Financial Crises and the Great Recession

ECON 30020: Intermediate Macroeconomics

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Readings

- GLS Ch. 33

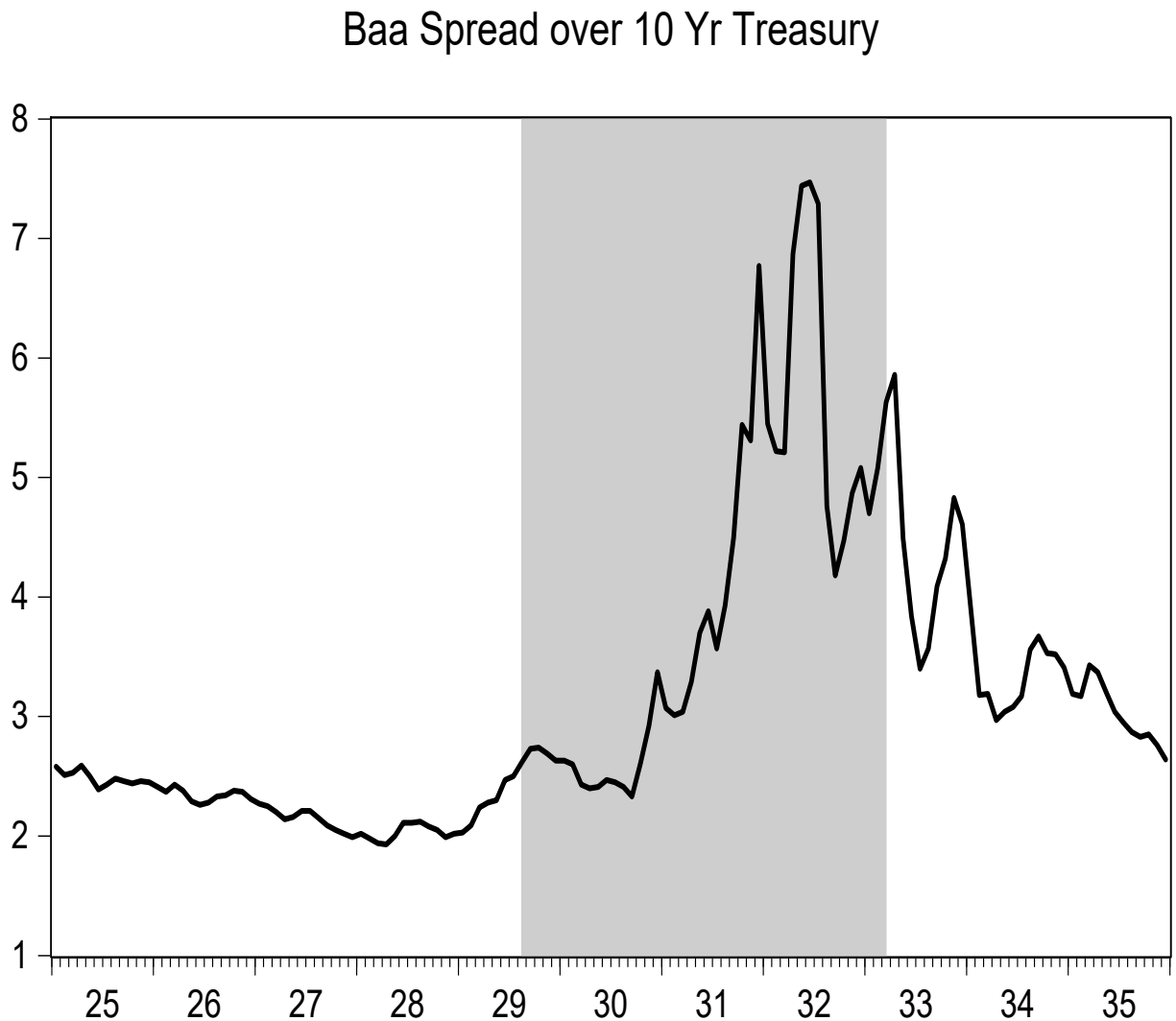
Financial Crises

- Financial crises are a recurrent theme in modern economies
- Were very common in the US prior to the founding of the Federal Reserve in 1913
- Since the Fed's founding, we have suffered two large financial crises and ensuing deep economic contractions – the Great Depression and the Great Recession
- Although sharing many similarities, the Great Depression was far worse than the Great Recession
- In large part due to policy improvements

