Economics 2
Spring 2020

Professor Christina Romer
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LECTURE 21

FISCAL POLICY

April 14, 2020

I. REVIEW OF THE KEYNESIAN CROSS DIAGRAM
   A. Determination of output in the short run
   B. What causes short-run fluctuations?
   C. Another example of a shift in the expenditure line: A rise in animal spirits
   D. Other factors that shift the expenditure line

II. FISCAL POLICY IN THEORY
   A. Definitions
   B. Example: A tax cut
      1. How does a tax cut affect PAE?
      2. Effects on output in the short run
   C. Countercyclical fiscal policy

III. EMPIRICAL EVIDENCE ON THE EFFECTS OF FISCAL POLICY: DISCUSSION OF THE ROMER AND ROMER PAPER
   A. The difficulty in estimating the effect of tax changes on output
   B. Romer and Romer's approach
   C. Empirical estimates of the macroeconomic effects of tax changes
   D. Evaluation

IV. CASE STUDY: THE 2008 RECESSION AND THE FISCAL POLICY RESPONSE
   A. Causes of the 2008 recession
   B. Issues in designing a fiscal stimulus program
   C. Estimates of the effect of the 2009 Recovery Act

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Announcements

- We have handed out Problem Set 5, Part 1.
    - It is due at 2 p.m. PDT on Thursday, April 16th.

I. Review of the Keynesian Cross Diagram

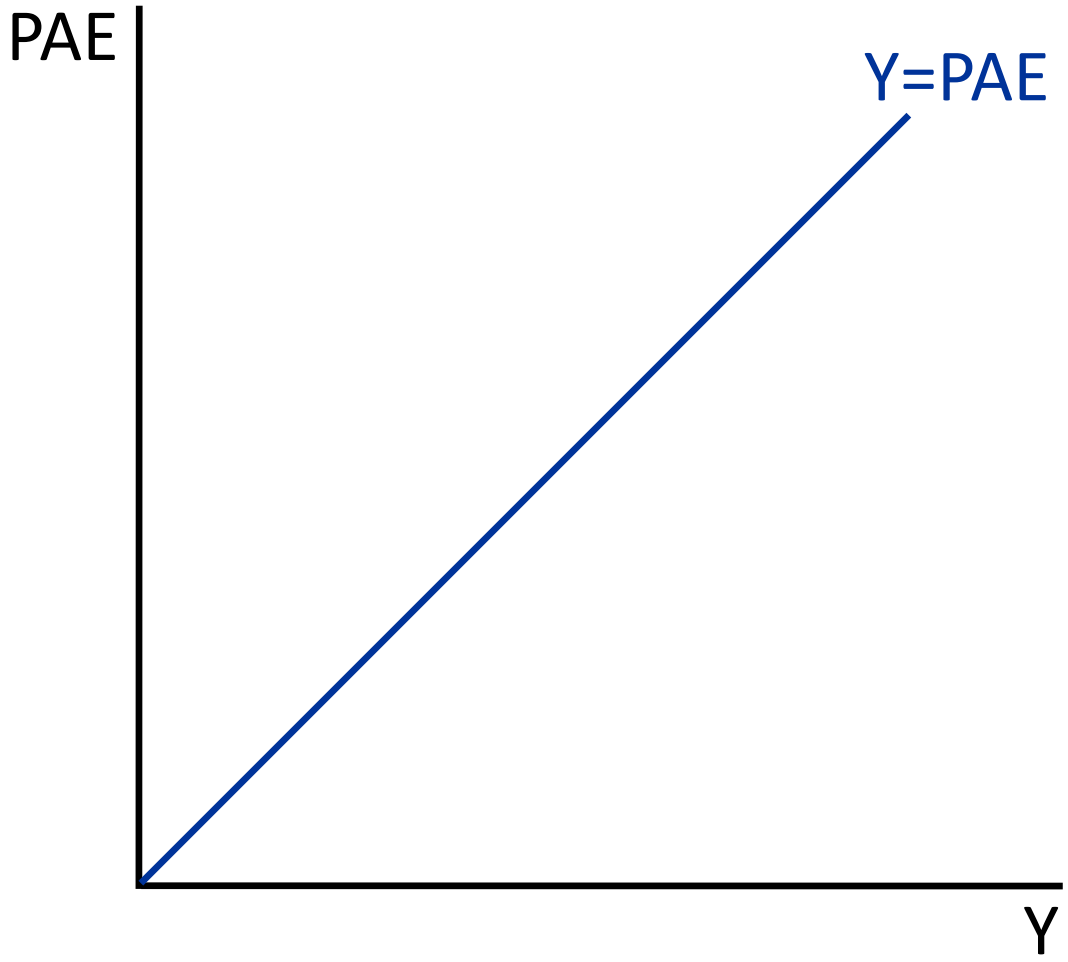
Determination of Short-Run Output

- Equilibrium condition:

$$Y = PAE$$

  - Y is output and PAE is planned aggregate expenditure.
  - Output responds to demand in the short run.
  - Referred to as the 45-degree line.

Determination of Short-Run Output



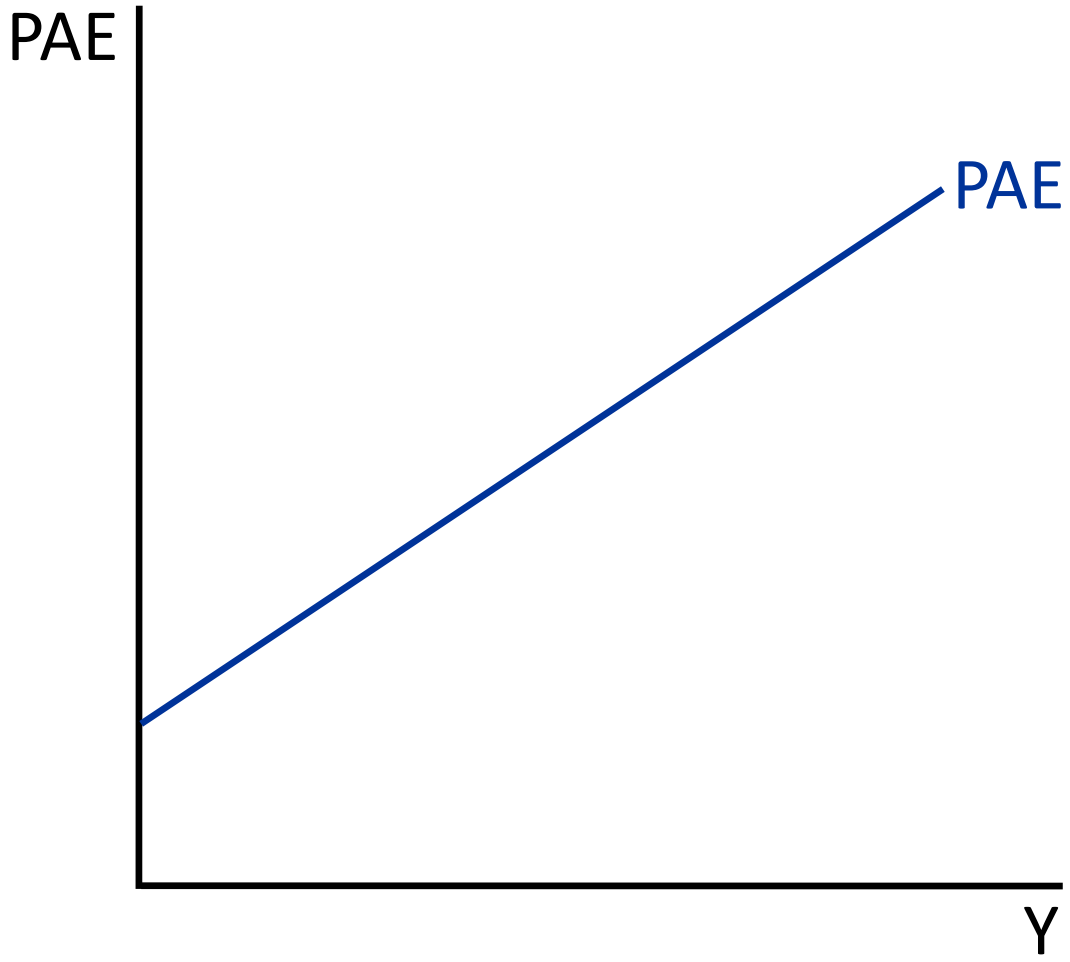
Determination of Short-Run Output (Continued)

- Planned spending is a function of output:

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

  - Where C depends on positively on Y, so PAE also depends positively on Y.
  - Referred to as the expenditure line.

