CHAPTER
33

Aggregate Demand and Aggregate Supply

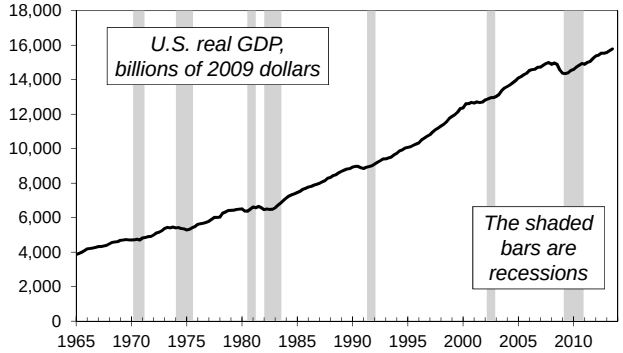
Wojciech Gerson (1831-1901)

Introduction

- Over the long run, real GDP grows about 3% per year on average.
- In the short run, GDP fluctuates around its trend.
  - **(** **)**: periods of falling real incomes and rising unemployment
  - **(** **)**: severe recessions (very rare)
- Short-run economic fluctuations are often called **business cycles**.

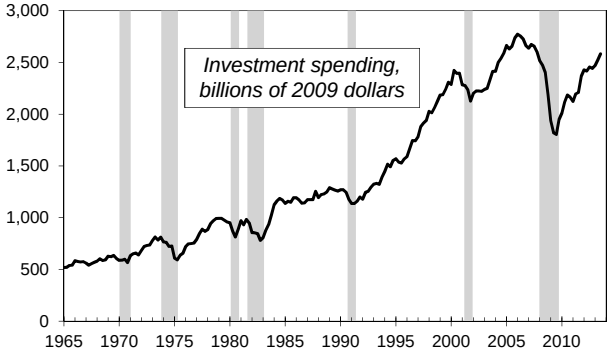
Three Facts About Economic Fluctuations

FACT 1: Economic fluctuations are irregular and unpredictable.



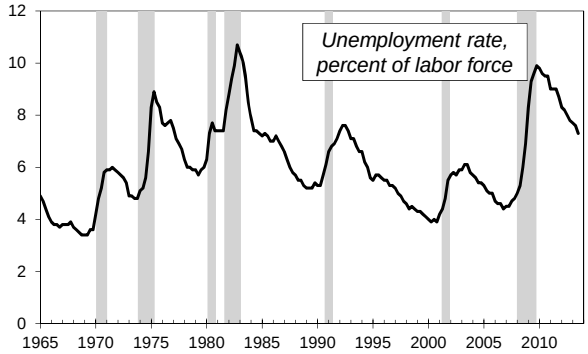
Three Facts About Economic Fluctuations

FACT 2: Most macroeconomic quantities fluctuate together.



Three Facts About Economic Fluctuations

FACT 3: As output falls, unemployment rises.



Introduction, *continued*

- Explaining these fluctuations is difficult, and the theory of economic fluctuations is controversial.
- Most economists use the **model of aggregate demand and aggregate supply** to study fluctuations.
- This model differs from the classical economic theories economists use to explain the long run.

Classical Economics—A Recap

- The previous chapters are based on the ideas of classical economics, especially:
- The ( ), the separation of variables into two groups:
  - Real – quantities, relative prices
  - Nominal – measured in terms of money
- The ( ):
  Changes in the money supply affect nominal but not real variables.

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Classical Economics—A Recap

- Most economists believe classical theory describes the world in the long run, but not the short run.
- In the short run, changes in nominal variables (like the money supply or ***P***) can affect real variables (like ***Y*** or the u-rate).
- To study the short run, we use a new model.

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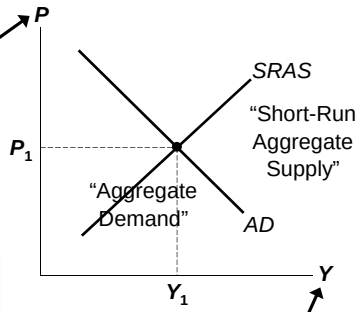
The Model of Aggregate Demand and Aggregate Supply

The price level

The model determines the eq'm price level

and eq'm output (real GDP).