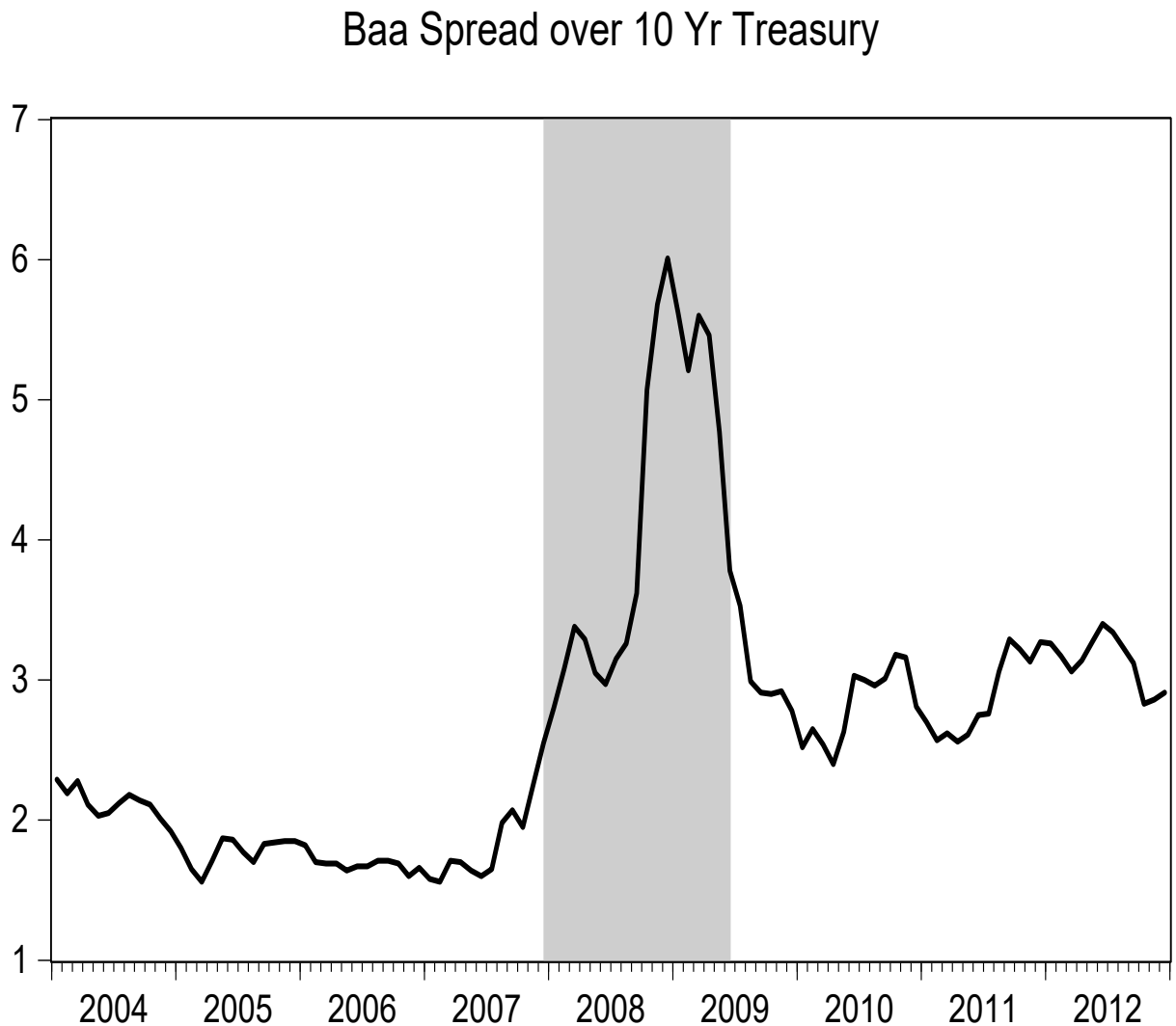
Credit Spreads

- The tell-tale sign of a financial crisis is a large increase in credit spreads (f_t in our model-based notation)
- Usually measured as the spread between comparatively "risky" debt (e.g. Baa-rated corporate debt) over comparatively safer debt (e.g. government debt)
- The increase in credit spreads leads to a collapse in investment demand and an inward shift of the IS and AD curves
- This results in a loss of output
- If ZLB binds, loss in output can be very big

