Economics 2 | Professor Christina Romer
Spring 2020 | Professor David Romer

LECTURE 20
PLANNED AGGREGATE EXPENDITURE AND OUTPUT
April 9, 2020

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Lecture 20

Planned Aggregate Expenditure and Output

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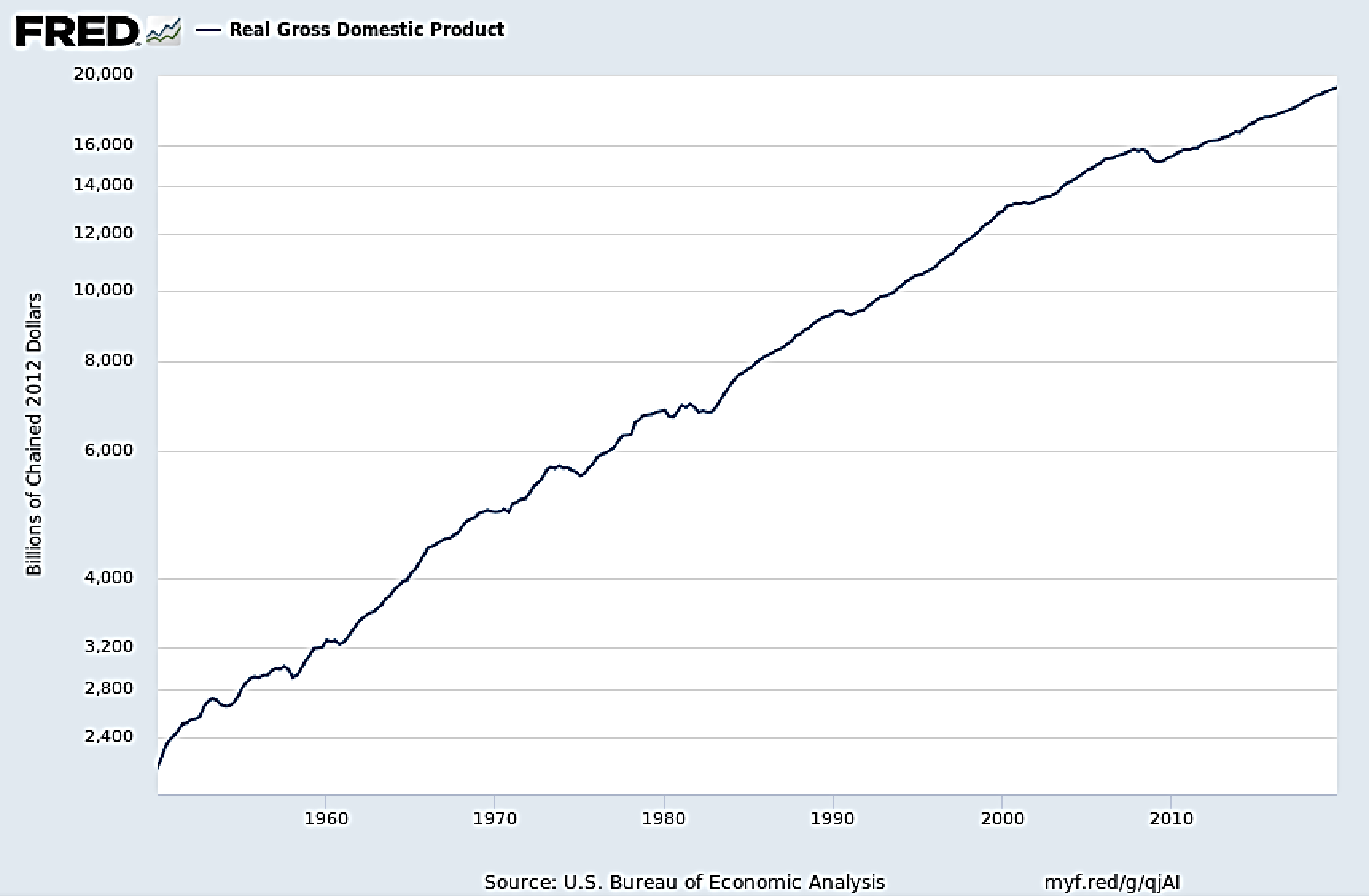
Announcements

- We have posted a revised syllabus on the course website.
    - Weekly problem sets and a change in lecture schedule.
- We have posted Problem Set 5, Part 1.
    - It is due at 2 p.m. on Thursday, April 16th.
- Research paper reading for next time.
    - Romer and Romer, "The Macroeconomic Effects of Tax Changes."