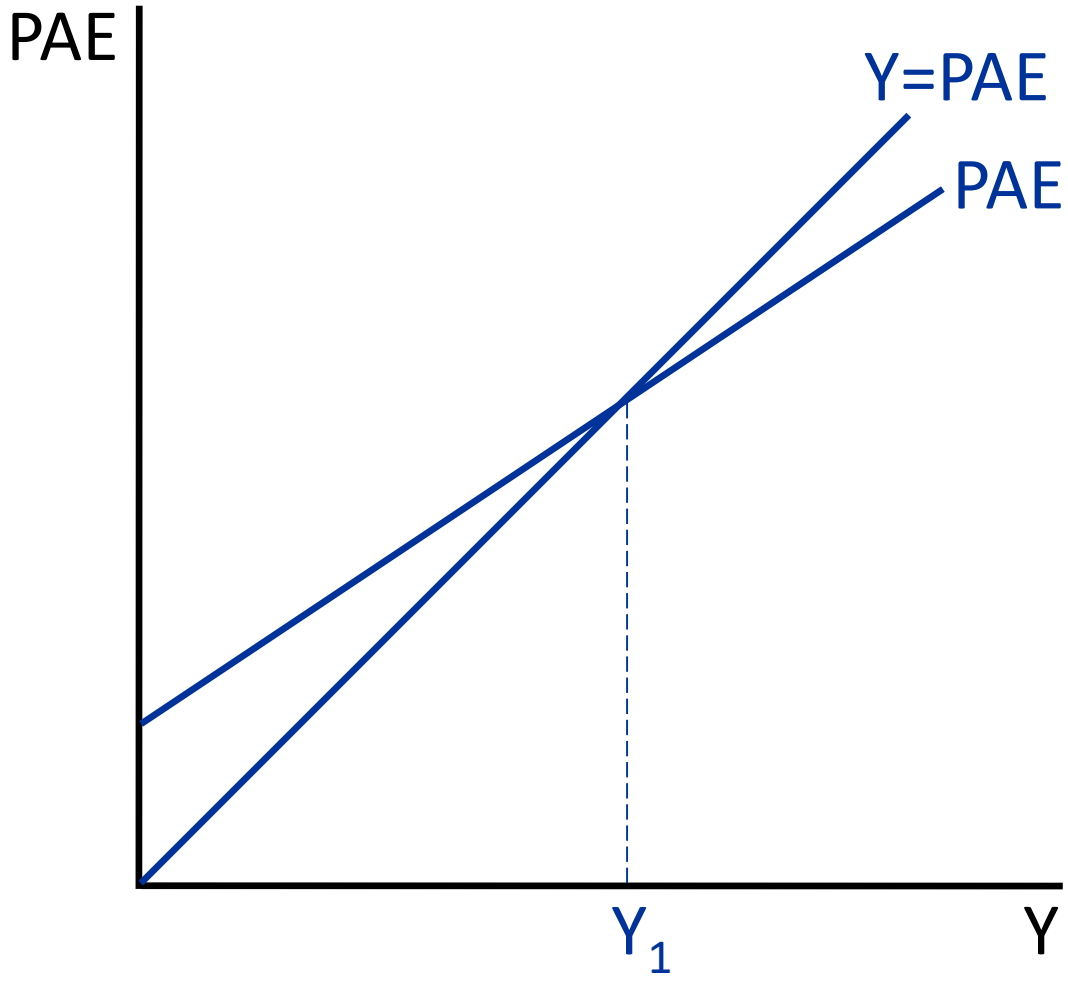
Determination of Short-Run Output



Determination of Short-Run Output (Continued)

- Short-run output 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.

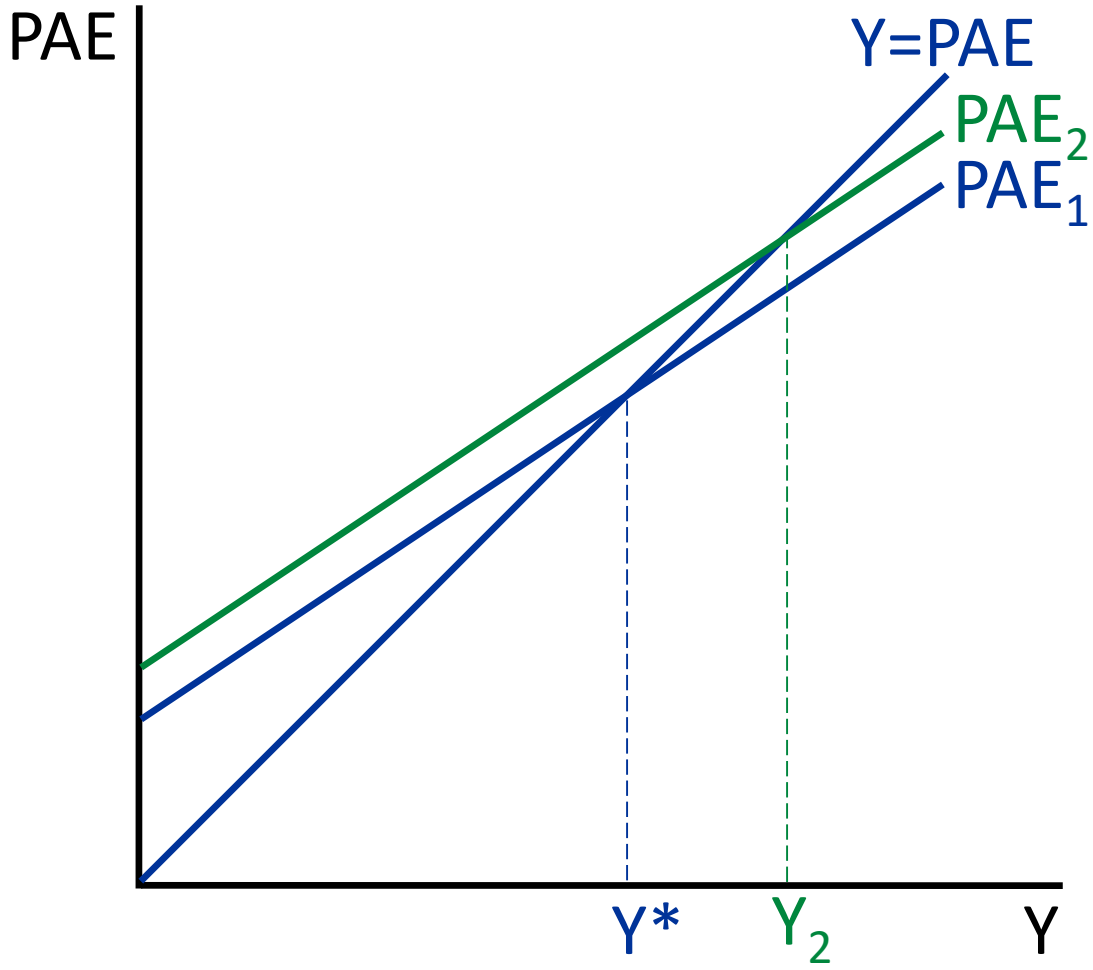
What Causes Short-Run Fluctuations?

- Anything that shifts the expenditure line will cause output to change in the short run.

Example: A Rise in Animal Spirits

- Suppose that something causes firms throughout the economy to raise their expectations of the future MRP_K.
- This will make firms want to do more investment.
- This will shift up the expenditure line.

A Rise in Animal Spirits



The rise in Y is larger than the initial increase in PAE because of the multiplier effect.

What Shifts the Expenditure Line?

- A change in autonomous consumption (consumer confidence, wealth, uncertainty).
- A change in firm's expectations of future MRP_K (animal spirits).
- A change in the real interest rate.
- A change in taxes or government purchases.
- A change in net exports.

Two Types of Macroeconomic Policy

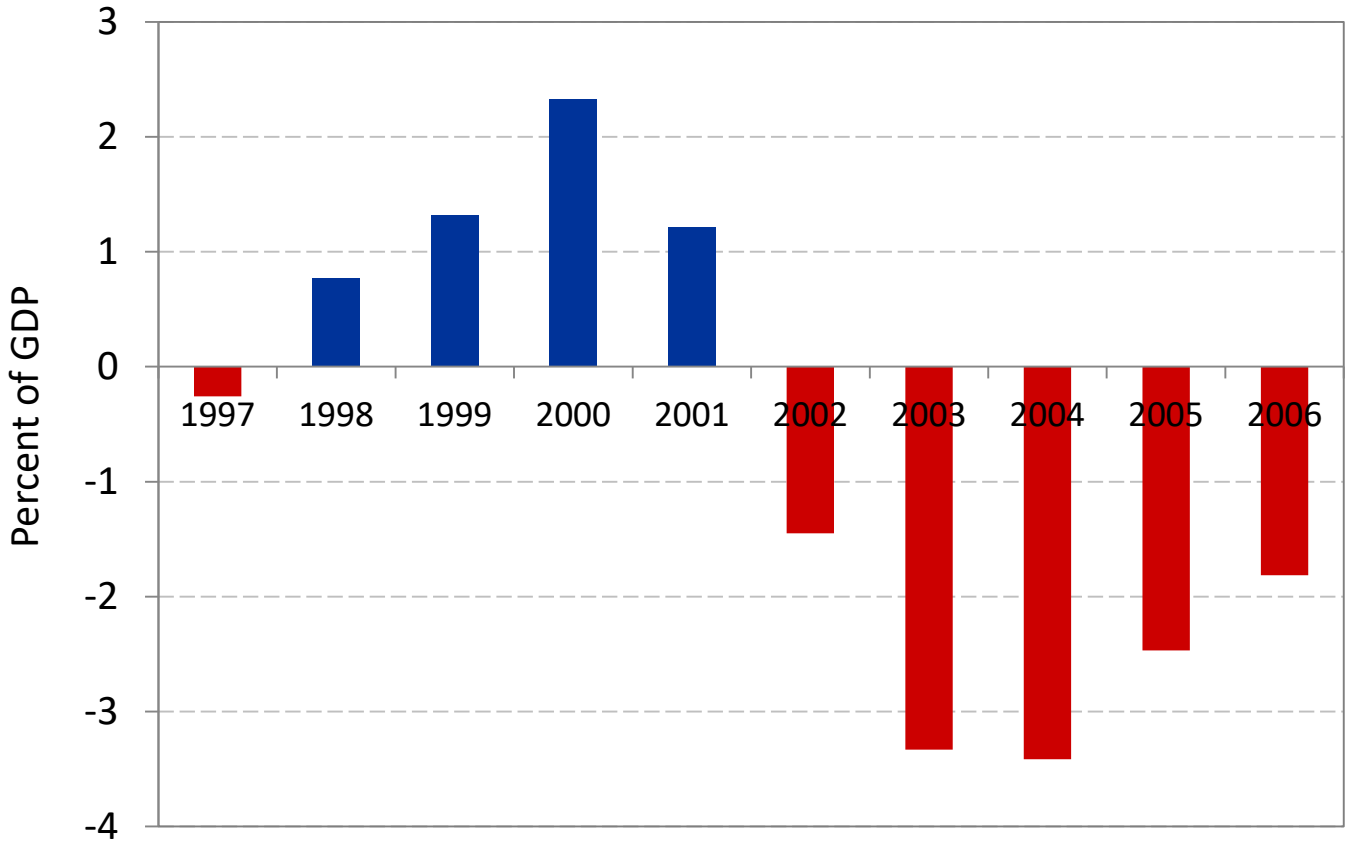
- Fiscal policy: Actions taken by the government to change the budget surplus.
- Monetary policy: Actions taken by the central bank to affect nominal and real interest rates.

