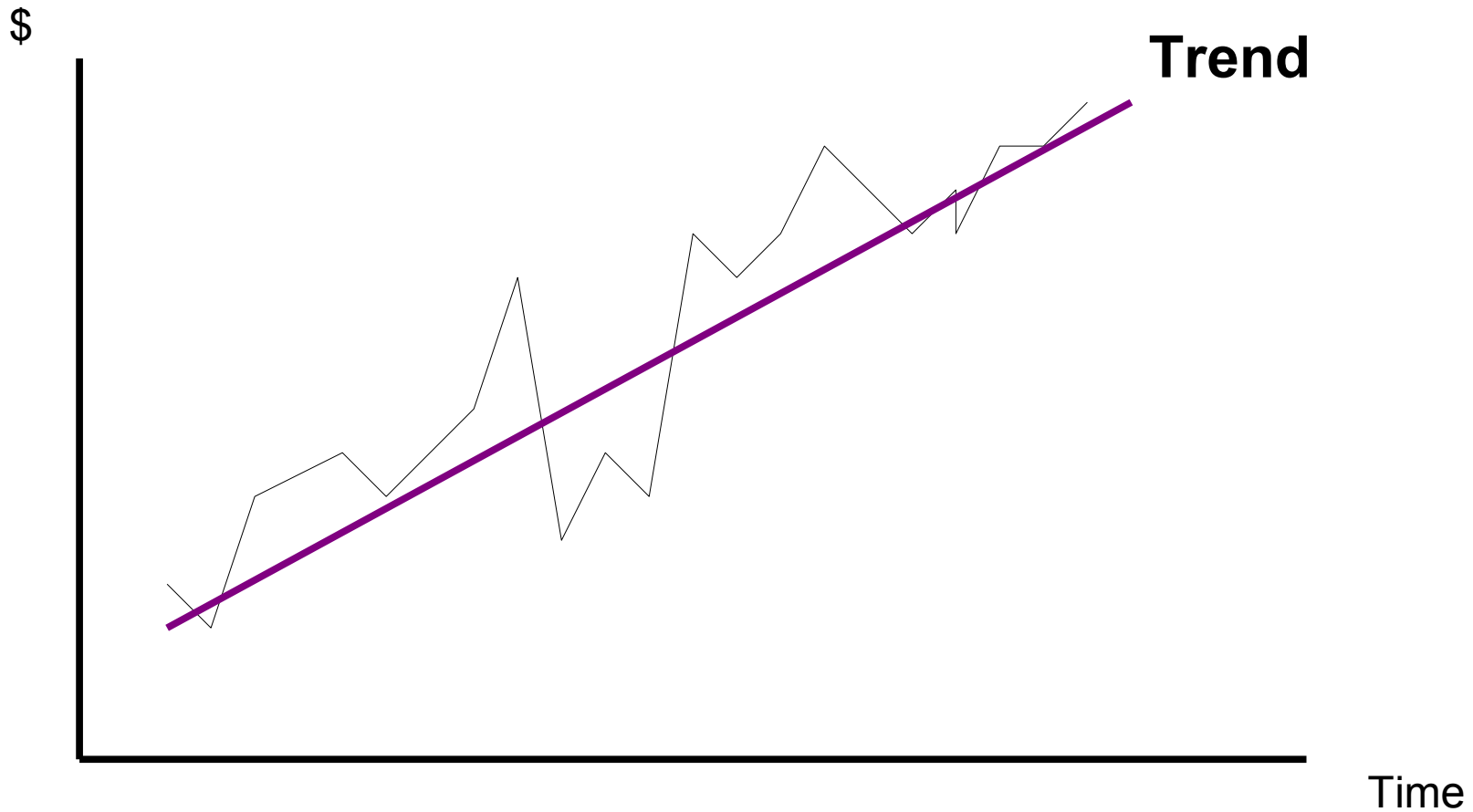
- Economic activity is NOT constant.
- There are periods where growth, unemployment, and inflation vary.
- Patterns are evident but not reliably predictable.