Real GDP, the quantity of output

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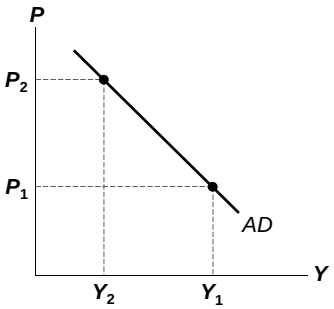
The Aggregate-Demand (*AD*) Curve

The ***AD* curve** shows the quantity of all g&s demanded in the economy at any given price level.



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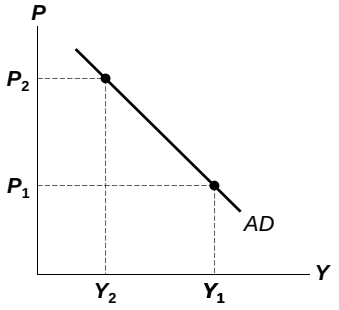
Why the *AD* Curve Slopes Downward

Y = ***C*** + ***I*** + ***G*** + ***NX***

Assume ***G*** is fixed by govt policy.

To understand the slope of *AD*, must determine how a change in ***P*** affects ***C***, ***I***, and ***NX***.



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The Wealth Effect (*P* and *C*)

Suppose ***P*** rises.

- The dollars people hold buy fewer g&s, so real wealth is lower.
- People feel poorer.

Result: ***C*** falls.

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The Interest-Rate Effect (*P* and *I*)

Suppose ***P*** rises.

- Buying g&s requires more dollars.
- To get these dollars, people sell bonds or other assets.
- This drives up interest rates.

Result: ***I*** falls.
(Recall, ***I*** depends negatively on interest rates.)

The Exchange-Rate Effect (*P* and *NX*)

Suppose ***P*** rises.

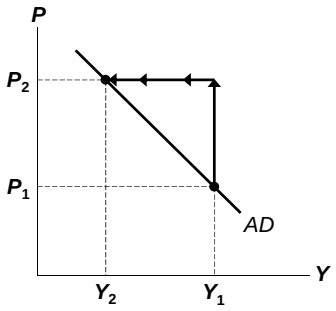
- U.S. interest rates rise (the interest-rate effect).
- Foreign investors desire more U.S. bonds.
- Higher demand for $ in foreign exchange market.
- U.S. exchange rate appreciates.
- U.S. exports more expensive to people abroad, imports cheaper to U.S. residents.

Result: ***NX*** falls.

The Slope of the *AD* Curve: Summary

An increase in ***P*** reduces the quantity of g&s demanded because:

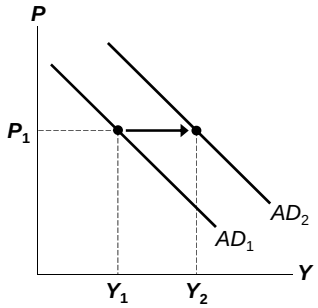
- the wealth effect (***C*** falls)
- the interest-rate effect (***I*** falls)
- the exchange-rate effect (***NX*** falls)



Why the *AD* Curve Might Shift

Any event that changes ***C***, ***I***, ***G***, or ***NX***—except a change in ***P***—will shift the *AD* curve.

Example:
A stock market boom makes households feel wealthier, ***C*** rises, the *AD* curve shifts right.



Why the *AD* Curve Might Shift

- Changes in ***C***
  - Stock market boom/crash
  - Preferences re: consumption/saving tradeoff
  - Tax hikes/cuts
- Changes in ***I***
  - Firms buy new computers, equipment, factories
  - Expectations, optimism/pessimism
  - Interest rates, monetary policy
  - Investment Tax Credit or other tax incentives

Why the *AD* Curve Might Shift

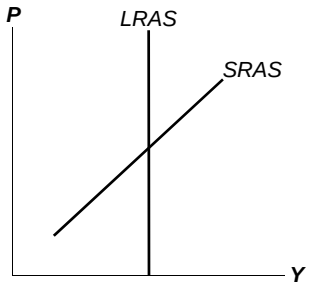
- Changes in ***G***
  - Federal spending, e.g., defense
  - State & local spending, e.g., roads, schools
- Changes in ***NX***
  - Booms/recessions in countries that buy our exports
  - Appreciation/depreciation resulting from international speculation in foreign exchange market

The Aggregate-Supply (*AS*) Curves

The ***AS* curve** shows the total quantity of g&s firms produce and sell at any given price level.