II. Fiscal Policy in Theory

Fiscal Policy Terminology

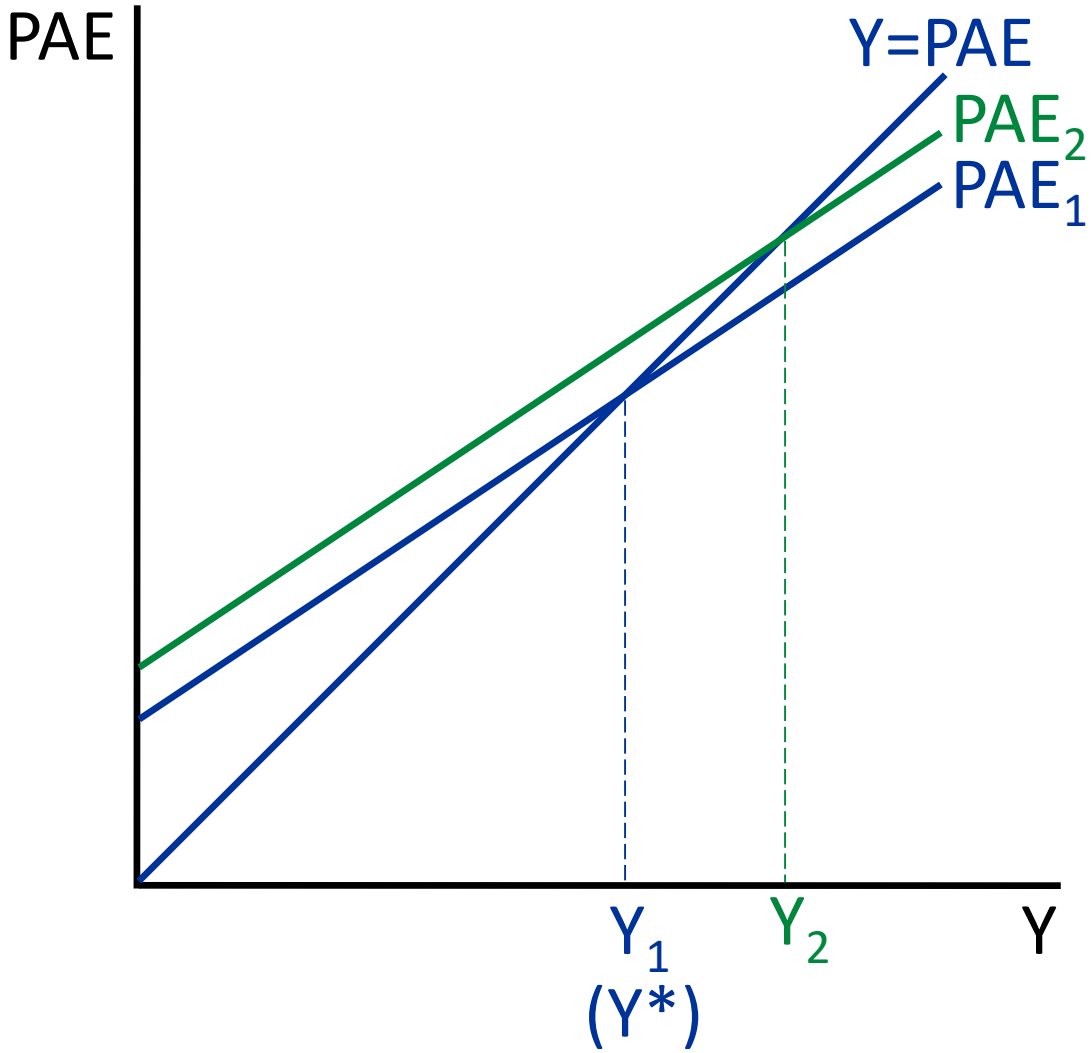
- Government budget surplus:
  - Tax revenues – Government purchases (T–G)
- Contractionary fiscal policy: Actions that increase the government budget surplus.
  - Will decrease PAE at a given level of Y.
- Expansionary fiscal policy: Actions that decrease the government budget surplus.
  - Will increase PAE at a given level of Y.

Federal Budget Surplus and the Bush Tax Cuts



Source: Congressional Budget Office.

Short-Run Effects of a Tax Cut



Substituting the Consumption Function into PAE

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

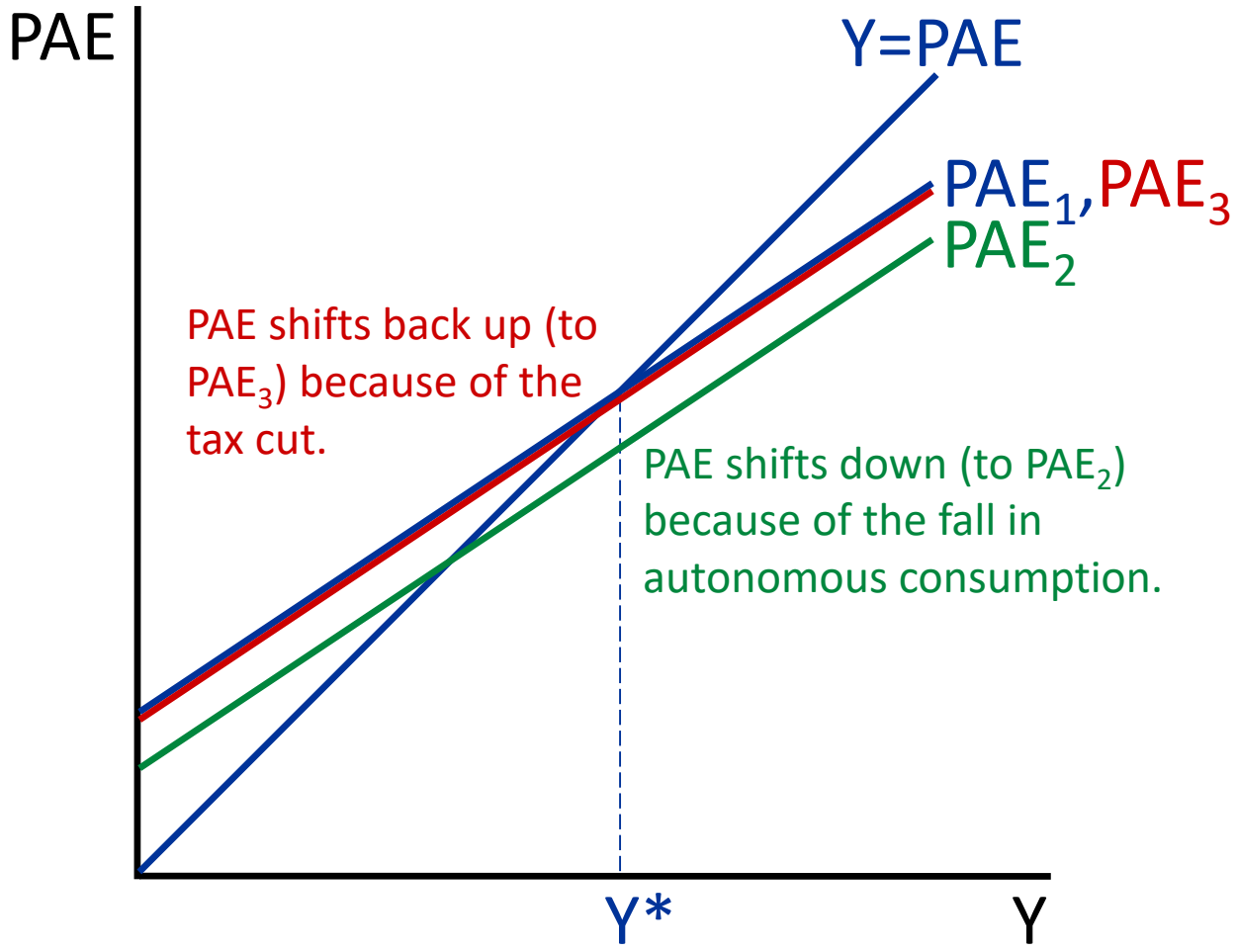
$$PAE = C + I^p + G + NX$$

$$= \bar{C} + c \cdot (Y - T) + I^p + G + NX$$

$$= \bar{C} + cY - cT + I^p + G + NX$$

$$= \underbrace{(\bar{C} - cT + I^p + G + NX)}_{\text{PAE Intercept Term}} + cY$$

Combining the Effects of a Fall in Autonomous Consumption and a Tax Cut



Countercyclical Fiscal Policy

- Deliberate changes in the budget surplus (through changes in taxes or government purchases) to try to counteract other factors likely to cause a short-run fluctuation.