Business Cycles

Types of economic variation

- Trend
- Seasonal
- Cyclical
- Stochastic

Business Cycles

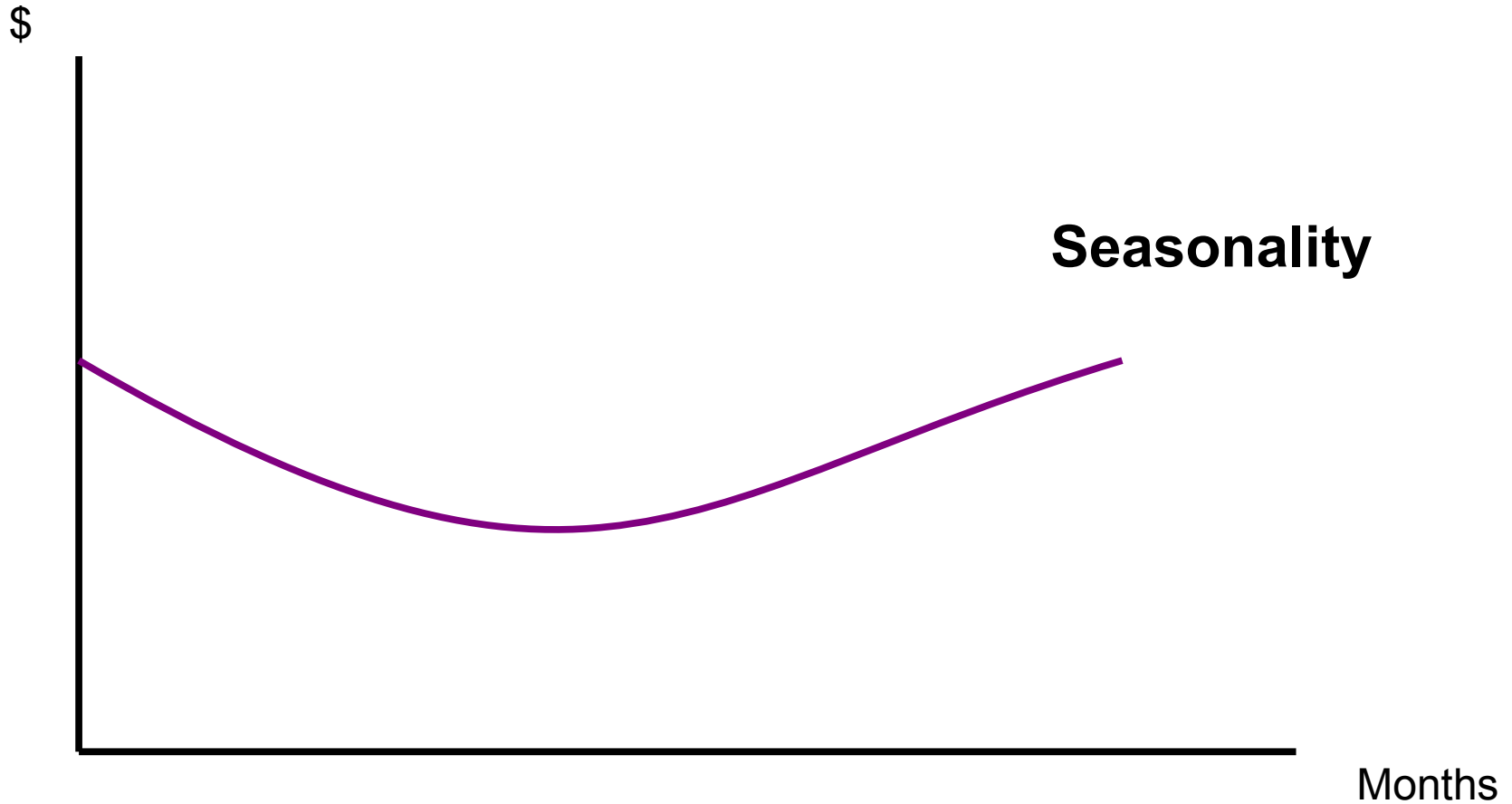


Business Cycles

Trend

- Long term constant change in economic activity.
- Everyone hopes it is growth, but that does not have to be the case.
- USA has a real growth rate close to 3%.