AS is:

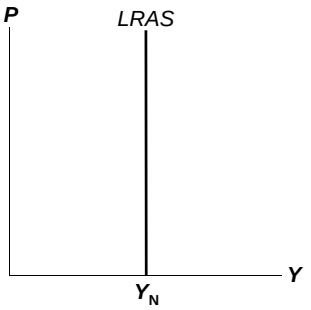
- upward-sloping in short run
- vertical in long run



The Long-Run Aggregate-Supply Curve (*LRAS*)

The **natural rate of output** (Y_N) is the amount of output the economy produces when unemployment is at its natural rate.

Y_N is also called **potential output** or **full-employment output**.

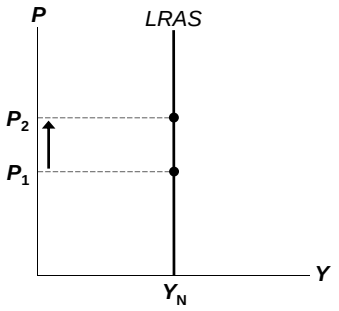


Why *LRAS* Is Vertical

Y_N determined by the economy's stocks of labor, capital, and natural resources, and on the level of technology.

An increase in ***P*** does not affect any of these, so it does not affect Y_N.

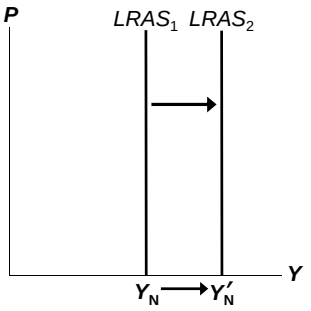
(Classical dichotomy)



Why the *LRAS* Curve Might Shift

Any event that changes any of the determinants of Y_N will shift *LRAS*.

Example: Immigration increases ***L***, causing Y_N to rise.



Why the *LRAS* Curve Might Shift

- Changes in ***L*** or natural rate of unemployment
  - Immigration
  - Baby-boomers retire
  - Govt policies reduce natural u-rate
- Changes in ***K*** or ***H***
  - Investment in factories, equipment
  - More people get college degrees
  - Factories destroyed by a hurricane

Why the *LRAS* Curve Might Shift

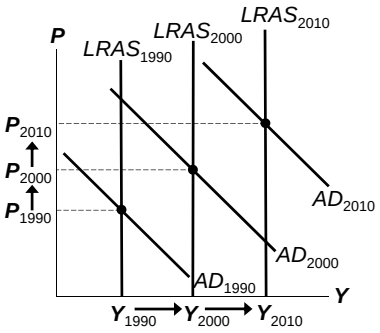
- Changes in natural resources
  - Discovery of new mineral deposits
  - Reduction in supply of imported oil
  - Changing weather patterns that affect agricultural production
- Changes in technology
  - Productivity improvements from technological progress

Using *AD* & *AS* to Depict Long-Run Growth and Inflation

Over the long run, tech. progress shifts *LRAS* to the right

and growth in the money supply shifts *AD* to the right.

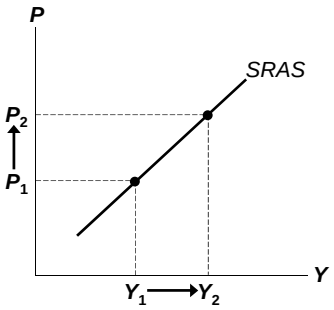
Result: ongoing inflation and growth in output.



Short Run Aggregate Supply (*SRAS*)

The *SRAS* curve is upward sloping:

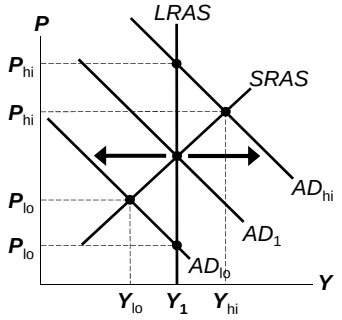
Over the period of 1–2 years, an increase in ***P*** causes an increase in the quantity of g & s supplied.