Credit Spreads – Great Depression



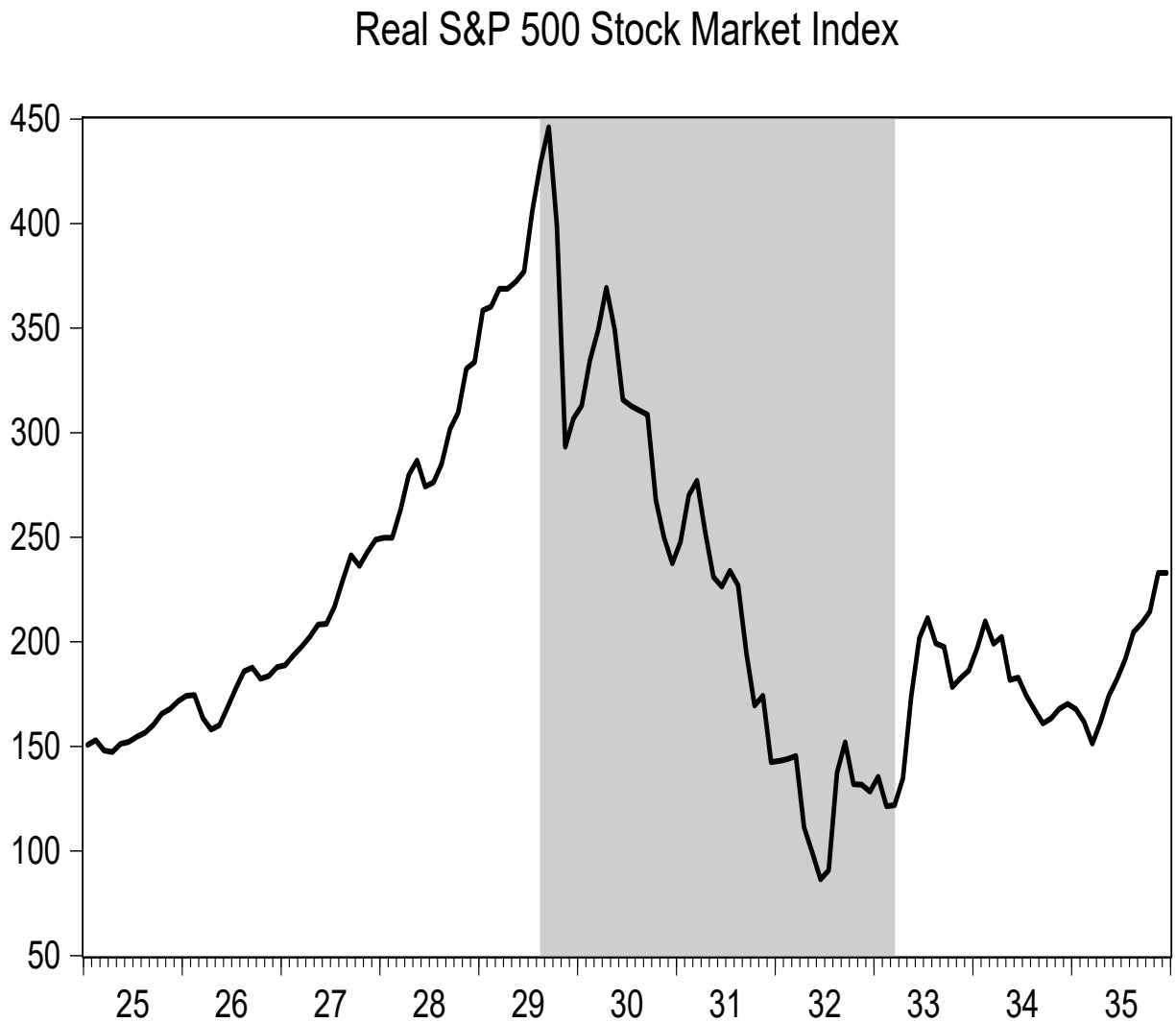
Credit Spreads – Great Recession



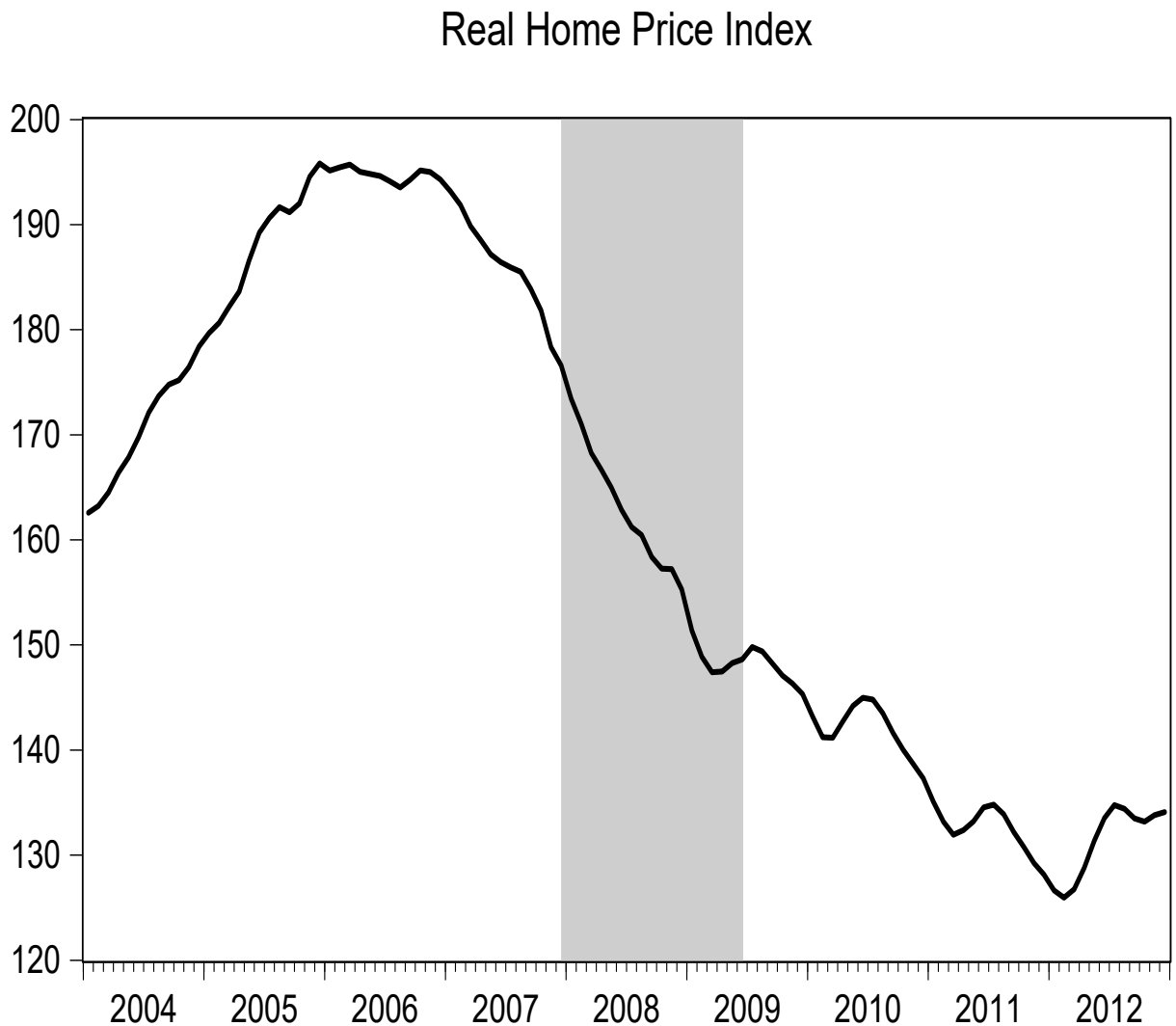
Why do Credit Spreads Rise?

- Financial crises typically follow asset price busts
- For our purposes we don't need to worry about *why* asset prices bust, just take as given that they do
- A large decline in asset prices makes liability holders (e.g. depositors) wary about the financial condition of financial institutions funding those assets
- This can trigger a banking panic/run in which liability holders try to withdraw their funds
- To raise cash, financial institutions have to sell assets and cut back on credit supply more generally
- This drives up the cost of credit, f_t