Business Cycles

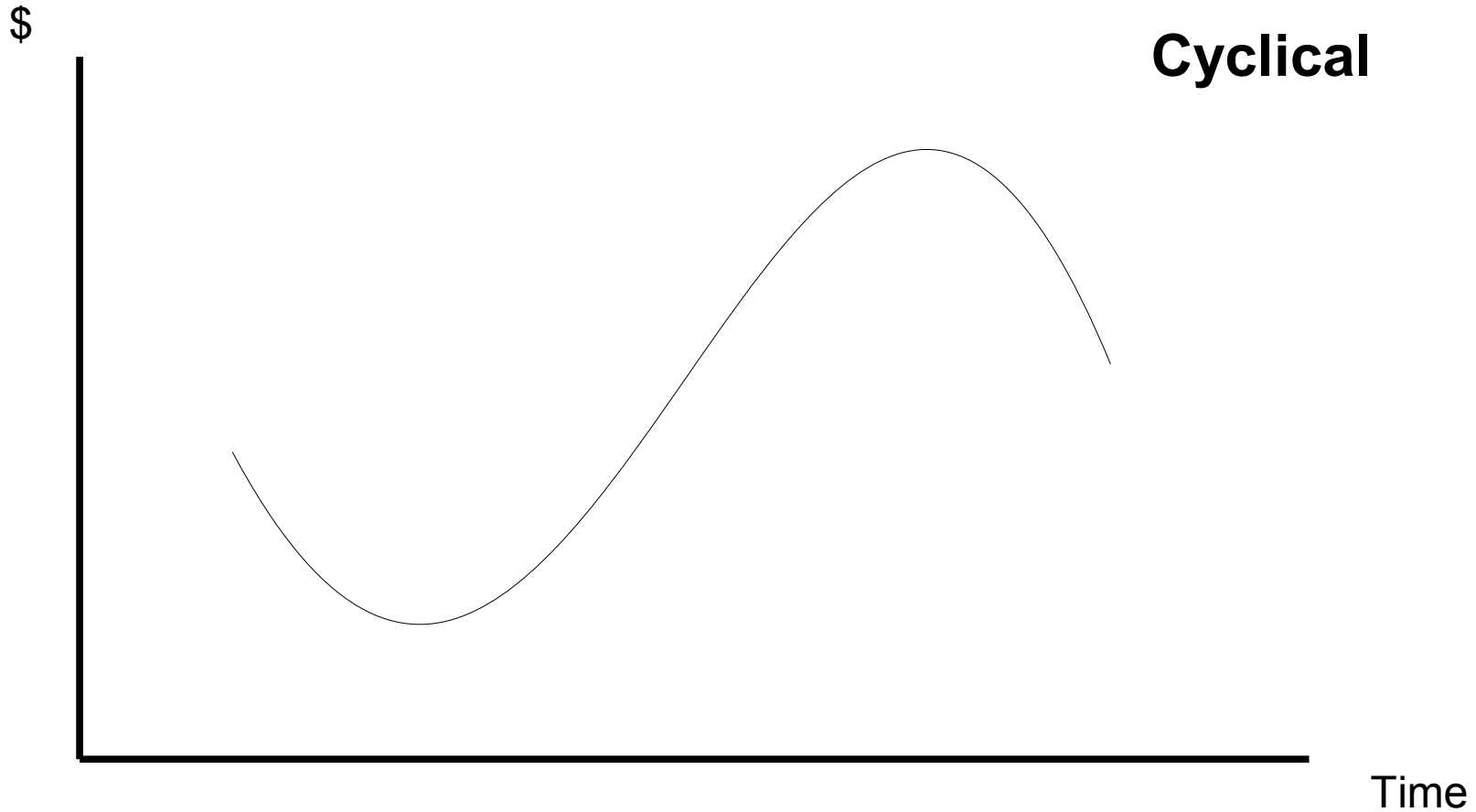


Business Cycles

Seasonal

- Periodic and quite predictable.
- Often economic data is adjusted to remove the seasonality element to reveal trends.

Business Cycles

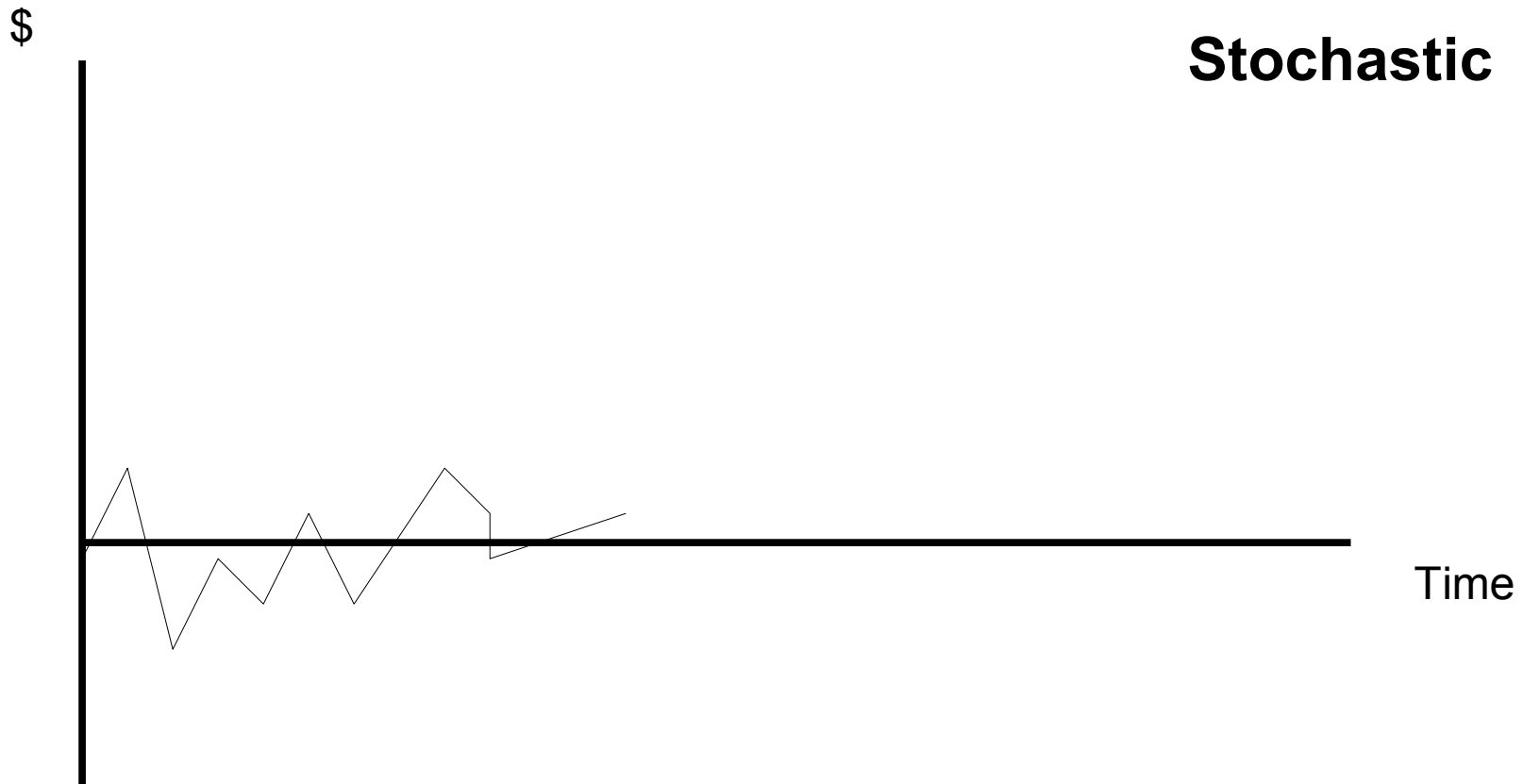


Business Cycles

Cyclical

- Classic variation of economic activity that is periodic and irregular.
- Has such important effects on economic activity that governments engage in policy actions to control or ameliorate the business cycle.