III. Empirical Evidence on the Effects of Fiscal Policy: Discussion of the Romer and Romer Paper

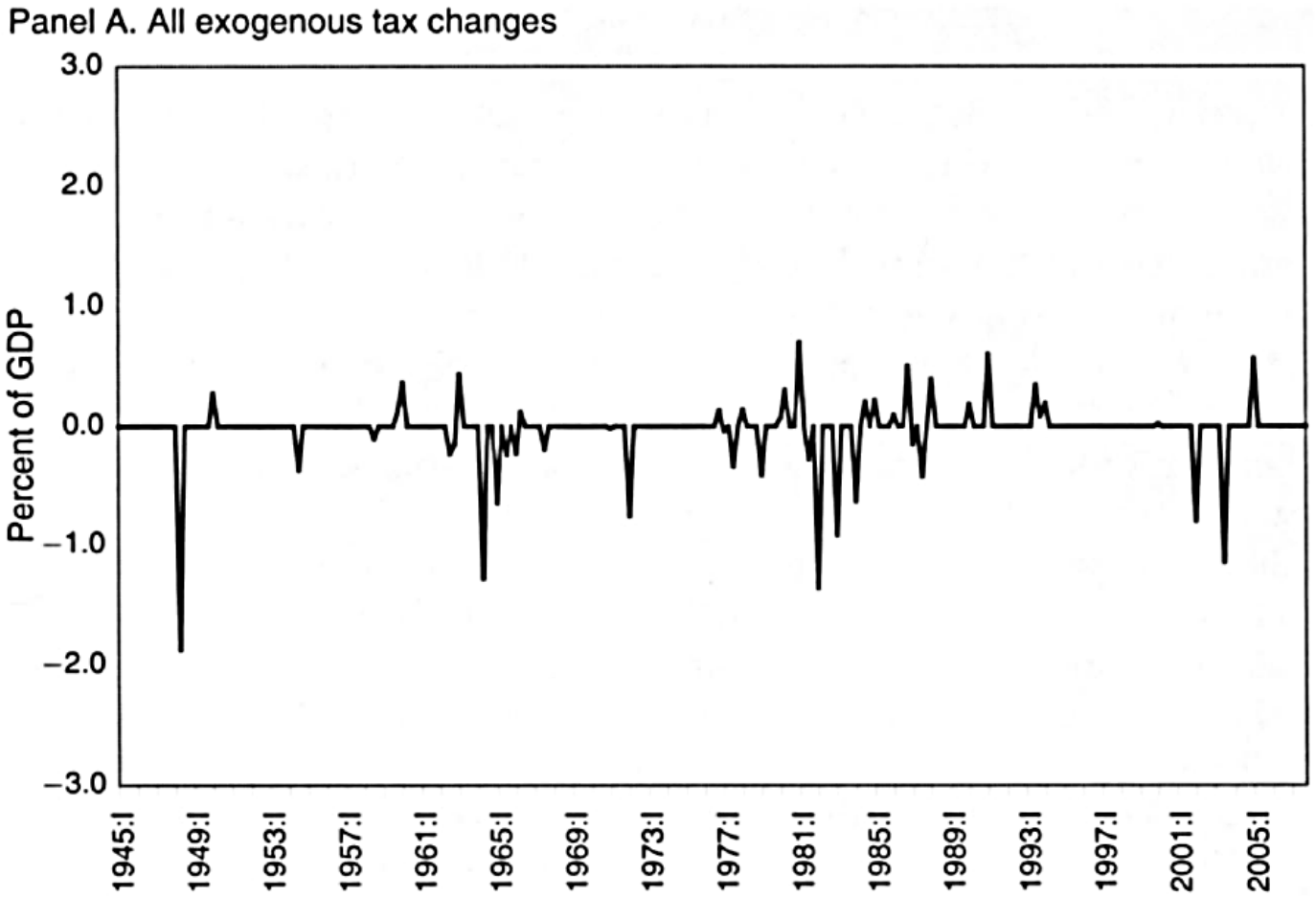
Difficulty in Estimating the Effect of Tax Changes

- Some tax cuts are taken ***because*** output is falling.
    - Would not expect output to rise following these tax cuts.
- This is an example of ***omitted variable bias***.
    - A third variable (whatever is causing the recession) is driving both output and tax changes.
    - Positive effects of tax cuts will be underestimated.

How do Romer and Romer try to deal with this difficulty?

- Identify the motivation for the tax changes using narrative sources.
    - Read Congressional reports, Presidential speeches, *Economic Report of the President*.
- Then limit the statistical analysis only to tax changes ***not*** taken in response to the state of the economy.

Exogenous Tax Changes



Source: Romer and Romer, "The Macroeconomic Effects of Tax Changes."

EXHIBIT 2—NARRATIVE ANALYSIS OF A LONG-RUN TAX CHANGE

Revenue Act of 1964

Signed: 2/26/64

Change in Liabilities (excluding retroactive changes):

1964:II	−$8.4 billion	(Exogenous; Long-run)
1965:I	−$4.5 billion	(Exogenous; Long-run)

The motivation for the 1964 tax cut was the same as for the 1962 investment tax credit: faster long-run growth. Once again, there was no fear of a recession at the time the act was proposed or passed. The Revenue Act of 1964 was first proposed in the summer of 1962. President Kennedy, in his Radio and Television Report to the American People on the State of the National Economy, stated explicitly that the tax cut was not for countercyclical reasons: "Let me emphasize, however, that I have not been talking about a different kind of tax cut, a quick, temporary tax cut, to prevent a new recession" (8/13/62, p. 5). This view was repeated in two speeches in January 1963 (Annual Message to the Congress on the State of the Union, 1/14/63, pp. 1–2; Special Message to the Congress on Tax Reduction and Reform, 1/24/63, p. 1). Likewise, the 1963 *Economic Report* stated: "We approach the issue of tax revision, not in an atmosphere of haste and panic brought on by recession or depression, but in a period of comparative calm" (p. xiii). The *Economic Report* mentioned the possible countercyclical benefits of the tax cut, but made it clear that they were a sidelight. It stated: "While the basic purpose of my tax program is to meet our longer run economic challenges, we should not forget its role in strengthening our defenses against recession" (p. xxi). A similar statement was made in the 1964 *Economic Report* (p. 8). If anything, the economy was even stronger by the time the act was passed. President Johnson, in his Annual Budget Message to the Congress, Fiscal Year 1965, cited statistics showing solid economic growth and emphasized: "This is a record of strong expansion" (1/21/64, p. 3).

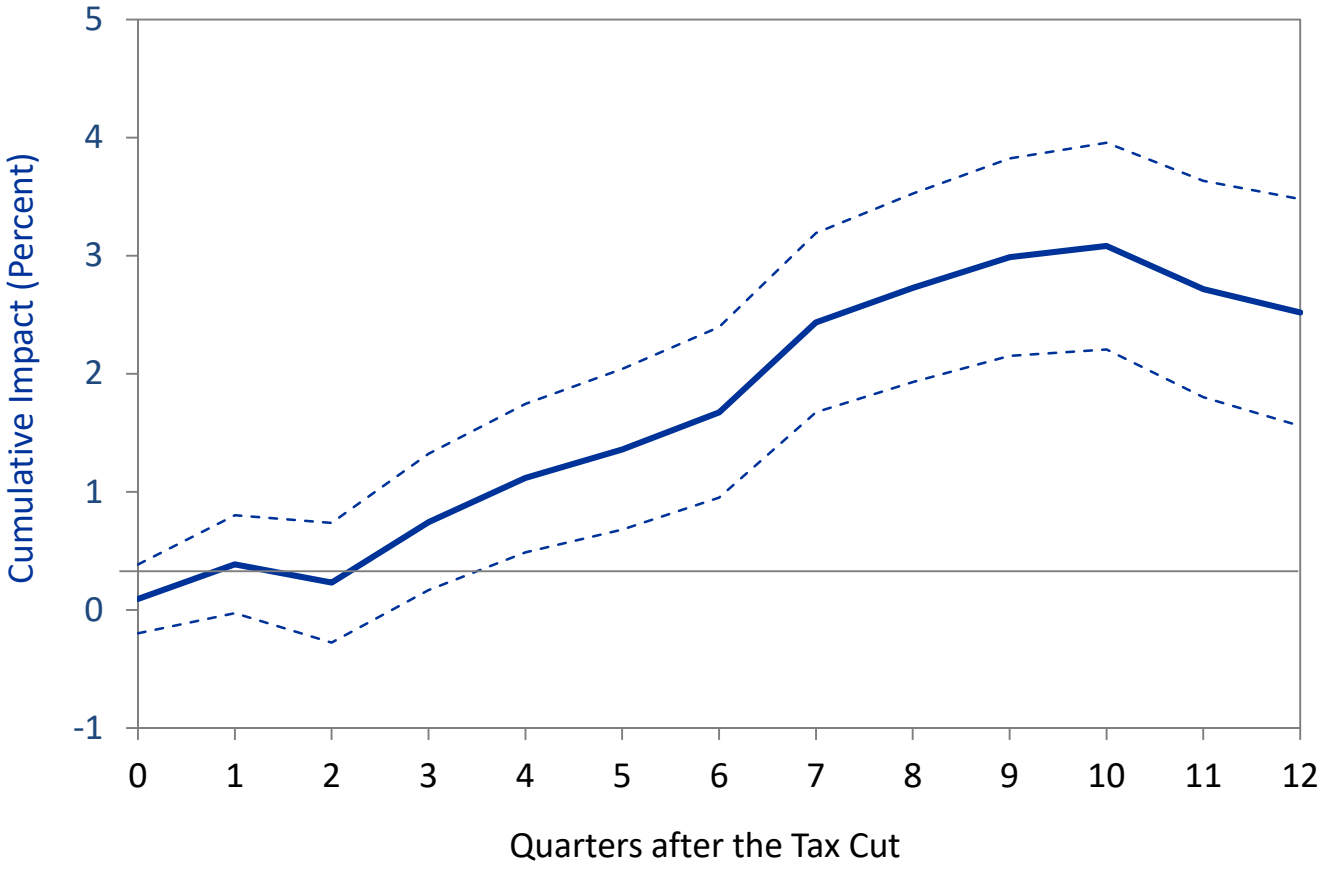
Kennedy and Johnson both gave as the rationale for the tax cut the need to eliminate fiscal drag so the economy could grow faster. In his August 1962 address, President Kennedy said: "our present tax system is a drag on economic recovery and economic growth," and "this administration intends to cut taxes in order to build the fundamental strength of our economy, to remove a serious barrier to long-term growth" (Radio and Television Report to the American People on the State of the National Economy, 8/13/62, p. 4). In his Special Message to the Congress on Tax Reduction and Reform, Kennedy stated: "the largest single barrier to full employment of our manpower and resources and to a higher rate of economic growth is the unrealistically heavy drag of Federal income taxes on private purchasing power, initiative and incentive" (1/24/63, p. 1). Johnson reiterated this view (Annual Budget Message to the Congress, Fiscal Year 1965, 1/21/64, p. 3). Both administrations argued that the tax cut would stimulate economic growth. For example, the 1964 *Economic Report* stated: "The tax cut will give a sustained lift, year-in and year-out, to the American economy" (p. 8).