I. Overview of Short-Run Fluctuations

Real GDP in the United States, 1950–2019

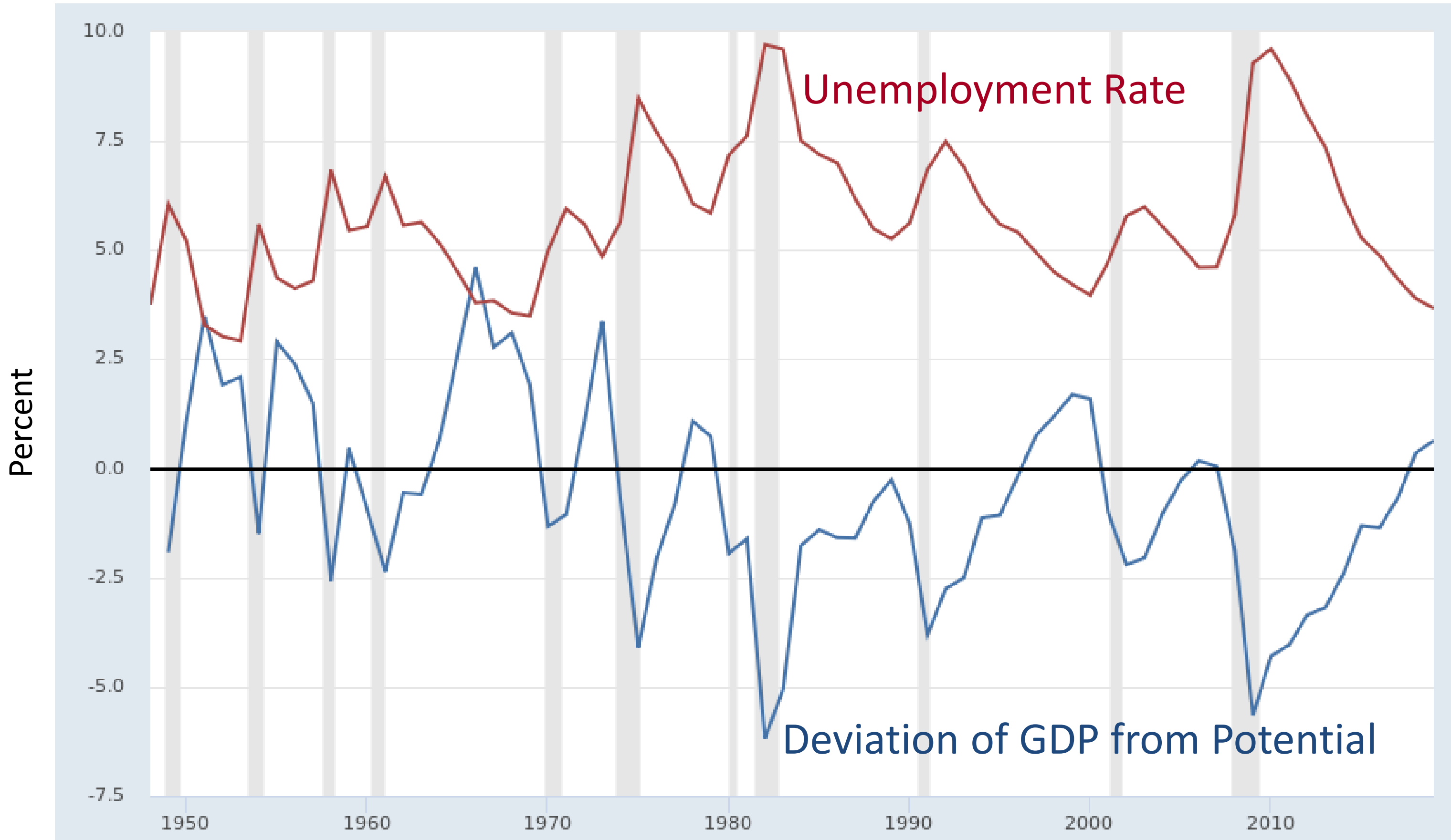


Source: FRED (Federal Reserve Economic Data); data from Bureau of Economic Analysis.

Short-Run Fluctuations

- Times when output moves above or below potential (booms and recessions).
- Recessions are costly and very painful to the people affected.

Deviation of GDP from Potential and the Unemployment Rate



Source: FRED; data from Bureau of Labor Statistics.

II. The Key Role of Demand

Key Determinant of Output in the Short Run

- In the long run, aggregate output is equal to potential output.
    - Potential output is determined by normal capital, labor, and technology.
- In the short run, aggregate output can be above, below, or equal to potential output.
    - Short-run output is determined primarily by demand.

Three Terms that Mean the Same Thing

- Planned aggregate expenditure.
- Planned spending.
- Planned aggregate demand.
- All three terms refer to the total amount that people in the economy plan to buy (or spend).
- In the short run, if planned aggregate expenditure changes, output changes.

Evidence on the Key Role of Demand

- Historical experience.
- Academic research.

Why is Output Determined by Demand in the Short Run?

- Nominal rigidity (inflation doesn’t change substantially in the short run).

- Due to limited information, menu costs, long-term contracts, or other factors.

III. Planned Aggregate Expenditure

Components of Planned Aggregate Expenditure (PAE)

- Consumption (C)
- Planned investment (I^p)
- Government purchases (G)
- Net exports (NX)

$$PAE = C + I^p + G + NX$$

Short Run versus Long Run

- In the short run:
  - PAE can be more than, less than, or equal to Y*.
  - Output responds to match PAE.
- In the long run:
  - Output is at Y* (determined by normal technology, capital, and employment).
  - PAE adjusts to equal Y*.
  - Movement in r brings this about.

IV. Determinants of Each Component of PAE

Determinants of Planned Investment (I^p)

- Real interest rate (r).
- Expectations ("animal spirits").
- We talk about "planned investment" because we are leaving out the unplanned investment in inventories that happens when PAE is different from actual output.

Determinants of Government Purchases (G)

- Politics.
- Wars, natural disasters.
- We take G as given.

Determinants of Net Exports (NX)

- For now we are assuming they are just given.
- Will discuss the economic determinants later in the course.

Determinants of Consumption (C)

- Real interest rate (r): A rise in the real interest rate reduces consumption.
- Expectations ("consumer confidence")
- Wealth: A rise in wealth increases consumption.
- Disposable (or after-tax) income: A rise in disposable income increases.

Consumption and Disposable Income

- Aggregate income: Same as aggregate output (Y)
- Aggregate tax payments: Same as government tax revenues (T)
- Aggregate disposable income: Y–T
- Consumption function: $C = f(Y - T)$
- Sometimes written in the particular form:

$$C = \bar{C} + c \cdot (Y - T)$$

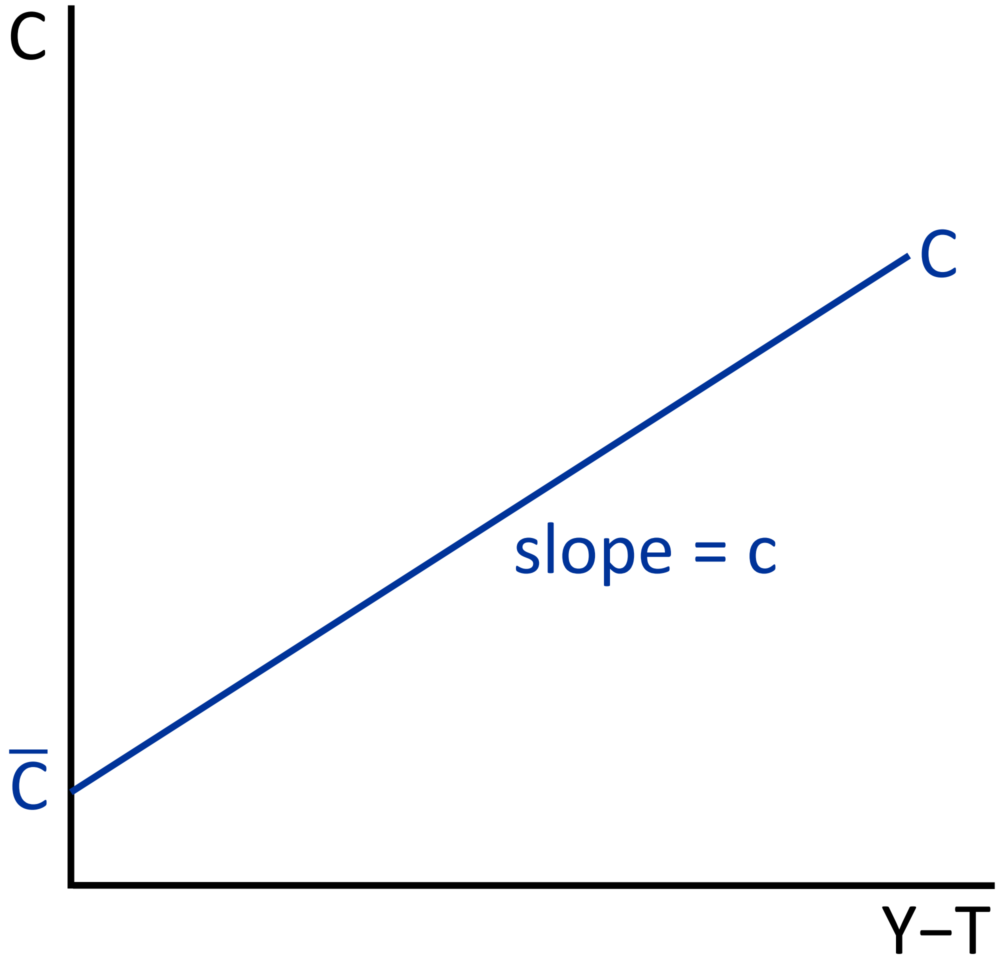
Consumption Function

$$C = \bar{C} + c \cdot (Y - T)$$

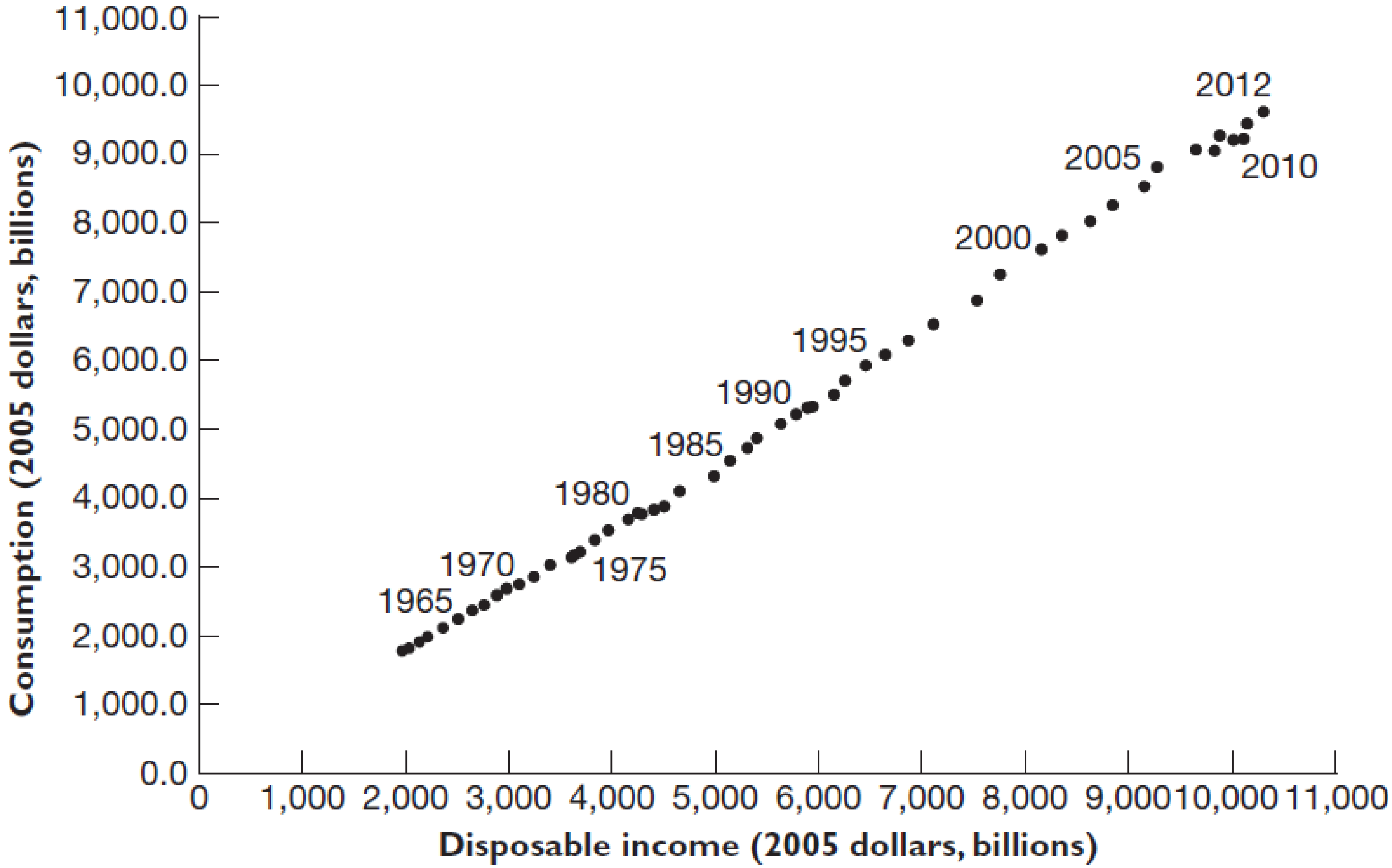
- Autonomous consumption: The part of consumption that does not vary with income ($\bar{C}$). It is positive.
- Marginal propensity to consume (MPC): The change in consumption due to a change in disposable income (c). It is between 0 and 1.