Business Cycles

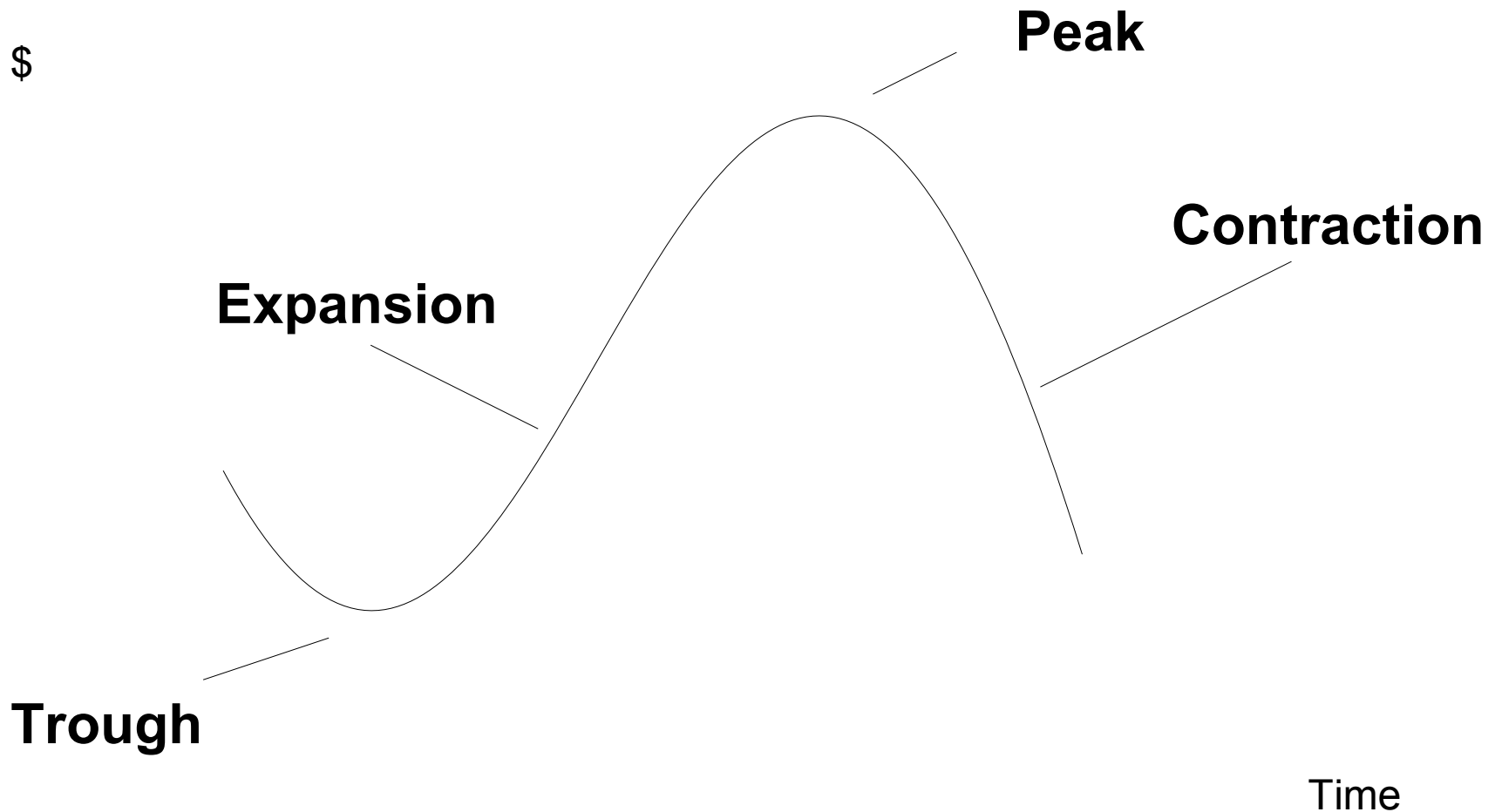


Business Cycles

Stochastic

- Variation strictly due to chance.
- Unpredictable and nonperiodic

Phases of the Business Cycle



Phases of the Business Cycle

- Peak – turning point after an expansion
- Expansion – a period of economic growth
- Trough – turning point after a contraction
- Contraction – a period of economic decline

Causes of Business Cycles

- Internal Causes
- External Causes

Causes of Business Cycles

Internal Causes

- Variation caused by the system itself.
- Examples:
 - Credit cycle
 - Inventory cycle
 - Profit cycle
- Felt to be the major reason why we will always have business cycles.