Specification

$$\Delta Y_t = a + \sum_{i=0}^{M} b_i \Delta T_{t-i} + e_t$$

- ΔY is the percentage change in real GDP.
- ΔT is the new measure of exogenous tax changes (as a percent of GDP).
- The regression estimates the relationship between output growth and the contemporaneous and lagged values of tax changes.
- We expect a negative relationship.

Estimated Impact of a Tax Cut of 1% of GDP on Real GDP



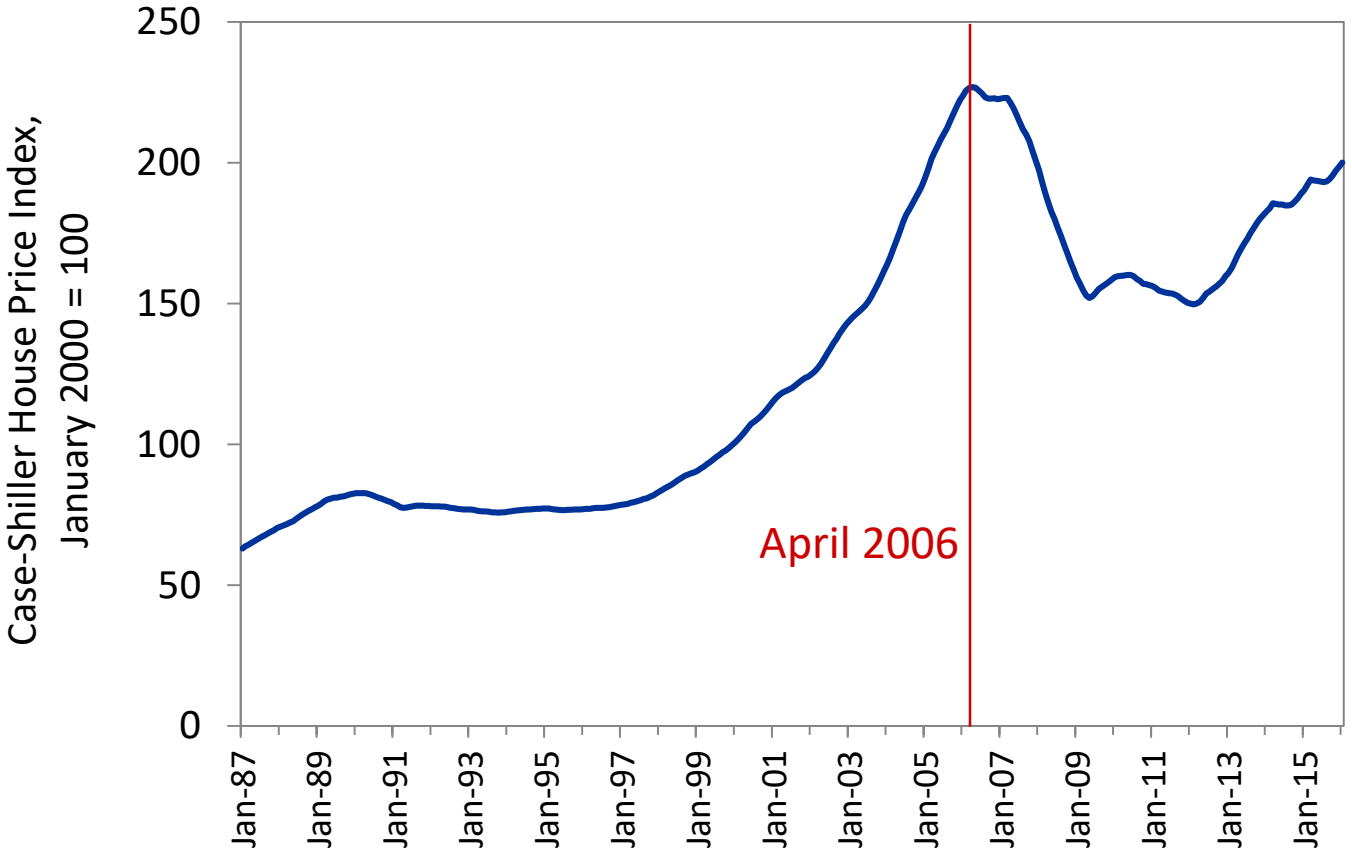
Source: Romer and Romer, "The Macroeconomic Effects of Tax Changes."

Evaluation

- Do you trust the narrative sources?
- Is narrative analysis reproducible?
- Does this approach deal with omitted variable bias successfully?

IV. Case Study: The 2008 Recession and the Fiscal Policy Response

House Prices, 1987–2015

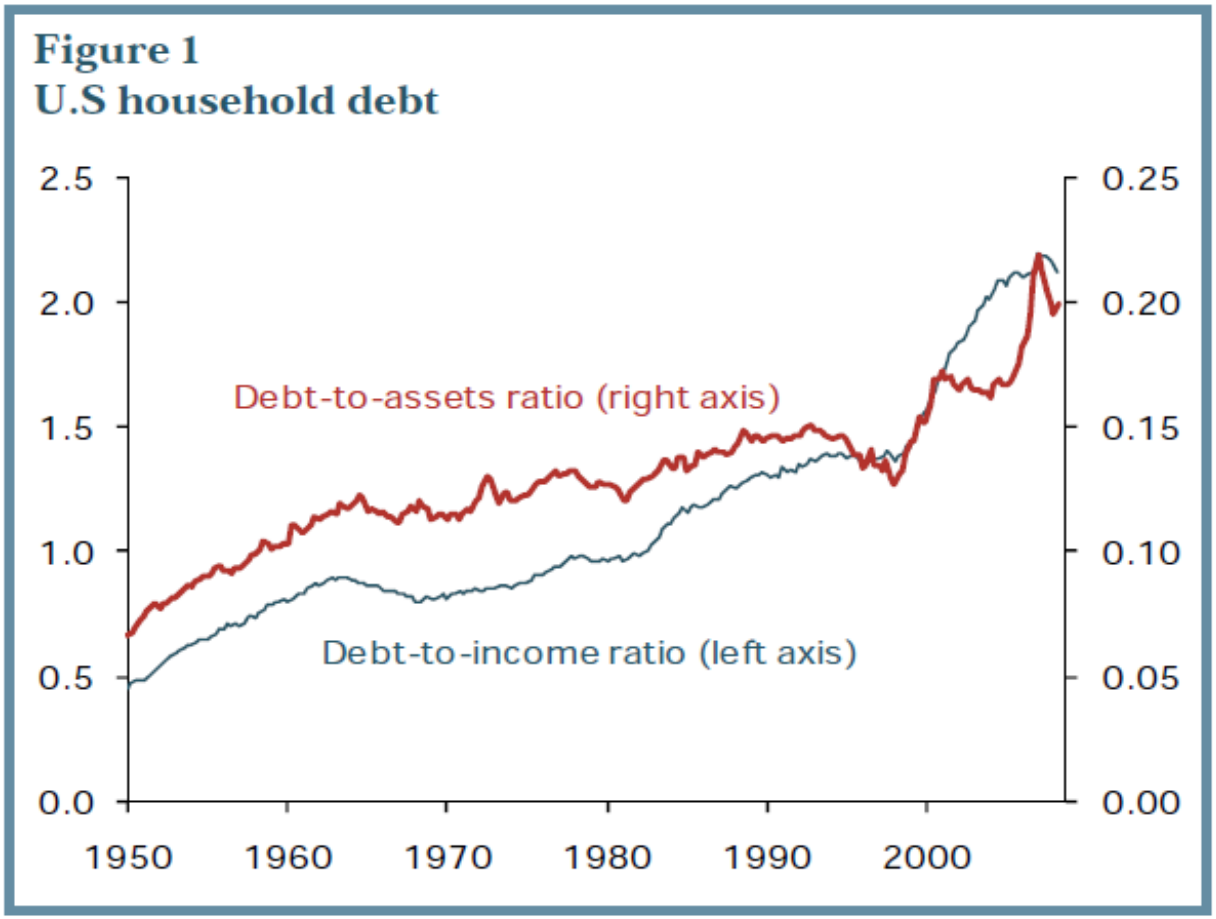


Source: Federal Reserve Bank of St. Louis, FRED.

Effects of the Housing Bubble

- Increased both I^p and C, so raised PAE relative to what it otherwise would have been.
- Some debate among economists about whether this increase in PAE counteracted other forces lowering PAE, or pushed Y above Y*.
- Large increase in household debt.