Consumption Function

$$C = \bar{C} + c \cdot (Y - T)$$



Consumption and Disposable Income



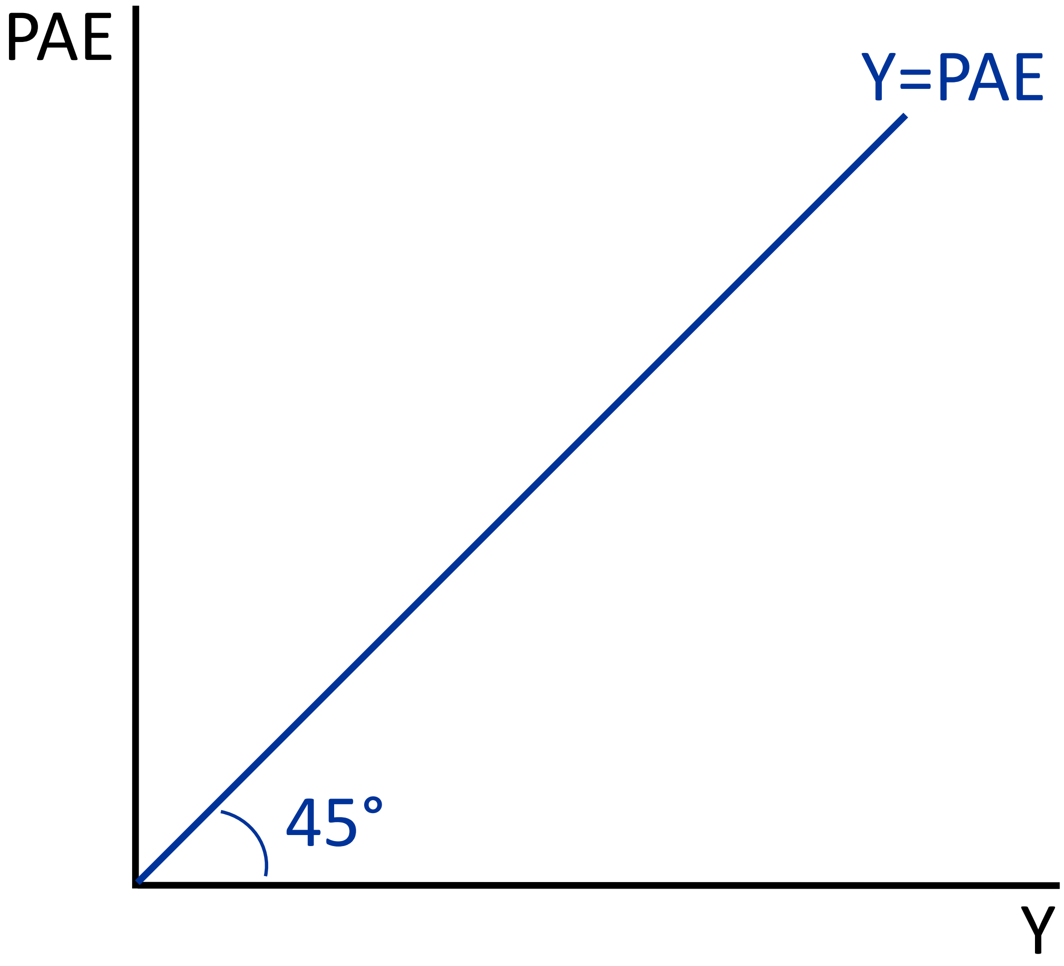
Source: Frank, Bernanke, Antonovics, and Heffetz, "Principles of Economics."

V. Determination of Output in the Short Run

45-degree Line

- Captures the equilibrium condition that Y = PAE.
- Also reflects the empirical reality that output responds to planned spending in the short run.

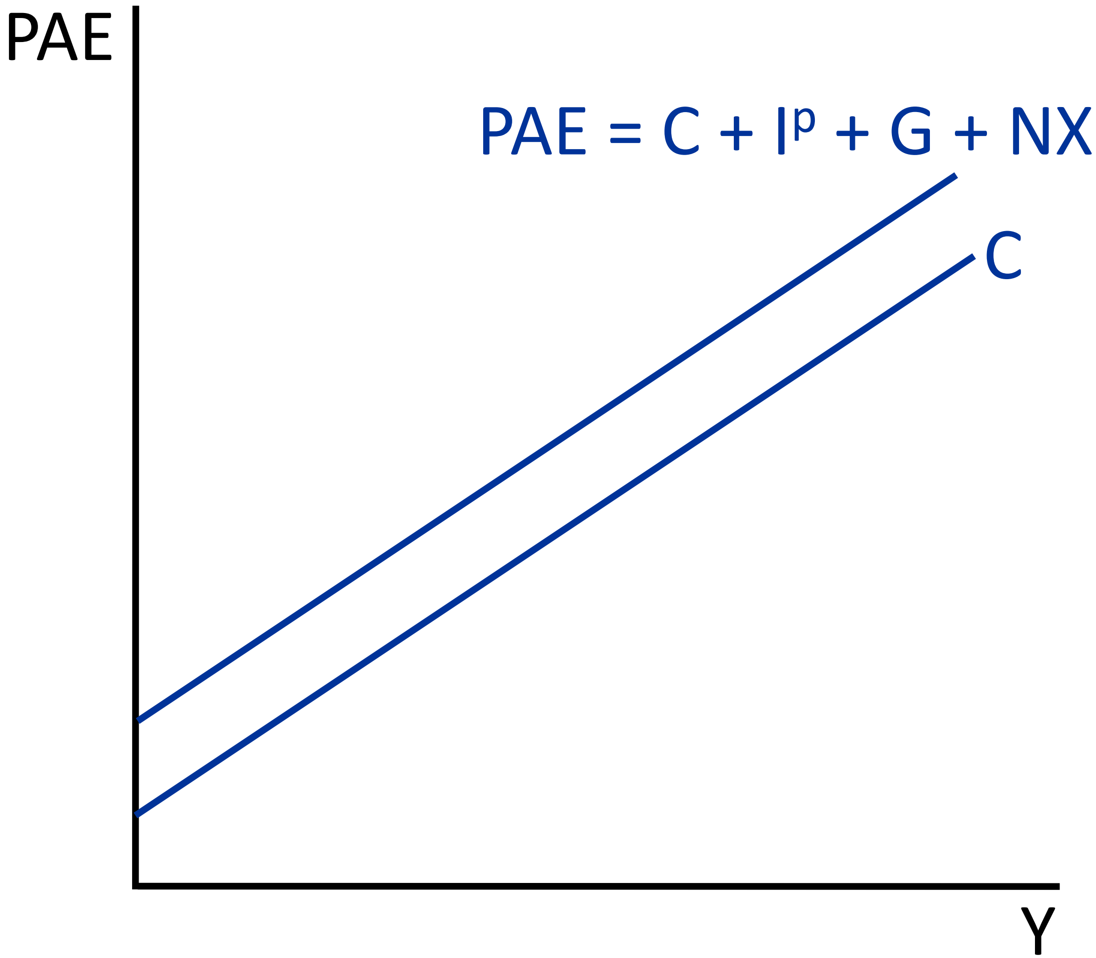
45-degree Line



Expenditure Line

- Captures the fact that planned aggregate spending is a function of total income (which is the same as total output).
- Recall that PAE = C + I^p + G + NX.
- PAE is a function of Y because one component (Consumption) depends on Y.
- The sensitivity of PAE to Y is the same as the sensitivity of C to Y (it is the MPC).