Why the Slope of *SRAS* Matters

If *AS* is vertical, fluctuations in *AD* do not cause fluctuations in output or employment.

If *AS* slopes up, then shifts in *AD* do affect output and employment.



Three Theories of *SRAS*

In each,

- some type of market imperfection
- result:
  Output deviates from its natural rate when the actual price level deviates from the price level people expected.

1. The Sticky-Wage Theory

- Imperfection:
  Nominal wages are **sticky** in the short run, they adjust sluggishly.
  - Due to labor contracts, social norms
- Firms and workers set the nominal wage in advance based on $\boldsymbol{P_E}$, the price level they expect to prevail.

1. The Sticky-Wage Theory

- If $\boldsymbol{P} > \boldsymbol{P_E}$,
  revenue is higher, but labor cost is not.
  Production is more profitable,
  so firms increase output and employment.
- Hence, higher ***P*** causes higher ***Y***,
  so the ***SRAS curve slopes upward***.

2. The Sticky-Price Theory

- Imperfection:
  Many prices are sticky in the short run.
  - Due to **menu costs**, the costs of adjusting prices.
  - Examples: cost of printing new menus, the time required to change price tags
- Firms set sticky prices in advance based on P_E.

2. The Sticky-Price Theory

- Suppose the Fed increases the money supply unexpectedly. In the long run, ***P*** will rise.
- In the short run, firms without menu costs can raise their prices immediately.
- Firms with menu costs wait to raise prices. Meanwhile, their prices are relatively low, which increases demand for their products, so they increase output and employment.
- Hence, higher ***P*** is associated with higher ***Y***, so the ***SRAS curve slopes upward***.

3. The Misperceptions Theory

- Imperfection:
  Firms may confuse changes in ***P*** with changes in the relative price of the products they sell.
- If ***P*** rises above P_E, a firm sees its price rise before realizing all prices are rising.
  The firm may believe its *relative* price is rising, and may increase output and employment.
- So, an increase in ***P*** can cause an increase in ***Y***, making the ***SRAS curve upward-sloping.***

What the 3 Theories Have in Common:

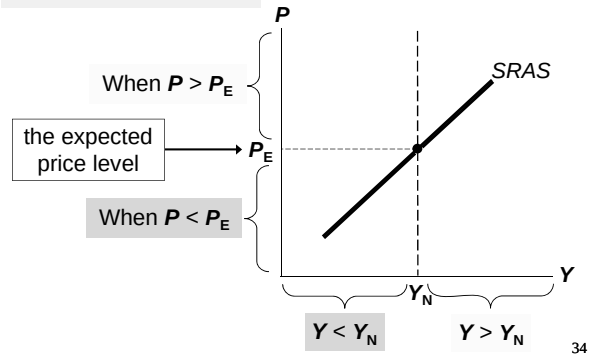
In all 3 theories, ***Y*** deviates from Y_N when ***P*** deviates from P_E.

$$Y = Y_N + \alpha(P - P_E)$$

- Output
- Natural rate of output (long-run)
- $\alpha > 0$, measures how much ***Y*** responds to unexpected changes in ***P***
- Actual price level
- Expected price level

What the 3 Theories Have in Common:

$$Y = Y_N + \alpha(P - P_E)$$



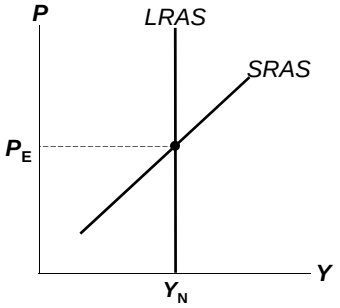
SRAS and *LRAS*

- The imperfections in these theories are temporary. Over time,
  - sticky wages and prices become flexible
  - misperceptions are corrected
- In the LR,
  - $P_E = P$
  - *AS* curve is vertical

SRAS and *LRAS*

$$Y = Y_N + \alpha(P - P_E)$$

In the long run,
$P_E = P$
and
$Y = Y_N$.