Causes of Business Cycles

External Causes

- Demand Shocks
- Supply Shocks

Causes of Business Cycles

Demand Shocks

- Affect demand such as tax cuts, inflation, consumer confidence
- Most business cycles are thought to be demand side problems.
- Demand-Pull inflation

Causes of Business Cycles

Supply Shocks

- Shortage of key inputs, or unexpected price increases of inputs
- Famous example: oil
- Cost-Push inflation

Problems of Business Cycles

Problems Caused by Business Cycles

- Economic expansions often overheat causing the problem of inflation
- Economic contractions often trigger the problem of unemployment
- Periods of contraction and expansion cause uncertainty which makes investment risky

Business Cycles Policies

Policies Used to Alleviate Problems

- Expansionary fiscal and monetary policy are used to increase demand during periods of economic contraction
- Contractionary fiscal and monetary policy are used to lower excessive demand during periods of economic expansion

Indexes

Definition of an Index

- A numeric value that summarizes a level of activity such as prices, production, etc.

Index Construction

Construction of Indexes

- Mathematical Technique/Structure
- Inclusion/Exclusion

Index Construction

Construction of Indexes/Structure

- Composite Indexes
- Diffusion Indexes

Index Construction

Composite Indexes

- Several data series aggregated together
- Mathematical method of aggregation is important as different methods produce different results

Index Construction

Composite Indexes

- Can be equally weighted, market weighted (like the S&P 500 stock index), or other weighting scheme.
- Market weighted series have some data components that have more influence on the mean than other components

Index Construction

Composite Indexes

- Typically, an index number is tracked.
- Must be compared to earlier result to calculate change.

Index Construction

Diffusion Indexes

- Indicates breath and strength of movement of data series.
- Example: Out of 10 stocks, 2 increased but 8 decreased even though the composite index went up.

Index Calculation

Calculating a Simple Index

- Let's use stock prices as an example
- We will construct an index using price data for the following stocks:

	12/01	12/02
Aleph	\$10.00	\$14.00
Bet	\$20.00	\$22.00

Index Calculation

Calculating a Simple Index

- On 12/01, the index value will be:

$$\frac{10.00 + 20.00}{10.00 + 20.00} = 30/30 = 1.00 \text{ or } 100$$

Index Calculation

Calculating a Simple Index

- On 12/02, the index value will be:

$$\frac{14.00 + 22.00}{10.00 + 20.00} = 36.00/30 = 1.20 \text{ or } 120$$

- Note: this a 20% increase, $(120-100)/100$

Index Calculation

Calculating a Simple Index

- There are several ways to present index numeric data.
- One way is to simply state the raw index number such as 14,000 for the Dow Stock Index.
- Another way is to state the change in absolute amount such as 43 or as a percentage such as 2.5%.

Index Calculation

Calculating a Simple Index

- In the previous example, both stocks were equally weighted. In the stock market, stocks are not equally weighted. A large company's stock may be 20% of the market while many stocks fall below 1%.

Index Calculation

Calculating a Simple Index

- Let's take the prior example and recalculate those values using a weighting based on market capitalization.

	# shares	12/01	12/02
Aleph	200	\$10.00	\$14.00
Bet	100	\$20.00	\$22.00

Index Calculation

Calculating a Simple Index

- On 12/01, the index value will be:

$$\frac{200*10.00 + 100*20.00}{200*10.00 + 100*20.00}$$

$$= 4000/4000 = 1.00 \text{ or } 100$$

Index Calculation

Calculating a Simple Index

- On 12/02, the index value will be:

$$\frac{200*14.00 + 100*22.00}{200*10.00 + 100*20.00}$$

$$= 5000/4000$$

$$= 1.25 \text{ or } 125$$

The index has increased 25%, $(125-100)/100$

Index Calculation

Calculating a Simple Index

- Notice that the increase in the index value is greater than the simple index calculated earlier.
- This is due to Aleph receiving a heavier weighting. Aleph grew at 40% while Bet grew at 10%. The more that Aleph is weighted, the closer the index increase will be to 40%.

Index Calculation

- This gives a clear idea of how the mathematical structure (in this case, the weighting scheme) influences the outcome.
- Equal weighting vs. market value (aka market capitalization) provided different values.

Index Calculation

Simple Index Problem

Year	Index Value
01	150
02	180

Calculation of percentage change

$$(180-150) / 150 = 20\%$$

Index Problems

Problems in Using Indexes

- Mathematical techniques
- Explanatory power
- Inclusion and exclusion

Index Problems

Mathematical Techniques

- Different mathematical techniques give different results
- The method of aggregation, particularly in the use of weighting, influences the results of calculations

Index Problems

Explanatory Power

- Indexes do not explain the underlying causes or relationships
- This can limit their usefulness in forecasting future values
- Sudden changes in underlying relationships will not be reflected in index values
- Indexes often fail to predict turning points (changes) in the level of activity

Index Problems

Problems of inclusion and exclusion

- May cause the index not to be a good measure of that particular economic activity.

Index Problems

Inclusion/Exclusion

- Since an index is a summary of economic activity, it is only affected by what is included.
- It may not measure all aspects of that economic activity.