Expenditure Line

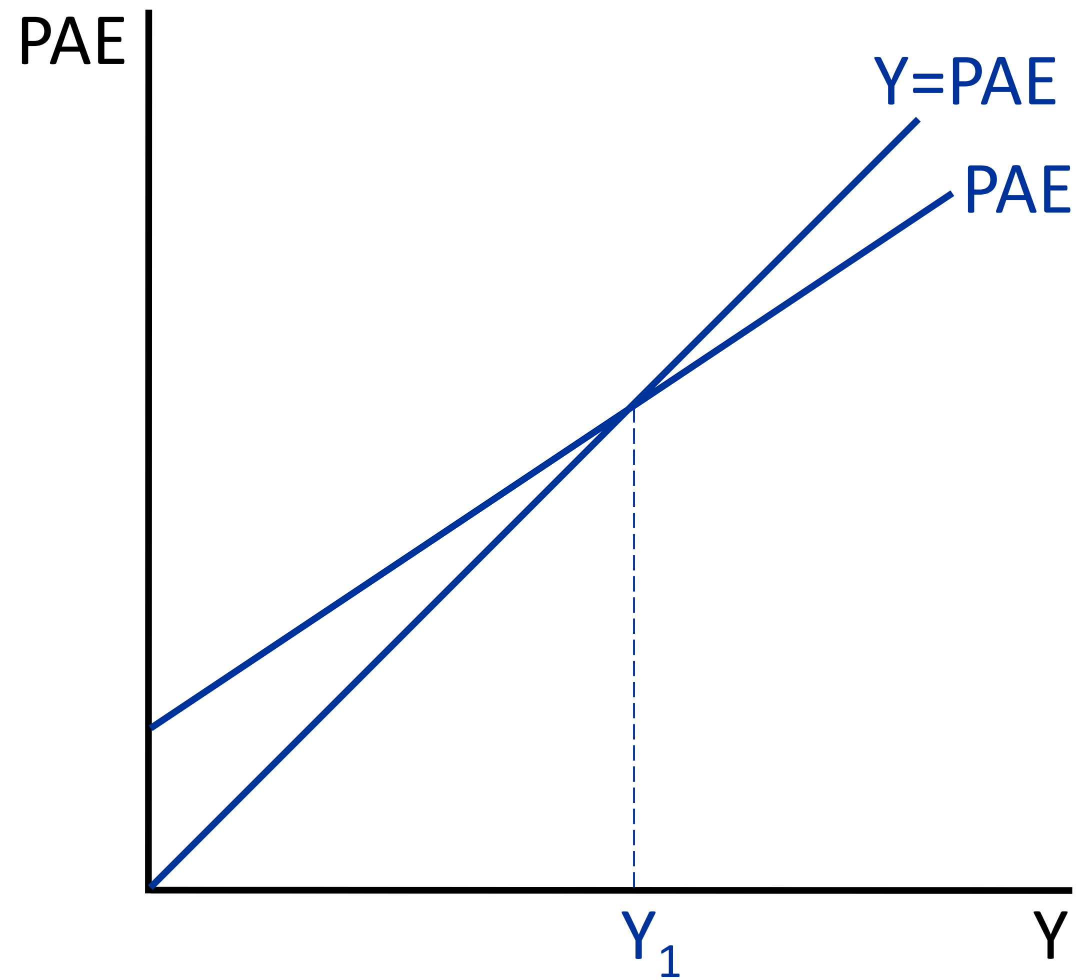


The slope of the expenditure line (PAE) is the MPC.

Determination of Output in the Short Run

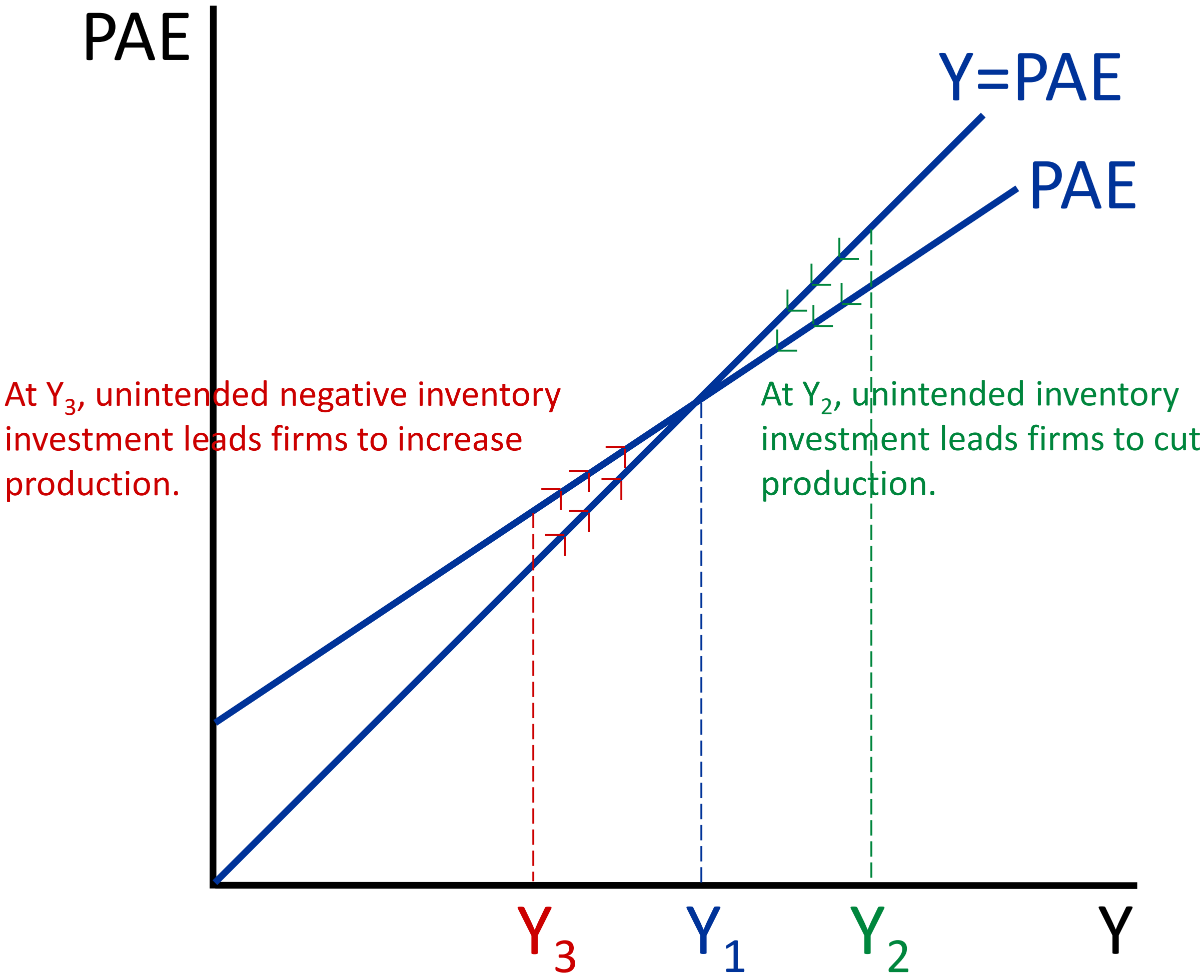
- Output in the short run is determined by the intersection of the 45-degree line and the expenditure line.