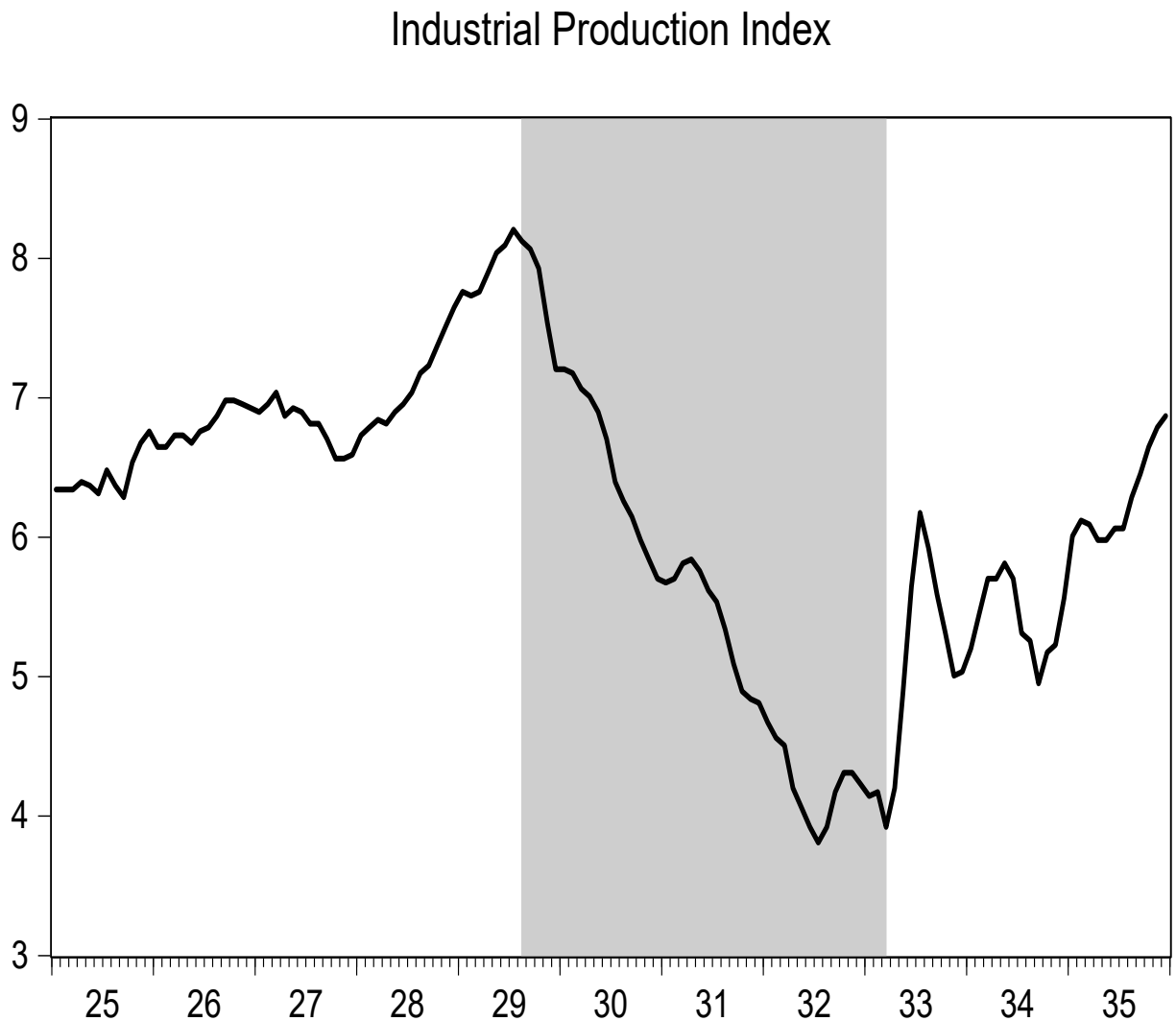
Stock Market Crash – Great Depression



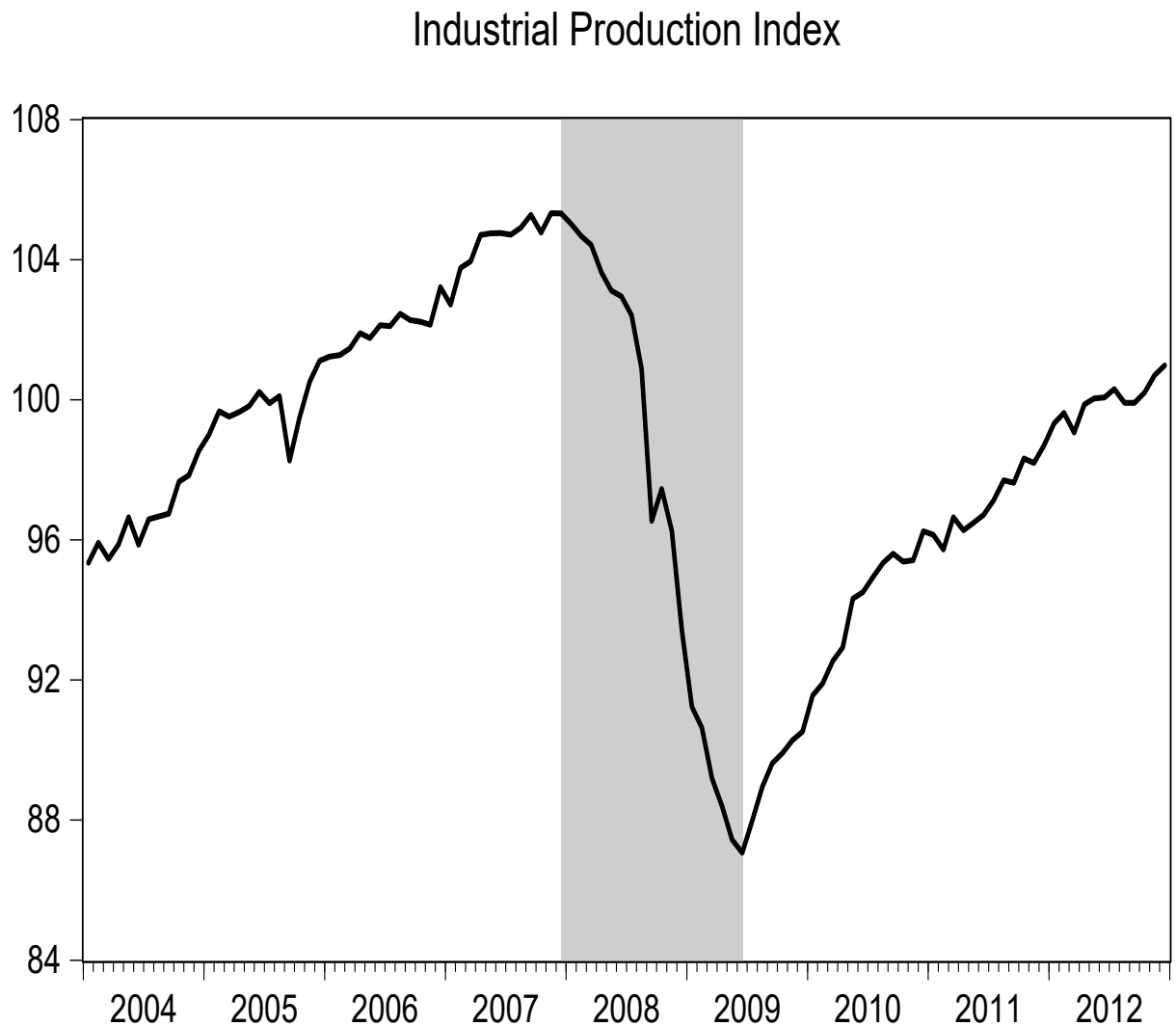
Housing Market Collapse – Great Recession



Economic Contraction – Great Depression



Economic Contraction – Great Recession



Nature of the Runs

- The Great Depression was a traditional bank run – depositors tried to withdraw to get cash, forcing banks to sell assets, and an enormous number of banks failed
- The Great Recession was a bit different
- It wasn't a traditional run in that it wasn't a run on deposits by individuals, and was therefore harder for the average person to see
- Rather than a run by individuals on banks, it was a run by institutions on other institutions
- In particular, losses in the housing market triggered fears about the value of backing collateral in short term repurchase agreements
- This triggered a "run on Repo" (Gorton 2010; Gorton and Metrick 2012) and a large decline in the supply of credit
- This drove up credit spreads and led to a sharp decline in economic activity

Stylized Example

- Suppose that there are two players – Bear Stearns and Fidelity
- Bear Stearns purchases securitized mortgage products (MBS)
- It finances these purchases by borrowing in the Repo market from Fidelity
- Fidelity "deposits" funds with Bear, and in event Bear doesn't give the money back Fidelity gets to keep the MBS