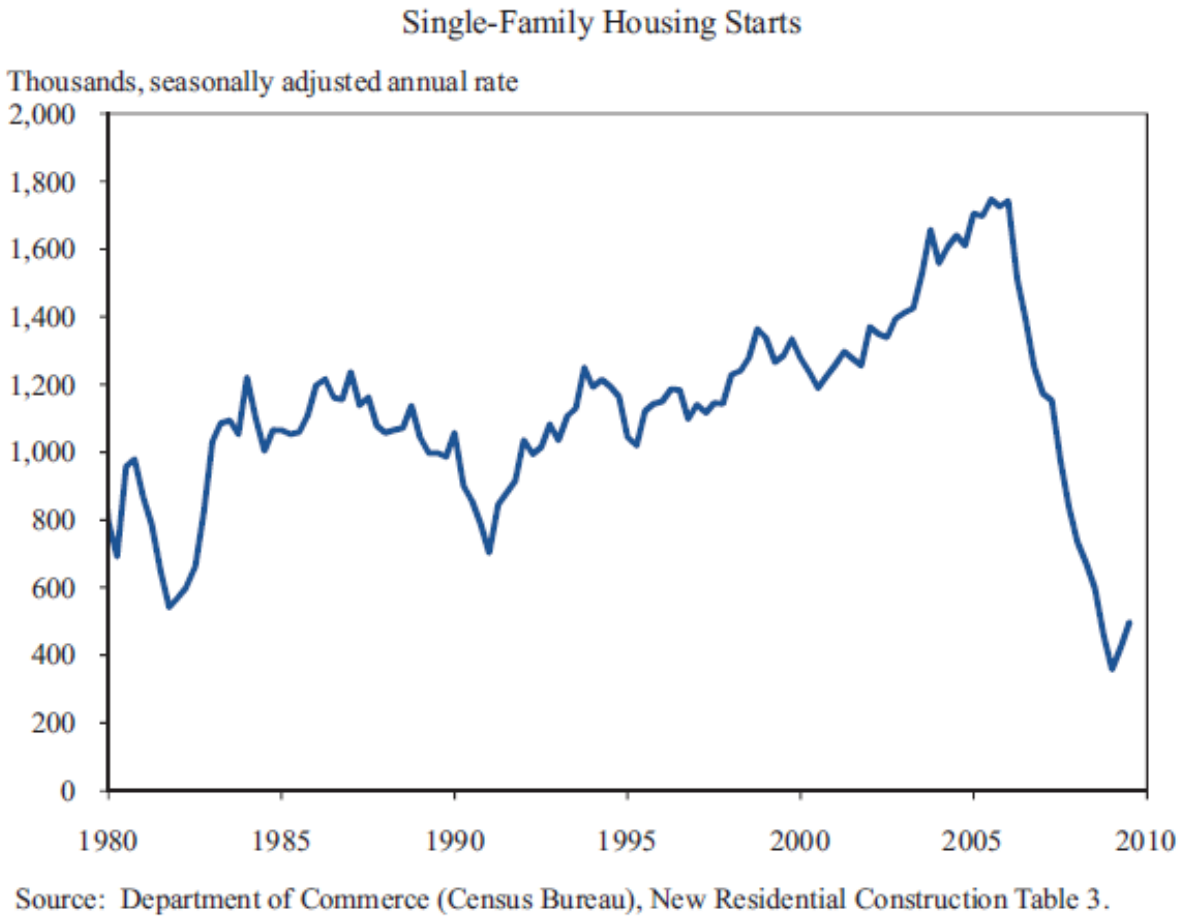
U.S. Household Debt



Source: Mian and Sufi, "Consumers and the Economy, Part II: Household Debt and the Weak U.S. Recovery."

What happened when the bubble burst?

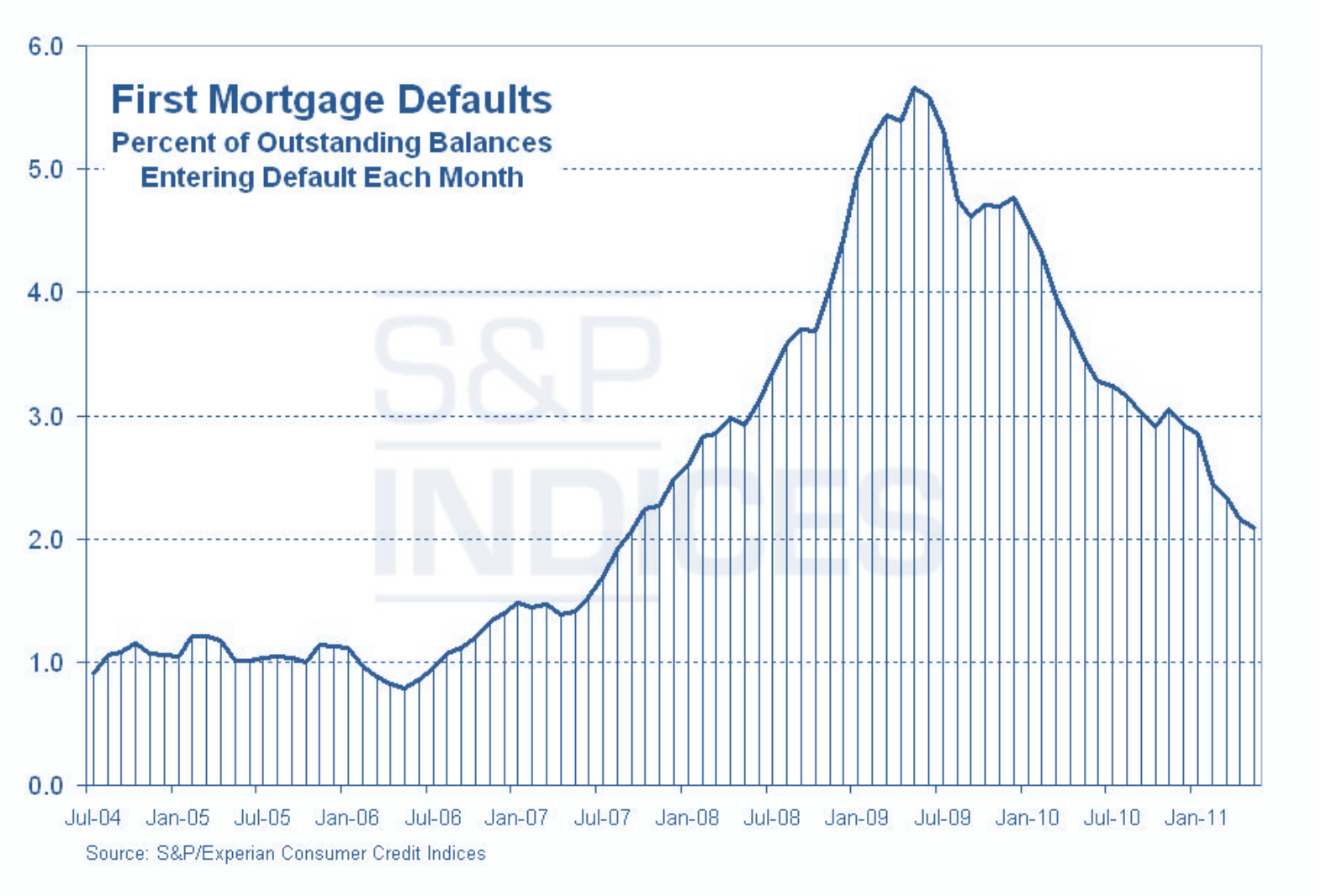
Single-Family Housing Starts



Source: *Economic Report of the President*, February 2010.

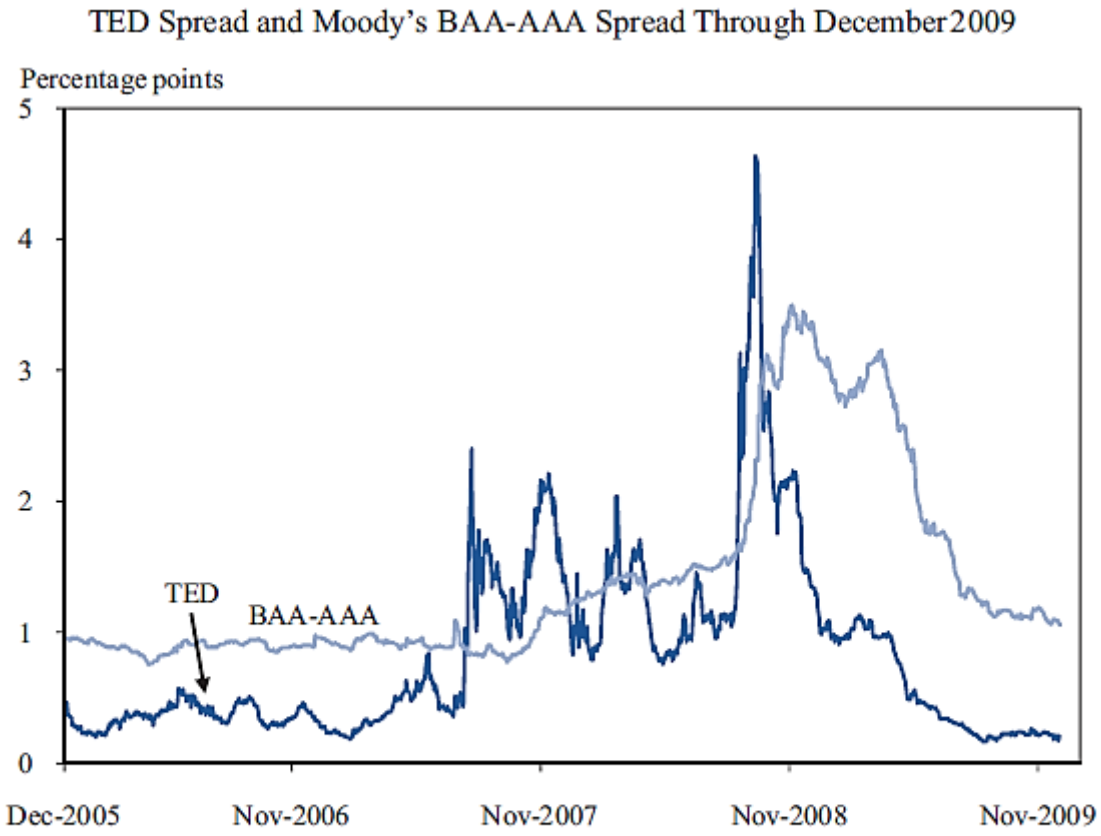
Real Personal Consumption Expenditures

Source: FRED, Bureau of Economic Analysis.