Determination of Short-Run Output

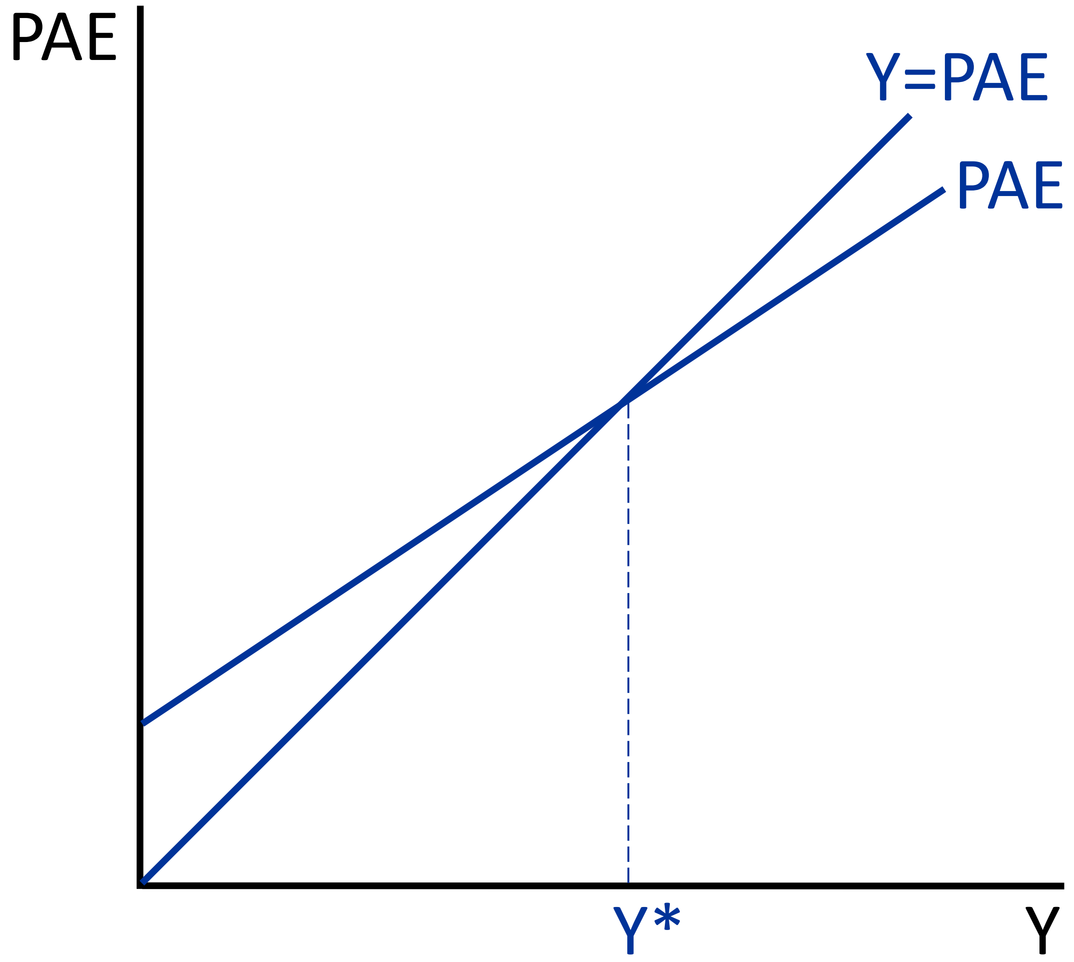


Sometimes called the “Keynesian Cross” diagram.

How does the economy get to short-run equilibrium?



Long-Run Equilibrium



In the long run, PAE=Y and PAE cross at Y* (potential output).

VI. Shifts in the Expenditure Line

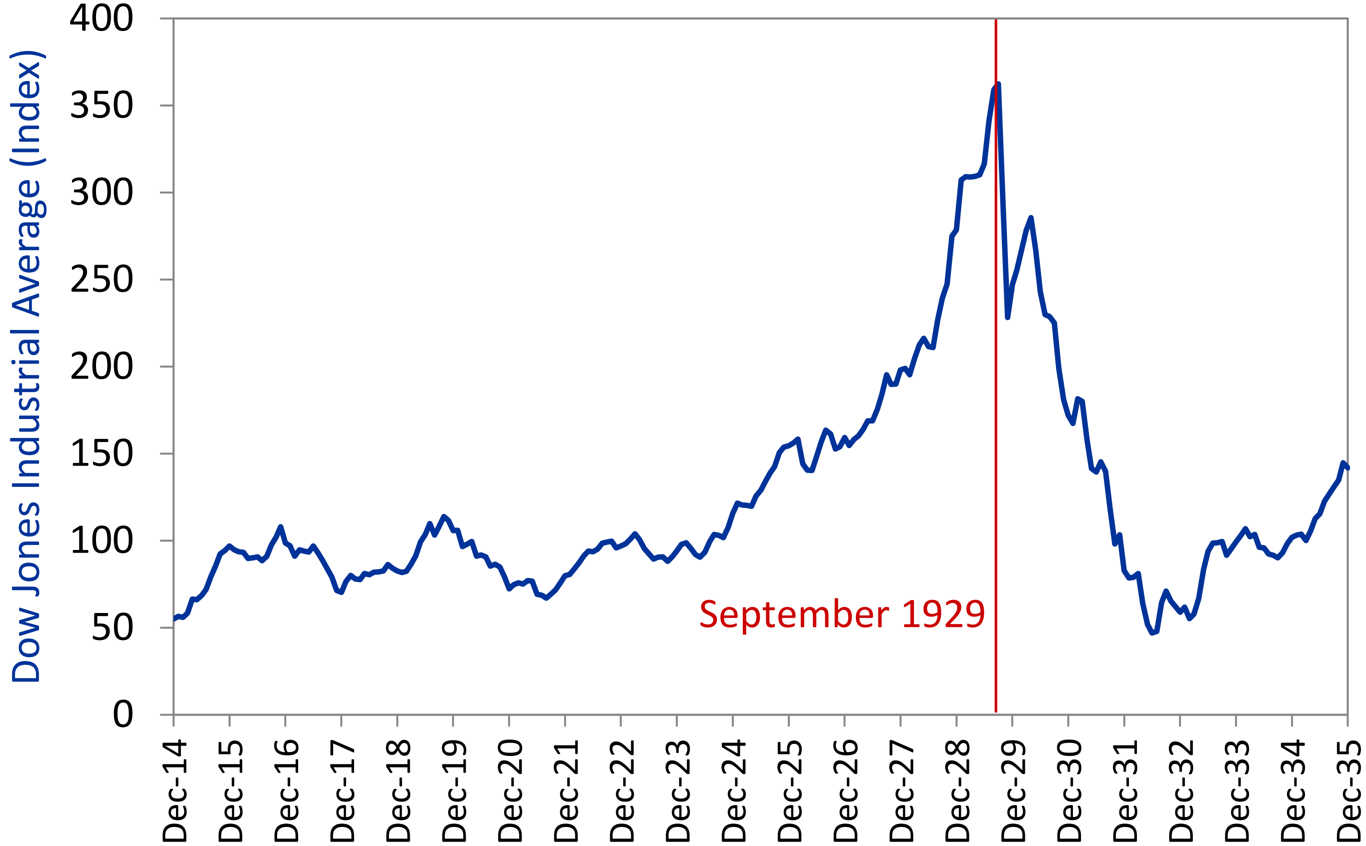
Crucial Determinant of Short-Run Fluctuations: Shifts in the Expenditure Line

- Expenditure line (PAE) shows how planned spending varies with output.
- Anything that changes planned spending ***other*** than output, will shift the curve.
- If the expenditure line shifts, short-run equilibrium output will change.