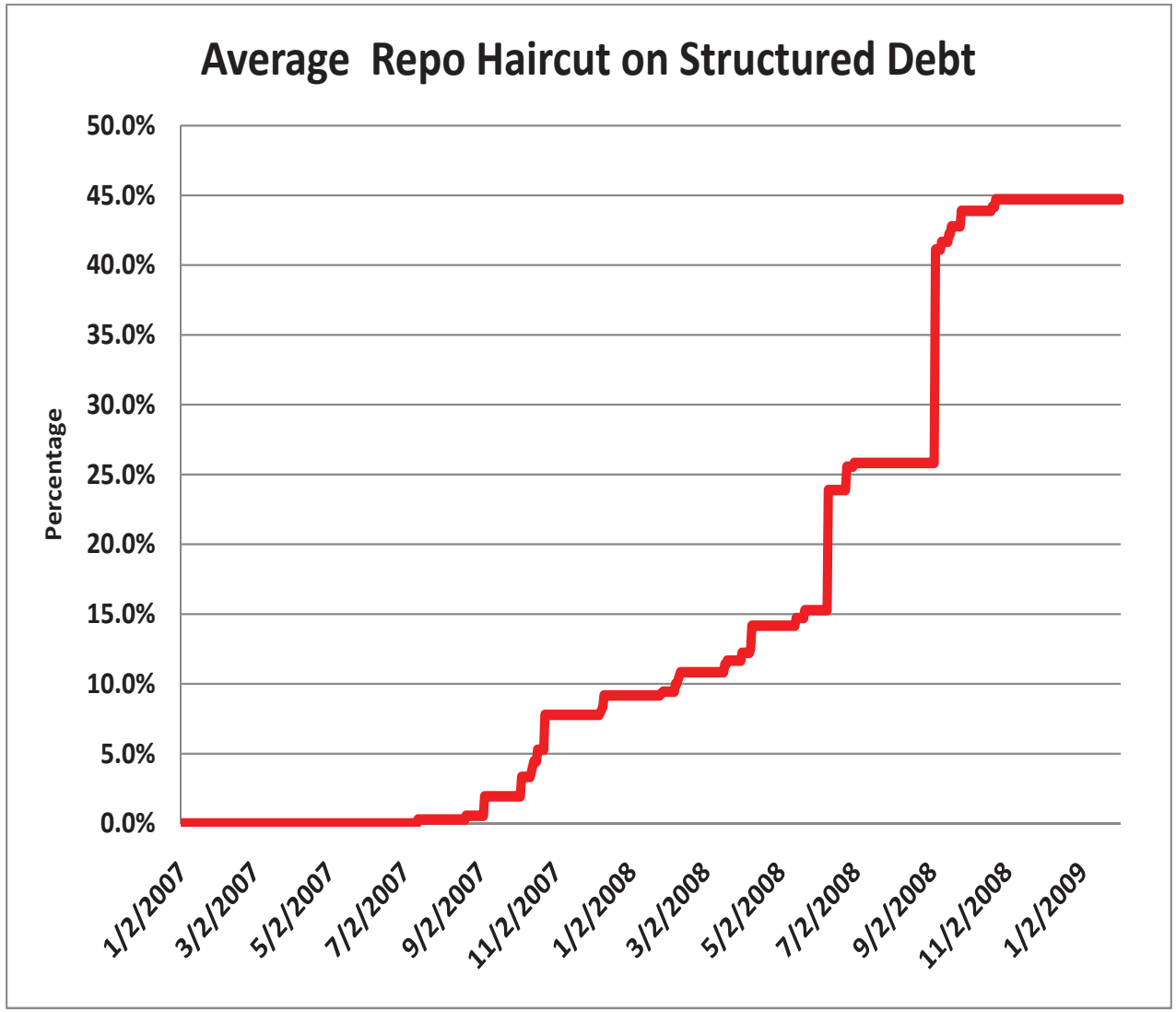
Assets	Liabilities plus Equity
MBS: \$500	Repo: \$500
Other Securities: \$100	
Cash: \$100	Equity \$200

- Just like traditional banking – Bear earns something (r^l) on the MBS and pays something (the Repo rate, r) for the borrowed funds
- Repo are very short term but can be "rolled" – very similar to checking account

Haircuts

- In a Repo transaction, you "deposit" funds in exchange for collateral in case the counterparty can't return your funds on demand
- Need the collateral to make the "deposit" safe – there is no deposit insurance here
- MBSs were used as the collateral
- Haircut: percentage difference between amount you deposit and amount of collateral
- Prior to the crisis: haircuts were zero
- At height of crisis: haircuts were 40 percent or higher. What this means is you "deposit" $300 in exchange for $500 in MBS
- Haircuts going from 0 to 40 percent – like a "withdrawal" of $200. You only "roll" $300 of the loan but Bear must still provide $500 in MBS

Haircuts in the Great Recession (Gorton 2010)



The Run on Repo

- The reason haircuts went up (i.e. the reason large institutional investors like Fidelity were less willing to lend in the Repo market) is because of concerns of the value of the MBSs
- Because of innovations in mortgage finance, default rates on many types of mortgages (sub-prime) were highly susceptible to house prices. Declining prices $\Rightarrow$ increased defaults
- Increased defaults makes cash flows from MBS, and hence the value of MBS, highly uncertain. Even if most mortgages weren't in default, through securitization it was hard to know where the risks were
- Concerned about the value of the collateral, institutional investors were less willing to "deposit" and demanded large haircuts, effectively amounting to a withdrawal
- This necessitated "fire sales" of lots of assets *completely unrelated to the housing market* for shadow banks like Bear Stearns to come up with cash