Source: http://www.housingviews.com.

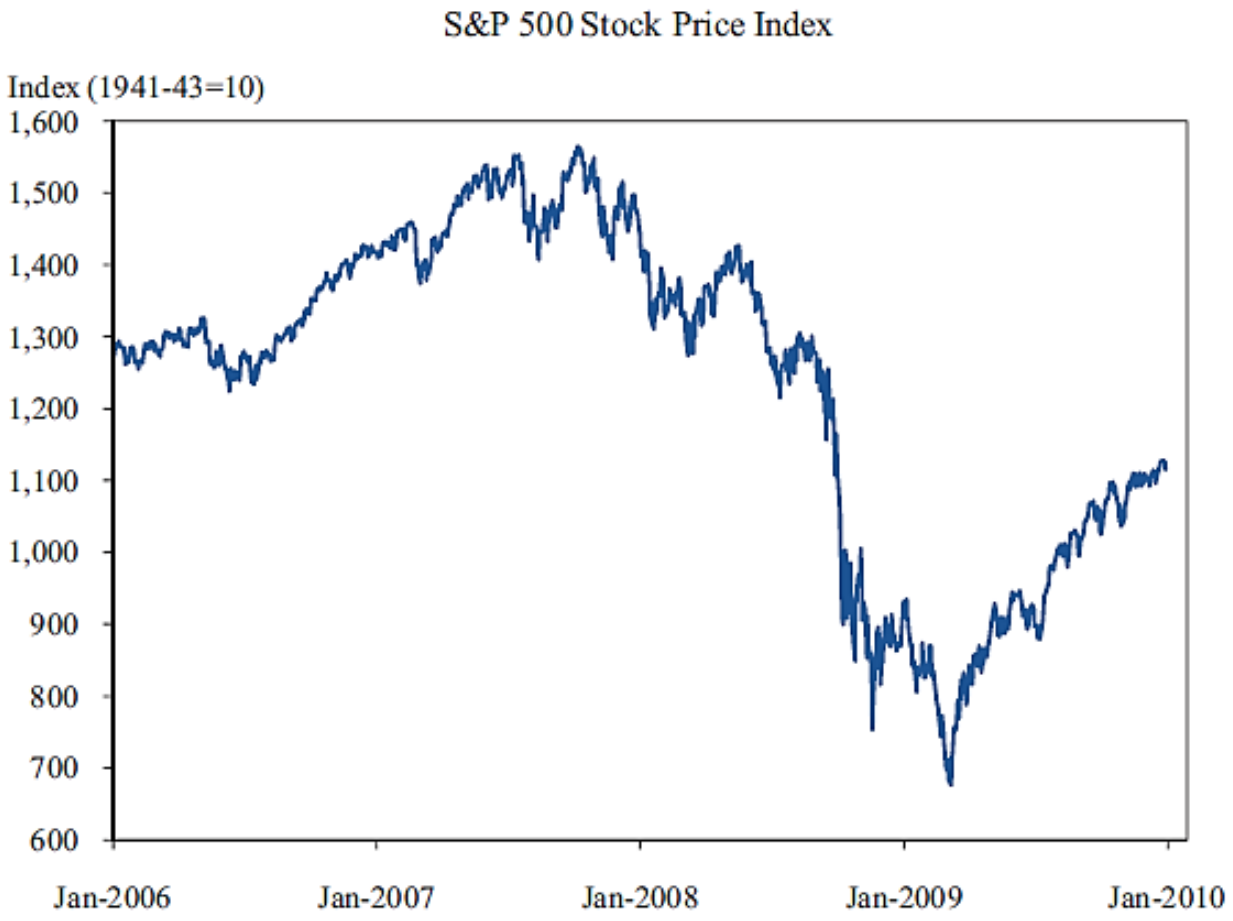
Credit Spreads during the Financial Crisis



Notes: The TED spread is defined as the three-month London Interbank Offer Rate (LIBOR) less the yield on the three-month U.S. Treasury security. Moody's BAA-AAA spread is the difference between Moody's indexes of yields on AAA and BAA rated corporate bonds.

Source: *Economic Report of the President*, February 2010.

Stock Prices during the Financial Crisis

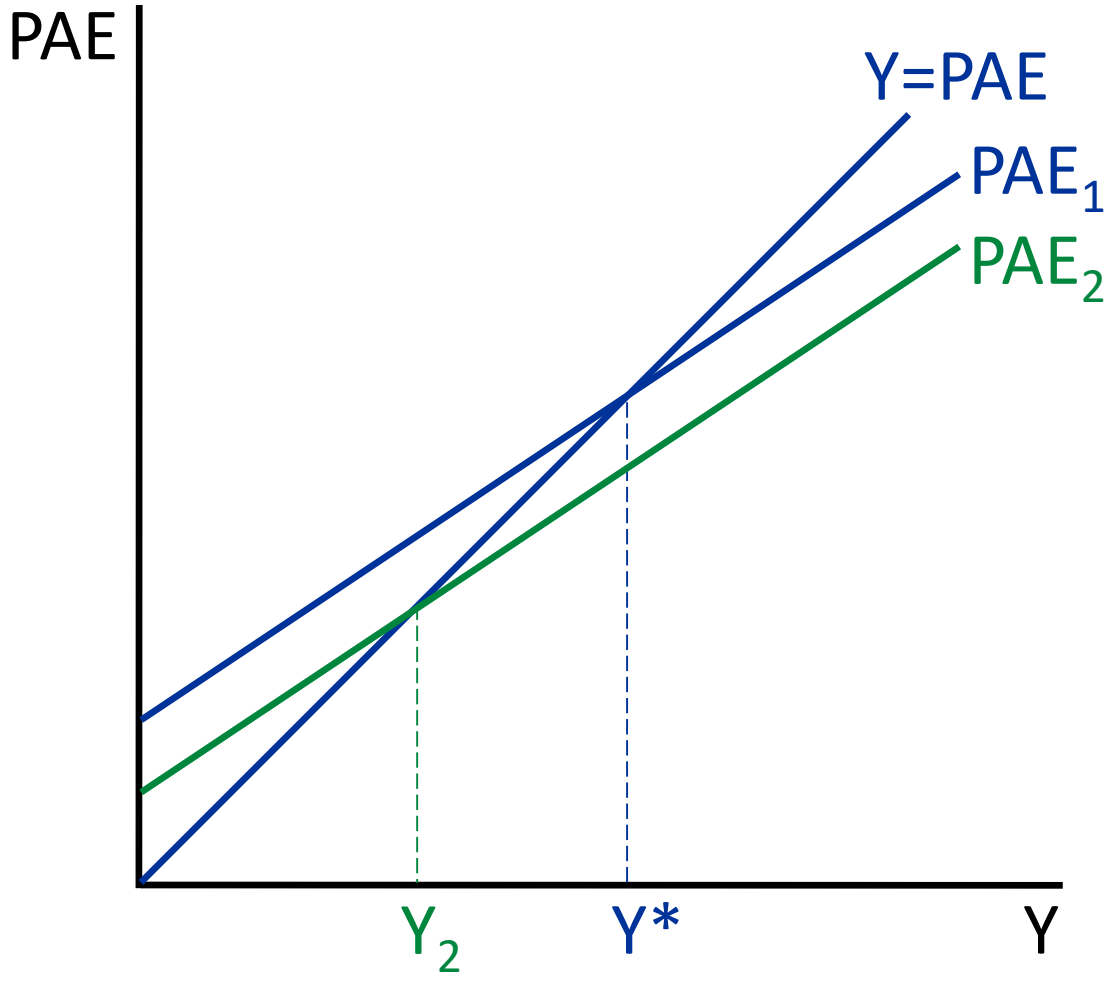


Source: *Economic Report of the President*, February 2010.