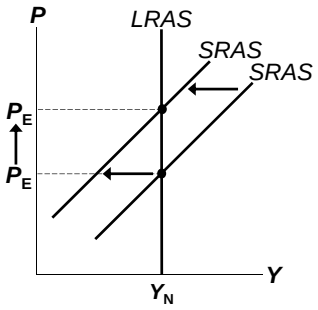
Why the *SRAS* Curve Might Shift

Everything that shifts *LRAS* shifts *SRAS*, too.

Also, P_E shifts *SRAS*:

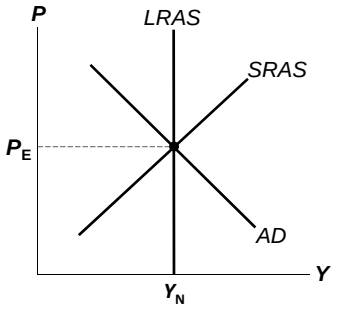
If P_E rises, workers & firms set higher wages.

At each P, production is less profitable, Y falls, *SRAS* shifts left.



The Long-Run Equilibrium

In the long-run equilibrium,
$P_E = P$,
$Y = Y_N$,
and unemployment is at its natural rate.



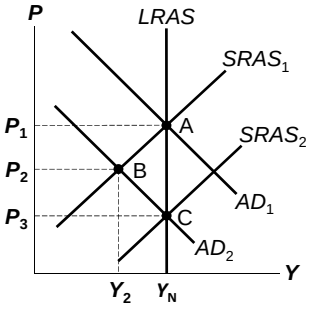
Economic Fluctuations

- Caused by events that shift the *AD* and/or *AS* curves.
- Four steps to analyzing economic fluctuations:
  1. Determine whether the event shifts *AD* or *AS*.
  2. Determine whether curve shifts left or right.
  3. Use *AD–AS* diagram to see how the shift changes Y and P in the short run.
  4. Use *AD–AS* diagram to see how economy moves from new SR eq'm to new LR eq'm.

The Effects of a Shift in *AD*

Event: Stock market crash

1. Affects C, *AD* curve
2. C falls, so *AD* shifts left
3. SR eq'm at B. P and Y lower, unemp higher
4. Over time, P_E falls, *SRAS* shifts right, until LR eq'm at C. Y and unemp back at initial levels.

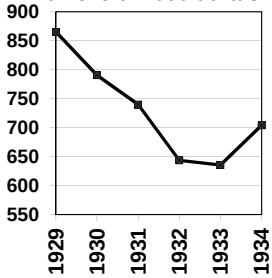


Two Big *AD* Shifts:
1. The Great Depression

From 1929–1933,

- money supply fell 28% due to problems in banking system
- stock prices fell 90%, reducing C and I
- Y fell 27%
- P fell 22%
- u-rate rose from 3% to 25%

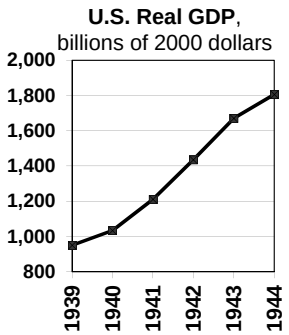
U.S. Real GDP, billions of 2000 dollars



Two Big *AD* Shifts:
2. The World War II Boom

From 1939–1944,

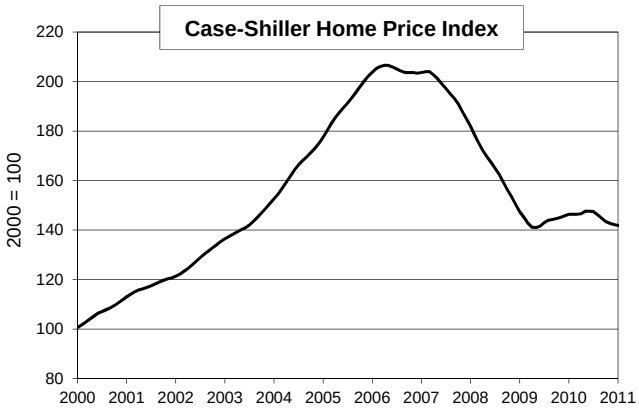
- govt outlays rose from $9.1 billion to $91.3 billion
- ***Y*** rose 90%
- ***P*** rose 20%
- unemp fell from 17% to 1%