Example: A Fall in Autonomous Consumption

- A fall in consumption ***not*** caused by a fall in output.
- A decline in the intercept of the consumption function ($\bar{C}$).
- It reduces planned aggregate expenditure at a given level of Y.

Great Crash of the Stock Market in October 1929



Source: Federal Reserve Bank of St. Louis, FRED.

Why Might a Fall in Stock Prices Reduce Consumer Spending (at a Given Level of Output)?

- Reduction in wealth makes consumers feel poorer.
- Fall in stock prices makes consumers pessimistic (lowers consumer confidence).
- Stock price volatility causes uncertainty and leads to “wait and see” behavior.

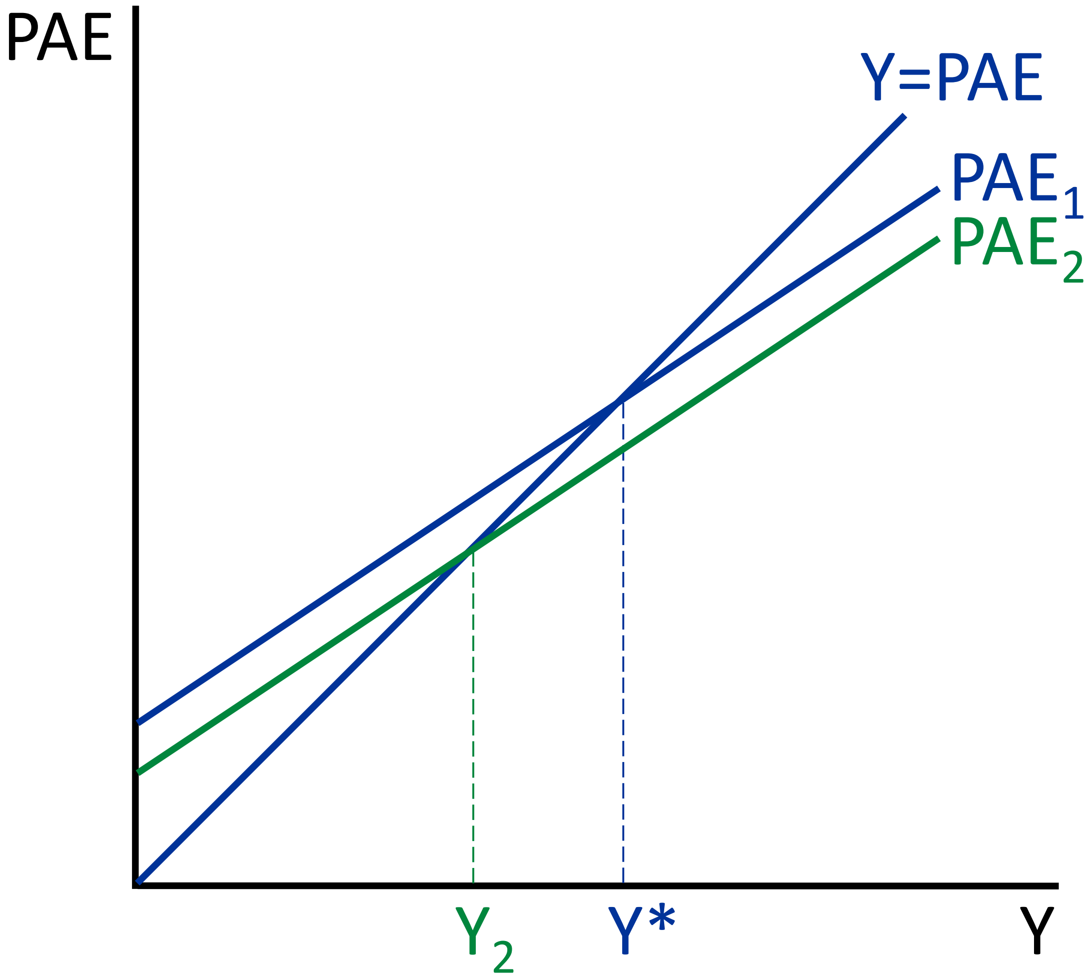
The Collapse of Consumer Spending in Late 1929