Index Problems

Inclusion/Exclusion

- In tracking economic activity for the economy as a whole, data series on specific activities are selected because they have broad economic impact, i.e. retail sales.
- Some industries/activities may not be directly impacted by retail sales, such as defense contracts.

Index Problems

Inclusion/Exclusion

- Since Wal-Mart and Target are major national retailers with significant market shares, any major change of these retailers will show up in the data for national sales.
- However, even if a minor retailer such as Brittney's Bar & Grill doubles its sales each month, it will have no impact on national data.

Index Problems

Inclusion/Exclusion

- Retail sales does not measure real estate sales.
- As real estate is a major economic activity, retail sales has a limitation if it is being used as a measure of general economic activity.

Uses of Indexes

Using Indexes to Forecast Business Cycles

- Collectively called economic indicators
- Data series are aggregated together
- Grouped as leading, lagging, and coincidental indicators.

Uses of Indexes

Leading Indicators

- Data series that rises (falls) before the general economy rises (falls).
- About a 3 to 5 month lead time.
- Very closely watched.
- False signals 50% of the time for recessions.

Uses of Indexes

Leading Indicators

- Known as LEI (Leading Economic Indicators)
- Published in different forms, main source, Conference Board
- Includes: stock market prices, unemployment claims, new housing permits, etc.

Uses of Indexes

Coincidental Indicators

- Data series that rises (falls) as the general economy rises (falls).
- Widely watched.
- Include:
 - Retail Sales
 - Unemployment Rate
 - Personal Income

Uses of Indexes

Lagging Indicators

- Data series that rises (falls) after the general economy rises (falls).
- Important in identifying the next phase in the business cycle.
- Unit Labor Costs

Inflation

Definitions of Inflation

Definitions of Inflation

- General increase in the price level
- Cost-Push Inflation: prices increase due to costs.
- Demand-Pull Inflation: excess demand bids up prices.
- Stagflation: combination of inflation and high unemployment

Causes of Inflation

Causes

- Internal
- External

Causes of Inflation

Internal

- System dynamics itself creates inflation
- Example: Expectations

Causes of Inflation

External

- Events outside of the system creates inflation
- Examples:
 - Demand side shocks such as tax cuts
 - Supply side shocks such as sudden oil price increases

Causes of Inflation

Cost-Push Inflation

- Aggregate supply shrinks compared to aggregate demand
- Often considered a supply side shock
- Causes prices to rise
- Example: oil, labor

Causes of Inflation

Cost-Push Inflation

- Costs of production could suddenly rise.
- Caused by price of inputs rising suddenly.
- Causes firms to raise price of goods.
- Example: oil prices

Causes of Inflation

Demand-pull Inflation

- Aggregate demand exceeds aggregate supply thus driving up prices
- Often considered a demand side shock
- Examples:
 - Tax cuts
 - Federal deficits
 - Very expansionary money supply

Causes of Inflation

Demand Pull Inflation

- Consumers have a sudden burst of buying power such as that given by a large tax break.
- Consumers consequently bid up prices since the quantity of goods in the short run remain unchanged.
- Government buying power could accomplish the same result.

Measurement of Inflation

Measurement

- Inflation cannot be precisely measured, only estimated.
- Inflation is commonly measured using price indexes.

Measurement of Inflation

Price Index Simple Calculation

- Let's say that the Florida Price index at the end of last year was 150.
- At the end of this year the index number is 180.
- Calculate inflation for this year.

Measurement of Inflation

Price Index Simple Calculation Solution

- Take the difference between the two index numbers $180 - 150 = 30$,
- And divide by the beginning index number. $30 / 150 = 20\%$

Measurement of Inflation

Measurement

- Laspeyre Index: uses beginning period prices or quantities as weights.
- Paasche Index: using ending period prices or quantities as weights.
- Fisher Index (chained index): is a geometrically weighted average of Laspeyre and Paasche.
- Price vs. Quantity indexes

Measurement of Inflation

Major Indexes

- CPI: Consumer Price Index
- PPI: Producer Price Index
- GDP Deflator
- COLA

Measurement of Inflation

Measurement Problems (which arise from using price indexes)

- Different mathematical procedures yield differing estimates.
- Indexes are sensitive to which items are included and excluded in the computation of the index.
- Structural changes, which may be non-inflationary, in the economy affect computational results.

Problems of Inflation

Consequences of Inflation

- Debtors gain at expense of creditors
- Savors lose value
- Investments become riskier
- Transactions are conducted using other currencies, gold, or barter.

Problems of Inflation

Consequences of Inflation/Government

- Often government is the cause of inflation.
- Since government is usually a debtor, it gains from causing inflation.
- With progressive income tax rates, inflation causes taxpayers to pay more taxes, again benefiting government.

Problems of Inflation

Consequences of Inflation/Government

- By printing money directly, the government increases its purchasing power.
- Government deficits fuel inflation as government purchases compete with private spending.
- Consequently, even if the government promises not to engage in inflationary policies, because the incentive to do so is so great, people do not believe them.