CASE STUDY:
The 2008–2009 Recession

- From 12/2007 to 6/2009, real GDP fell 4.7%
- Unemployment rose from 4.4% in 5/2007 to 10.0% in 10/2009
- The housing market played a central role in this recession…

CASE STUDY:
The 2008–2009 Recession



CASE STUDY:
The 2008–2009 Recession

Rising house prices during 2002–2006 due to:

- low interest rates
- easier credit for "sub-prime" borrowers
- government policies to increase homeownership
- securitization of mortgages:
  - Investment banks purchased mortgages from lenders, created securities backed by these mortgages, sold the securities to banks, insurance companies, and other investors.
  - Mortgage-backed securities perceived as safe, since house prices "never fall."

CASE STUDY:
The 2008–2009 Recession

Consequences of 2006–2009 housing market crash:

- Millions of homeowners "underwater"—owed more than house was worth.
- Millions of mortgage defaults and foreclosures.
- Banks selling foreclosed houses increased surplus and downward price pressures.
- Housing crash badly damaged construction industry: 2010 unemployment rate was 20.6% in construction vs. 9.6% overall.

CASE STUDY:
The 2008–2009 Recession

Consequences of 2006–2009 housing market crash:

- Mortgage-backed securities became "toxic," heavy losses for institutions that purchased them, widespread failures of banks and other financial institutions.
- Sharply rising unemployment and falling GDP.

CASE STUDY:

The 2008–2009 Recession

The policy response:

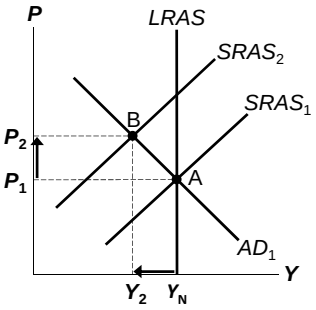
- Federal Reserve reduced Fed Funds rate target to near zero.
- Federal Reserve purchased mortgage-backed securities and other private loans.
- U.S. Treasury injected capital into the banking system to increase banks' liquidity and solvency in hopes of staving off a "credit crunch."
- Fiscal policymakers increased government spending and reduced taxes by $800 billion.

The Effects of a Shift in *SRAS*

Event: Oil prices rise

1. Increases costs, shifts *SRAS* *(assume LRAS constant)*
2. *SRAS* shifts left
3. SR eq'm at point B. ***P*** higher, ***Y*** lower, unemp higher

From A to B, **stagflation**, a period of falling output and rising prices.

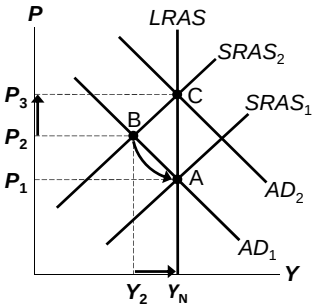


Accommodating an Adverse Shift in *SRAS*

If policymakers do nothing,

4. Low employment causes wages to fall, *SRAS* shifts right, until LR eq'm at A.

Or, policymakers could use fiscal or monetary policy to increase *AD* and accommodate the *AS* shift:
Y back to Y_N, but
P permanently higher.



The 1970s Oil Shocks and Their Effects

	1973–75	1978–80
Real oil prices	+ 138%	+ 99%
CPI	+ 21%	+ 26%
Real GDP	– 0.7%	+ 2.9%
# of unemployed persons	+ 3.5 million	+ 1.4 million

John Maynard Keynes, 1883–1946

- *The General Theory of Employment, Interest, and Money*, 1936
- Argued recessions and depressions can result from inadequate demand; policymakers should shift *AD*.
- Famous critique of classical theory: *The long run is a misleading guide to current affairs. In the long run, we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us when the storm is long past, the ocean will be flat.*

CONCLUSION

- This chapter has introduced the model of aggregate demand and aggregate supply, which helps explain economic fluctuations.
- Keep in mind: these fluctuations are deviations from the long-run trends explained by the models we learned in previous chapters.
- In the next chapter, we will learn how policymakers can affect aggregate demand with fiscal and monetary policy.