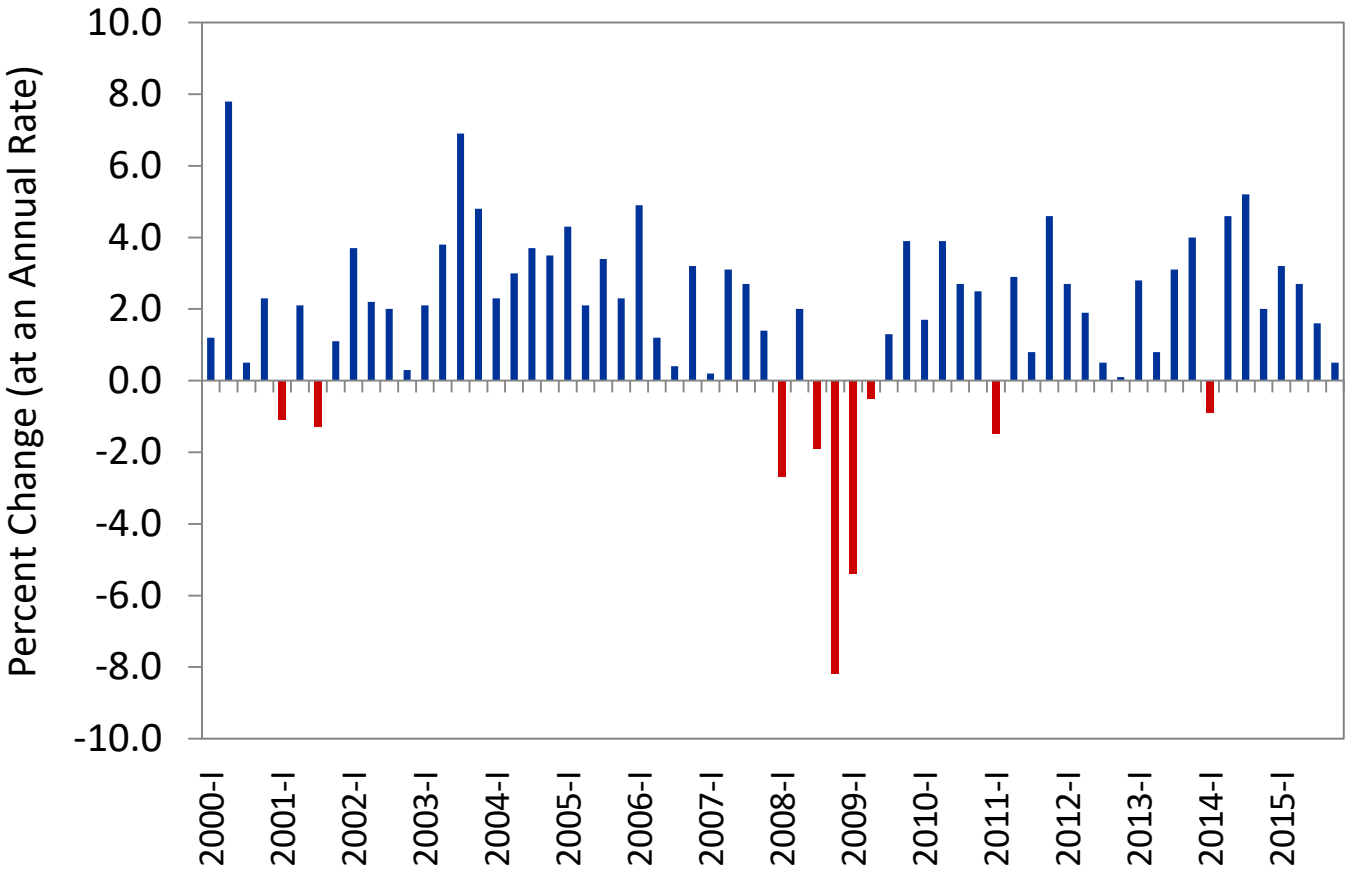
What happened to PAE in 2008?

- Decline in investment (particularly in housing)
  - Housing bust reduced expected future MRP_K of housing (which is a kind of capital).
  - Financial crisis hurt animal spirits and made it hard for firms to get credit.
- Decline in consumption
  - Housing bust and stock market decline destroyed wealth.
  - Financial crisis hurt consumer confidence and made it hard for households to get credit.

Effect of the Housing Bust and the Financial Crisis on Output



Percentage Change in Real GDP



Source: Federal Reserve Bank of St. Louis, FRED

Issues in Designing the 2009 Fiscal Stimulus

- How big should it be?
  - Need an estimate of how much PAE has shifted down.
  - Or, alternatively, how much Y would fall (and unemployment would rise) as a result of the decline in PAE.
  - Forecasts were much too optimistic early in the recession.

Issues in Designing the 2009 Fiscal Stimulus

- What should the composition be?
  - Different types of stimulus have different effects on PAE.
  - $100 billion increase in G will increase PAE by $100 billion; $100 billion of tax cuts will increase PAE by MPC·$100 billion.
  - Different types of stimulus affect the economy with different speeds.

Fiscal Stimulus in the Recovery Act through August 2009

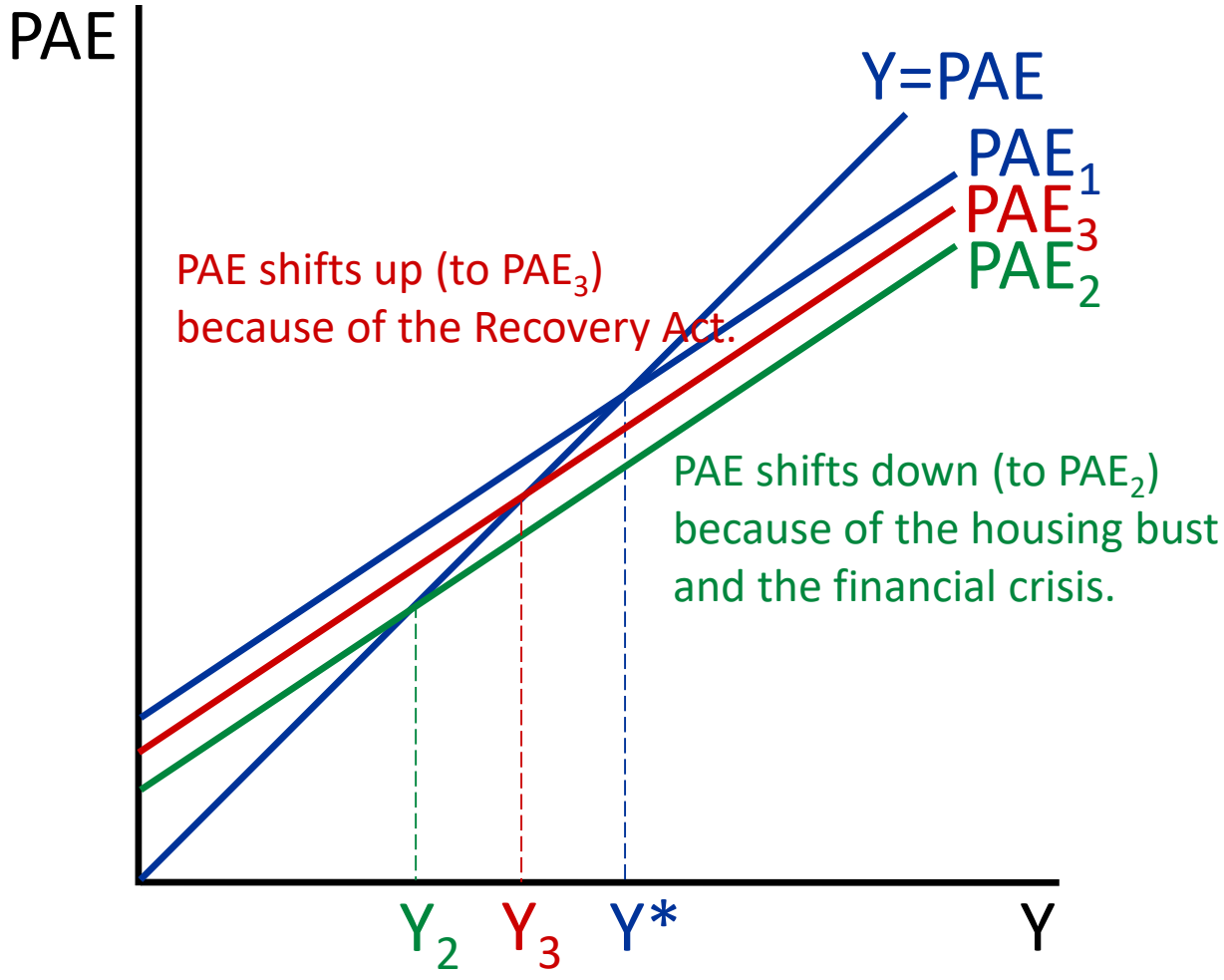
	Through the end of		
	March[a]	June[b]	August[c]
	Billions of Dollars		
Individual Tax Cuts	2.3	29.3	40.0
AMT Relief	0.0	7.6	8.8
Business Tax Incentives	0.1	14.4	17.2
State Fiscal Relief	8.5	28.2	38.4
Aid to Directly Impacted Individuals	0.8	14.4	30.6
Government Investment Outlays	0.0	5.9	16.5
Total[d]	**11.8**	**99.8**	**151.4**

Source: CEA, "The Economic Impact of the ARRA of 2009, First Quarterly Report."

Issues in Designing the 2009 Fiscal Stimulus

- How long should it last?
  - Need a forecast of how long PAE will be depressed.
  - If PAE will be low for more than a year, fiscal stimulus needs to last for more than a year as well.

Effect of the Recovery Act on Output



Estimates of the Impact of the Recovery Act

Table 1.

Estimated Macroeconomic Impact of the American Recovery and Reinvestment Act, 2009 to 2012

	Change Attributable to ARRA							
	Real Gross Domestic Product (Percent)		Unemployment Rate (Percentage points)		Employment (Millions of people)		Full-Time-Equivalent Employment (Millions)[a]	
	Low Estimate	High Estimate	Low Estimate	High Estimate	Low Estimate	High Estimate	Low Estimate	High Estimate
	2009 (Calendar Year Quarter)							
Q1	0.1	0.1	*	*	*	*	*	0.1
Q2	0.8	1.4	-0.2	-0.3	0.3	0.5	0.4	0.7
Q3	1.2	2.5	-0.3	-0.6	0.6	1.2	0.9	1.7
Q4	1.5	3.4	-0.5	-1.1	0.9	1.9	1.4	2.8
	2010 (Calendar Year Quarter)							
Q1	1.8	4.3	-0.7	-1.5	1.2	2.7	1.8	4.0
Q2	1.6	4.6	-0.8	-1.8	1.4	3.4	2.0	4.8
Q3	1.4	4.2	-0.8	-2.0	1.4	3.6	2.0	5.2
Q4	1.1	3.5	-0.7	-1.9	1.3	3.5	1.8	5.0

Source: CBO, "Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output," February 2011.