Problems of Inflation

How Society Adjusts to Inflation

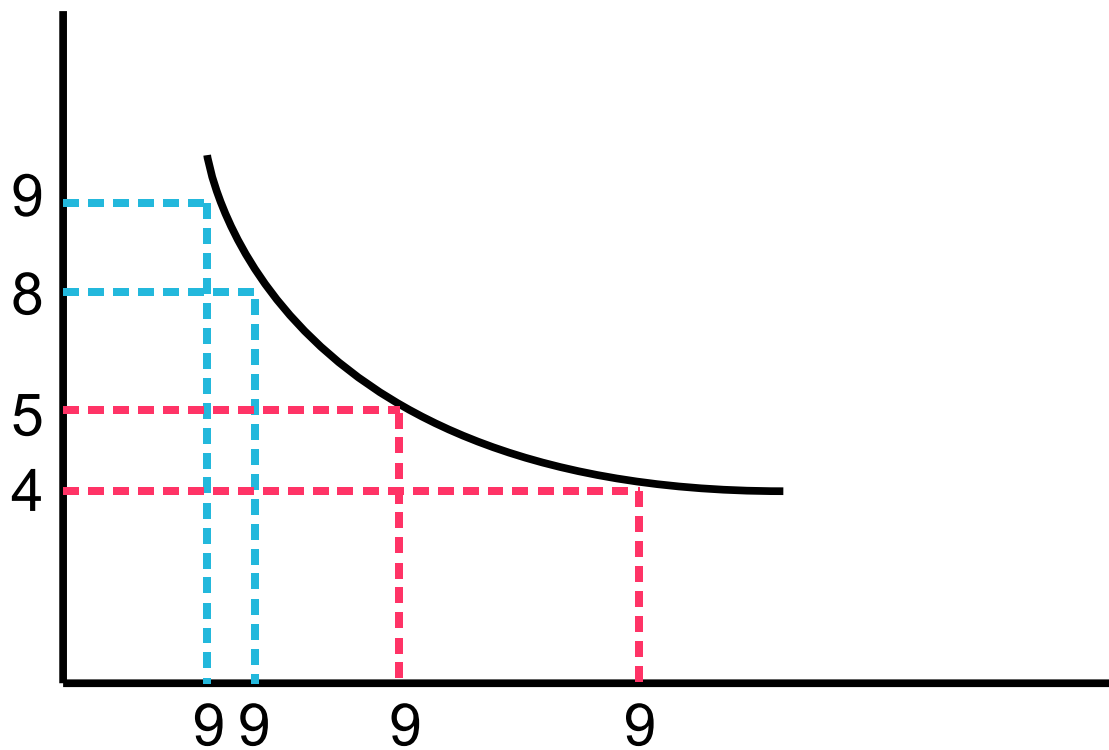
- Creditors charge much higher interest rates and lend for much shorter time periods.
- Workers and firms demand inflation indexed contracts.

Relationships between Inflation and Unemployment

- Phillips Curve
 - Shows a negative correlation between unemployment and inflation.
 - Unfortunately, high inflation and high unemployment, which is not predicted by the model, has existed.

Phillips Curve

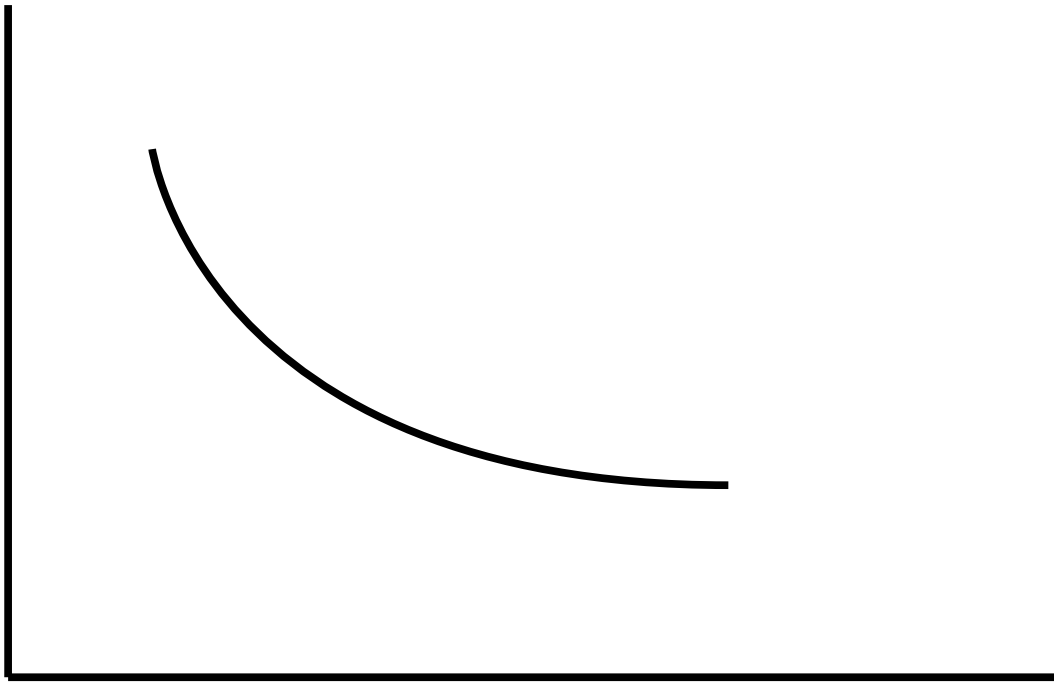
Inflation



Unemployment

Phillips Curve

Inflation



Unemployment

Policies of Inflation

Policies to Alleviate Inflation

- Since inflation is most strongly linked to excess demand policies to combat inflation focus on lowering demand

Policies of Inflation

- Contractionary fiscal policy by increasing taxes cuts into a family's budget for consumer spending
- Retailers will experience customers becoming more price sensitive

Policies of Inflation

- Contractionary fiscal policy lowers aggregate demand for goods and services due to lower government spending.