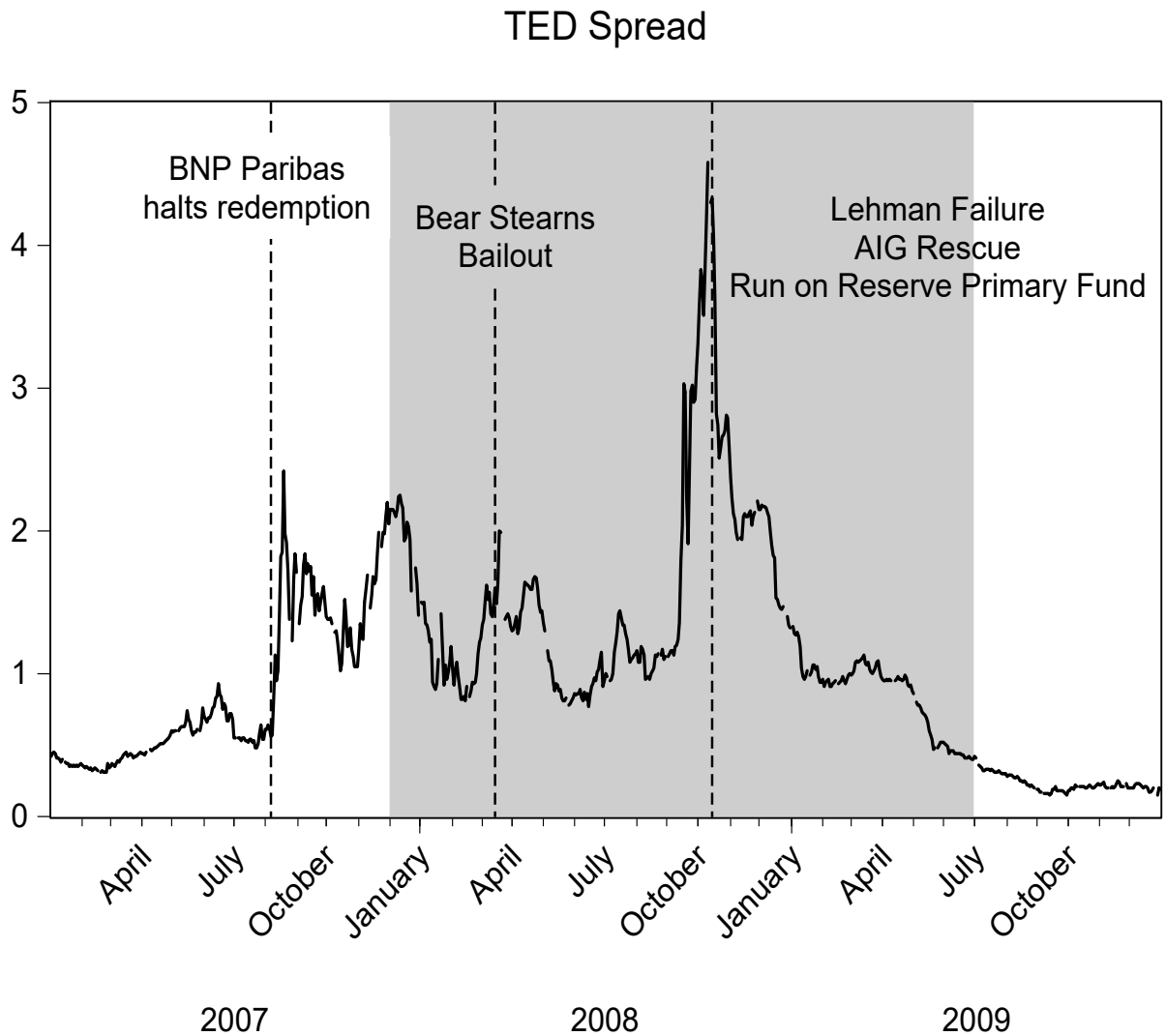
The Run on Repo: T-Accounts

- Moving from 0 to 40 percent haircut – like a \$200 withdrawal

Assets	Liabilities plus Equity
MBS \$500	Repo: \$300 (-200)
Other Securities: \$0 (-100)	
Cash: \$0 (-100)	Equity \$200

- Bear has to part with its cash and sell non-mortgage related assets to come up with the \$200 in cash
- Any further withdrawal and Bear is in trouble
- Institutions selling rather than buying assets – decline in supply of credit, driving spreads up

Daily TED Spread



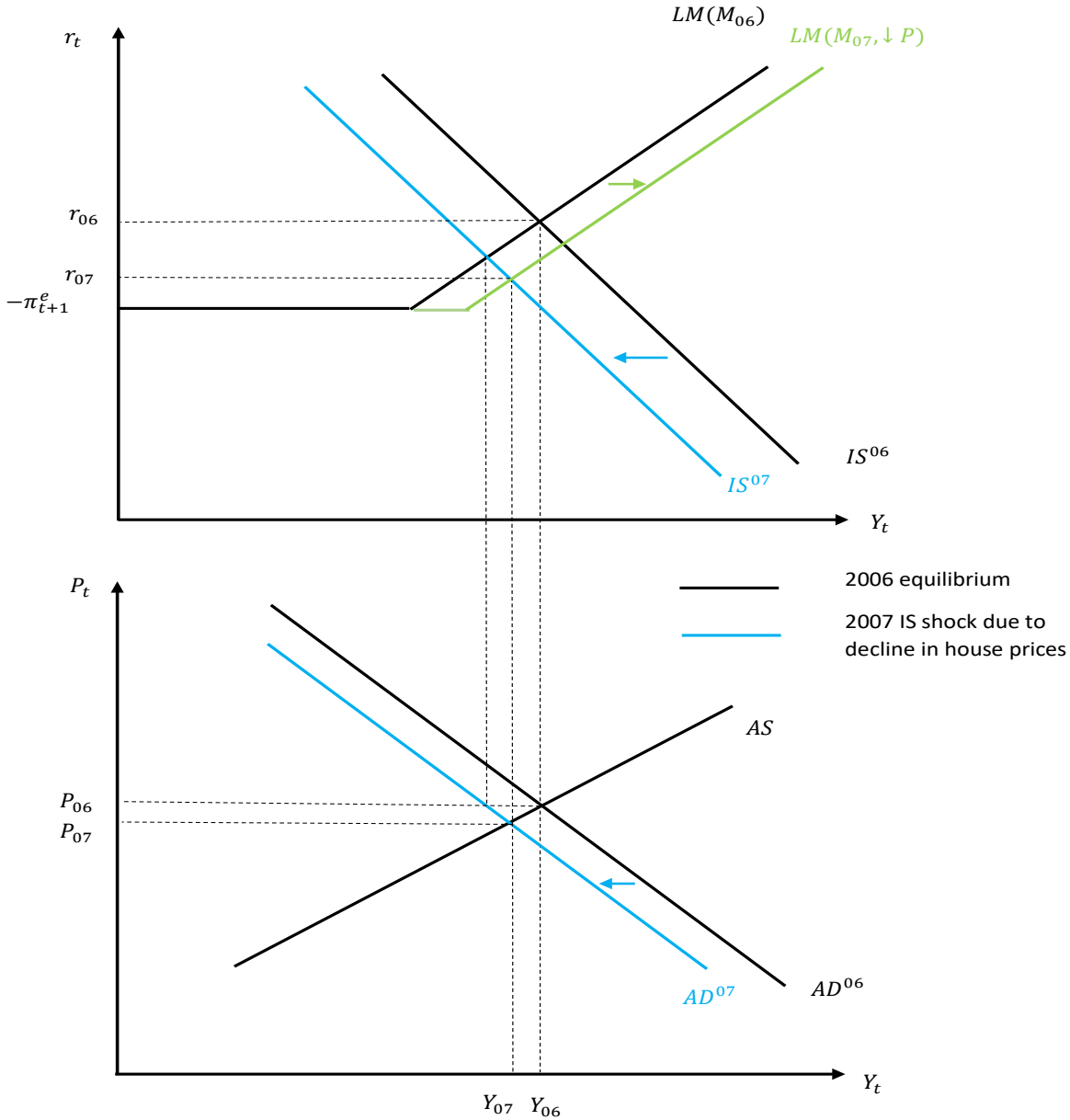
A Chronology of the Crisis

- Loosely, we can think about the crisis proceeding as follows:
  1. Decline in house prices
  2. Concerns about value of backing collateral in Repo market
  3. Run on Repo
  4. "Fire sales" of assets
  5. General decline in supply of credit and increase in credit spreads
- Cause of the crisis was collapse in house prices, but this wasn't enough on its own to cause a major recession
- Interaction between house prices and interbank lending markets drove up credit spreads and resulted in a general collapse in economic activity