TABLE I
CONSUMER BEHAVIOR FOLLOWING THE GREAT CRASH

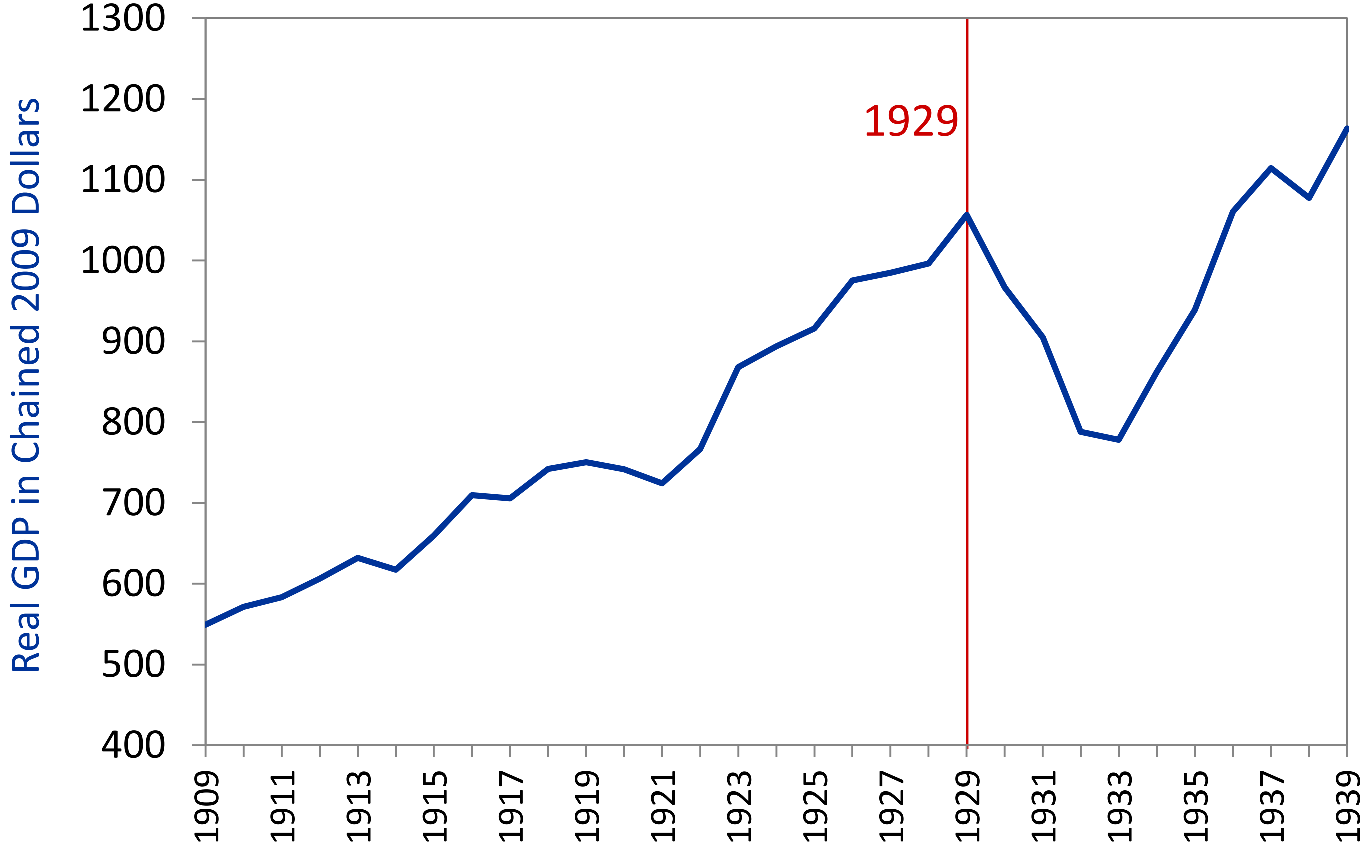
	Cumulative percentage change in real seasonally adjusted retail sales					
	Oct. 1929	Nov. 1929	Dec. 1929	Jan. 1930	Feb. 1930	Mar. 1930
Automobile registrations	−5.5	−14.1	−18.9	−23.7	−11.7	−20.4
Department store sales	−8.4	−10.1	−4.5	−15.8	−11.7	−16.4
Mail-order sales	−4.1	−7.4	3.4	−20.6	−25.6	−35.8
Ten-cent store sales	−0.3	1.7	−2.5	−2.7	−0.1	−7.4
Grocery store sales	5.9	3.1	3.4	NA	NA	NA

Source: Christina Romer, “The Great Crash and the Onset of the Great Depression.”

A Fall in Autonomous Consumption

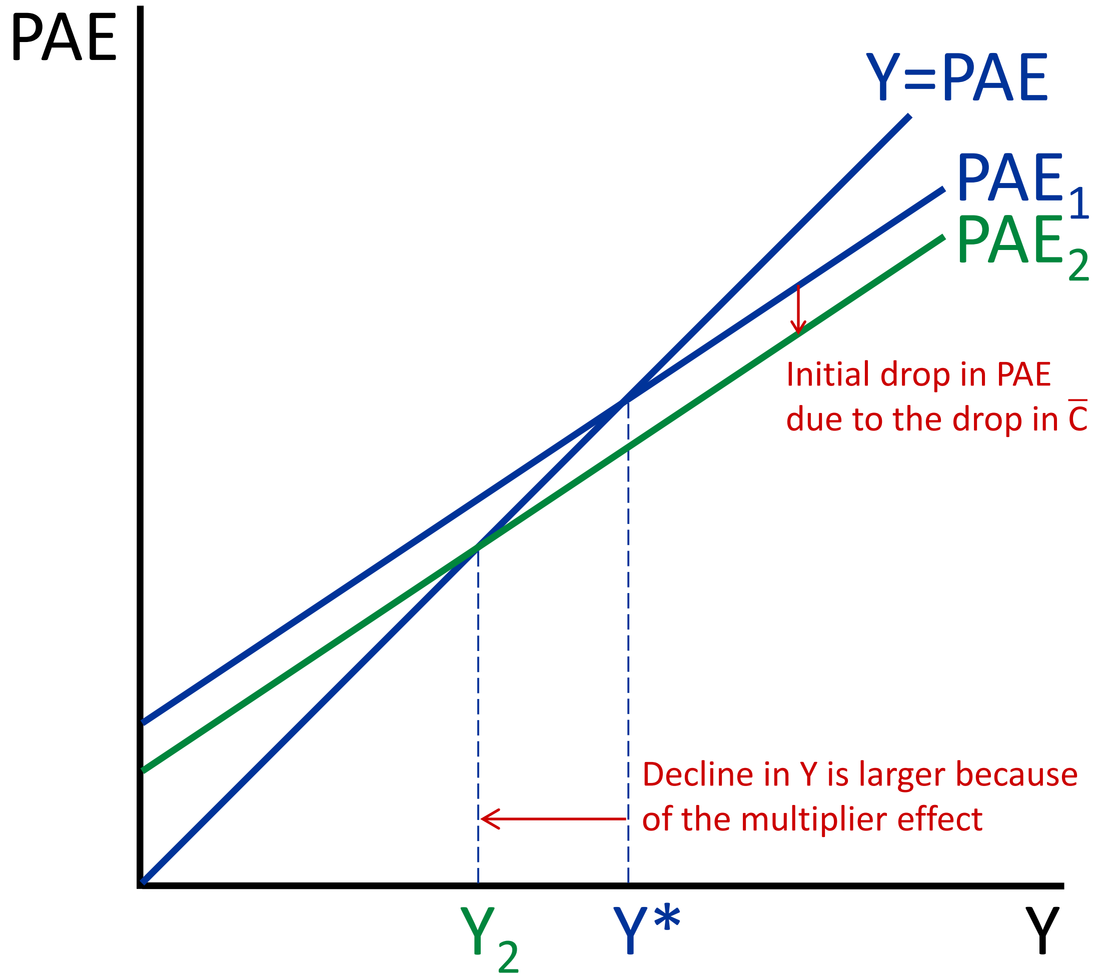


Real GDP, 1909–1939



Source: Christina Romer, “The Prewar Business Cycle Reconsidered,” and BEA.

The Multiplier Effect



The initial drop in PAE is magnified by the fact that as Y declines, C declines further.

Multiplier Effect

- A change in PAE changes output by more than the initial change in PAE.
- Why? Because changes in output affect consumer spending and reinforce (or multiply) the initial change in PAE.
- Existence of the multiplier effect explains why moderate changes in planned spending cause more substantial changes in output.