Policies of Inflation

- Contractionary monetary policy lowers aggregate demand in a couple of ways: higher interest rates which increase the cost of credit thus adversely affecting investment expenditures, thus lowering business spending.

Policies of Inflation

- Contractionary monetary policy can also restrict the supply of credit by restricting liquidity. Again, less credit lowers business spending.

Policies of Inflation

Policies to Alleviate Inflation

- Price and Wage Controls

Unemployment

Definitions

Definitions of Employment and Unemployment

- Employed
- Unemployed
- Employable Population (Civilian noninstitutional population)

Definitions

Employed

Persons 16 years and over in the civilian noninstitutional population who, during the reference week, (a) did any work at all (at least 1 hour) as paid employees; worked in their own business, profession, or on their own farm, or worked 15 hours or more as unpaid workers in an enterprise operated by a member of the family; and (b) all those who were not working but who had jobs or businesses from which they were temporarily absent because of vacation, illness, bad weather, childcare problems, maternity or paternity leave, labor-management dispute, job training, or other family or personal reasons, whether or not they were paid for the time off or were seeking other jobs. Each employed person is counted only once, even if he or she holds more than one job. Excluded are persons whose only activity consisted of work around their own house (painting, repairing, or own home housework) or volunteer work for religious, charitable, and other organizations.

Definitions

Unemployed

Persons aged 16 years and older who had no employment during the reference week, were available for work, except for temporary illness, and had made specific efforts to find employment sometime during the 4-week period ending with the reference week. Persons who were waiting to be recalled to a job from which they had been laid off need not have been looking for work to be classified as unemployed.

Definitions

- **Employable Population (Civilian noninstitutional population)**

Included are persons 16 years of age and older residing in the 50 States and the District of Columbia who are not inmates of institutions (for example, penal and mental facilities, homes for the aged), and who are not on active duty in the Armed Forces.

Causes of Unemployment

Causes & Types of Unemployment

- Frictional
- Structural
- Cyclical

Causes of Unemployment

Frictional

- Due to personal employment issues
- Jobs change, people change
- Expect an element of this to exist regardless of economic conditions.

Causes of Unemployment

Structural

- Changes in the market, new industries are born, and some die. Dying industries free up labor and capital for growing markets.
- Particularly technological change has an impact on this.
- Expect to see some of this as a health sign of a dynamic economy.

Causes of Unemployment

Cyclical

- Unemployment due to business cycle.
- Many governments try to prevent this or at least reduce the misery involved.

Causes of Unemployment

Natural Rate of Unemployment

- Sum of frictional and structural components of unemployment.
- Thought to average between 4% and 4.5%.
- Any unemployment above this is usually ascribed to the business cycle.

Employment Measures

Importance of statistics and data

- Investment, government, and individual decisions are made on the basis of published data and statistics
- Consequently, it is important to understand what is included and excluded in each statistic.

Employment Measures

Labor Force

- Sum of employed plus unemployed

Employment Measures

Unemployment Rate

- $\text{Unemployed} / \text{labor force}$

Employment Measures

- Labor Force Participation Rate

The labor force as a percent of the civilian noninstitutional population

Employment Measures

Sample Data for Calculations

Unemployed	10
Employed	90
Discouraged	20
Employable	200

- What is the unemployment rate?
- What is the employment rate?
- What is the labor force participation rate?

Employment Measures

Sample Data for Calculations

Unemployed	10
Employed	90
Discouraged	20
Employable	200

- What is the unemployment rate?
 $10 / (10 + 90) = 10\%$
- What is the employment rate?
 $90 / 200 = 45\%$
- What is the labor force participation rate?
 $(10+90) / 200 = 50\%$

Costs of Unemployment

- Unemployment imposes significant costs not just on the individual workers but also on society.

Costs of Unemployment

Okun's Law

- Any unemployment above the natural rate causes a 2.5% decrease in GDP.
- Cumulative effect of Okun's Law is important.

Costs of Unemployment

Many other societal problems show a correlation with business cycles such as:

- Crime
- Divorce
- Child Abuse
- Drug Abuse
- Alcohol Abuse

Policies to Alleviate Unemployment

Generic

- Better organization of the labor market by centralized job listings
- Job search services
- Job fairs

Policies to Alleviate Unemployment

Frictional

- Personal Counseling
- Proactive Human Resource departments

Policies to Alleviate Unemployment

Structural

- Occupational counseling
- Educational retraining
- Relocation

Policies to Alleviate Unemployment

Cyclical

- Fiscal Policies
- Monetary Policies

The End