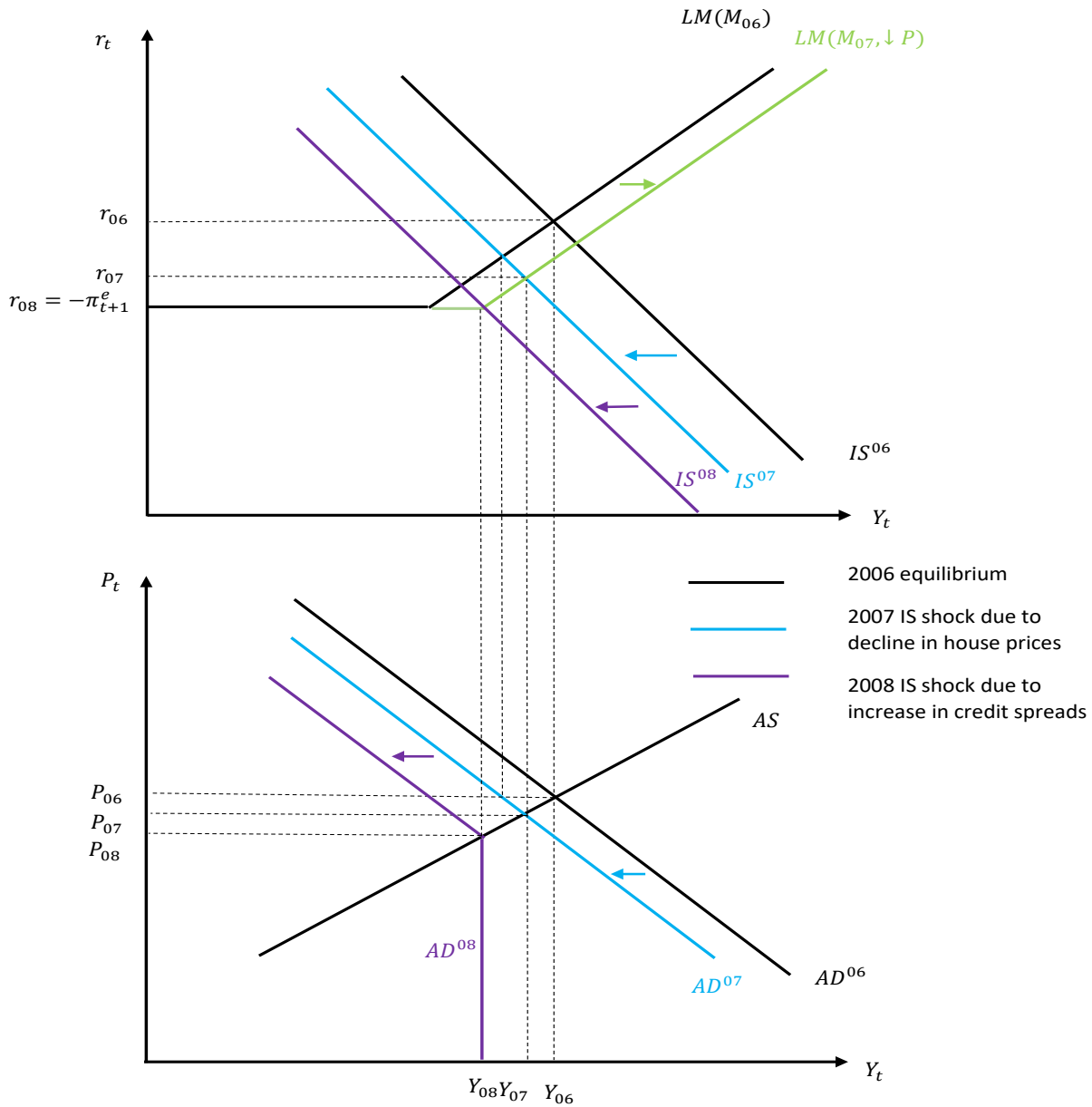
Analyzing the Crisis in the AD-AS Model

- Can divide it roughly into three stages:
  1. Stage 1: Decline in house prices (2006-2007). Fed responds by lowering interest rates
  2. Stage 2: Early stages of financial crisis (2007-2008). Fed lowers rates more, but then ZLB binds
  3. Stage 3: Intensification of financial crisis (2008-2009). Exacerbated by ZLB
- Had there been no financial crisis (Stages 2 and 3), it wouldn't have been a bad recession
- Had there been no ZLB, it wouldn't have been as bad
- Lots of "unconventional" policy in the immediate aftermath

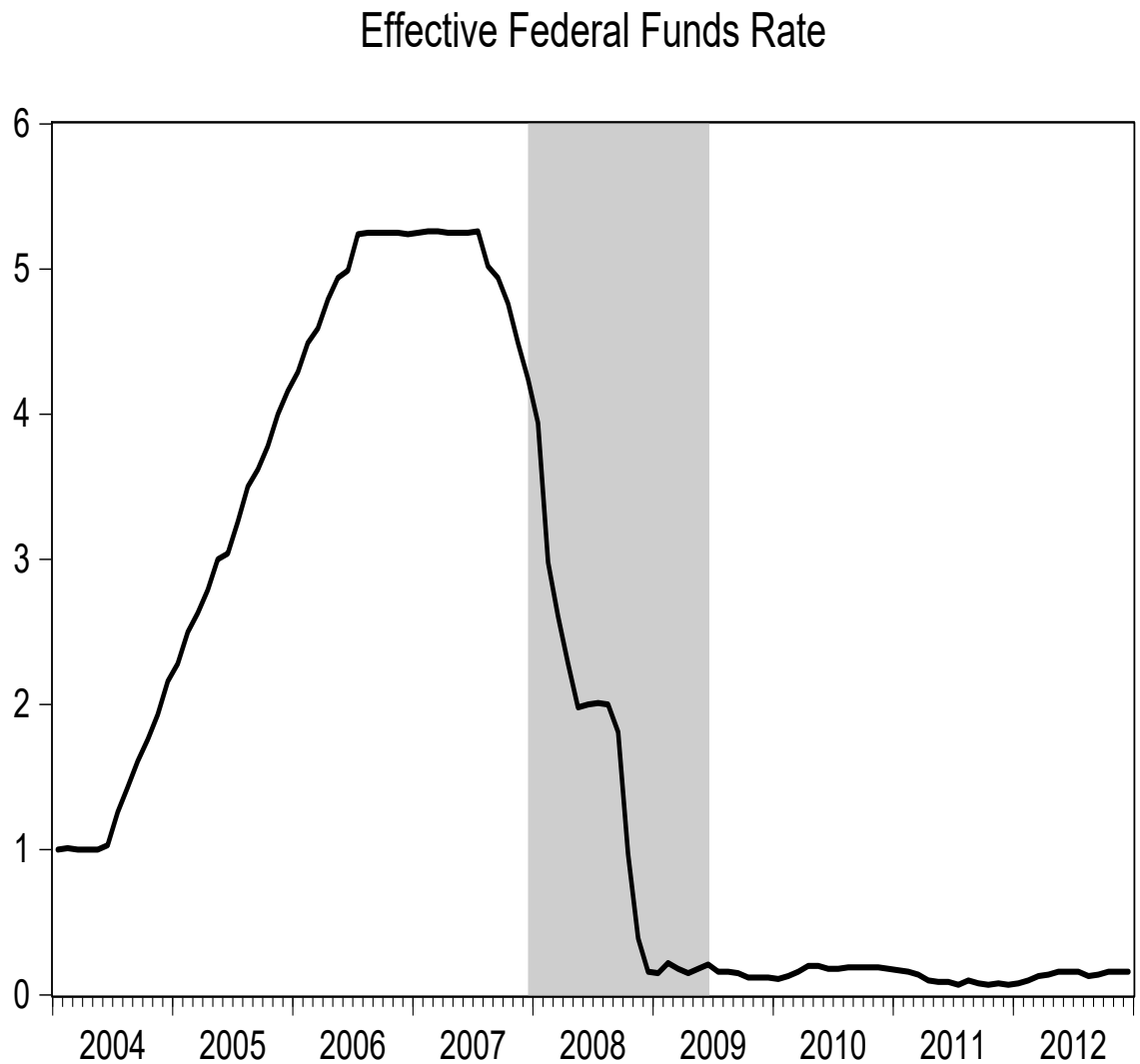
Stage 1: House Price Decline has (mild) Wealth Effect on IS and AD Curves



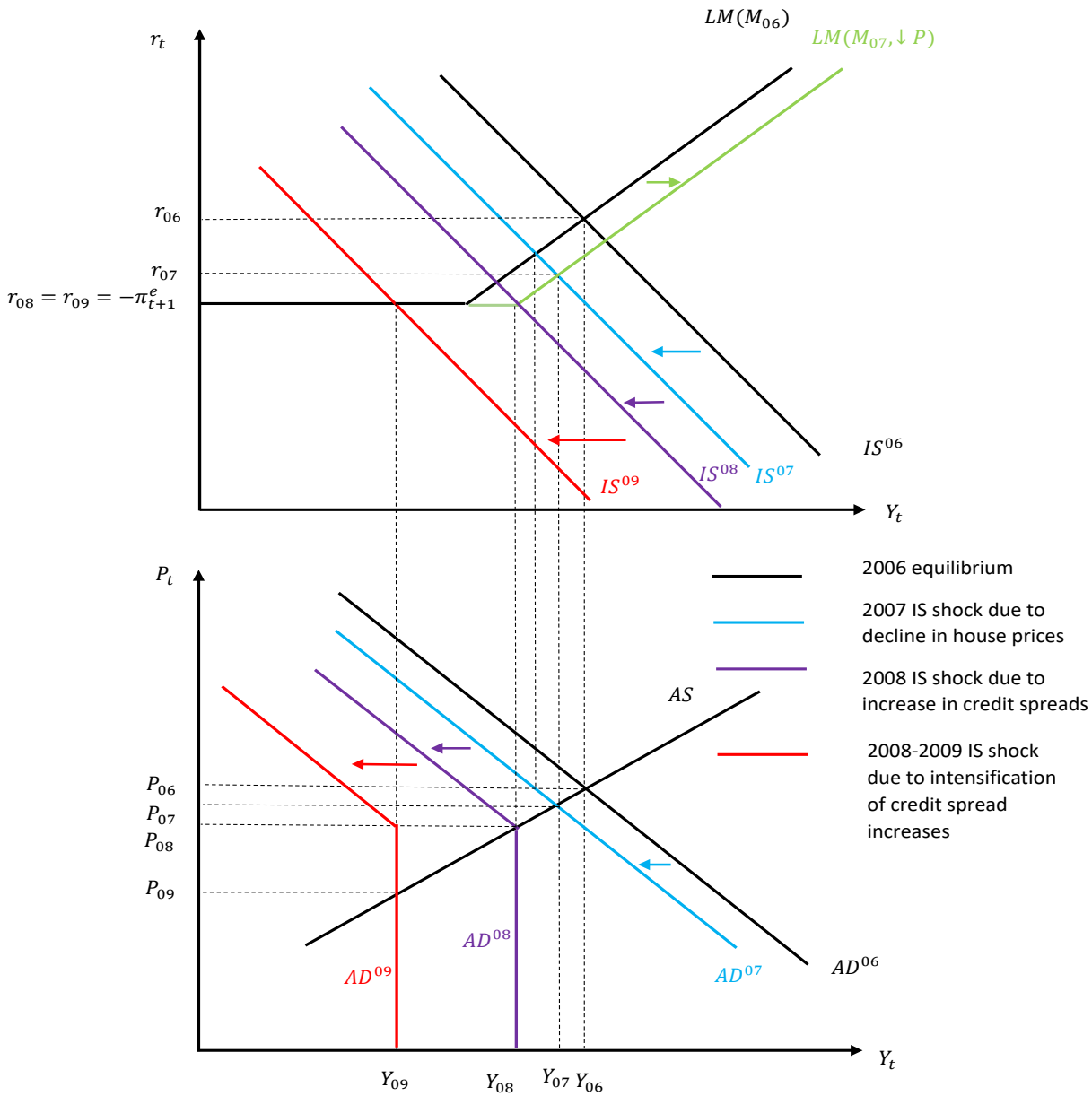
Stage 2: Early Stages of Financial Crisis



Stage 2: Binding ZLB by late 2008



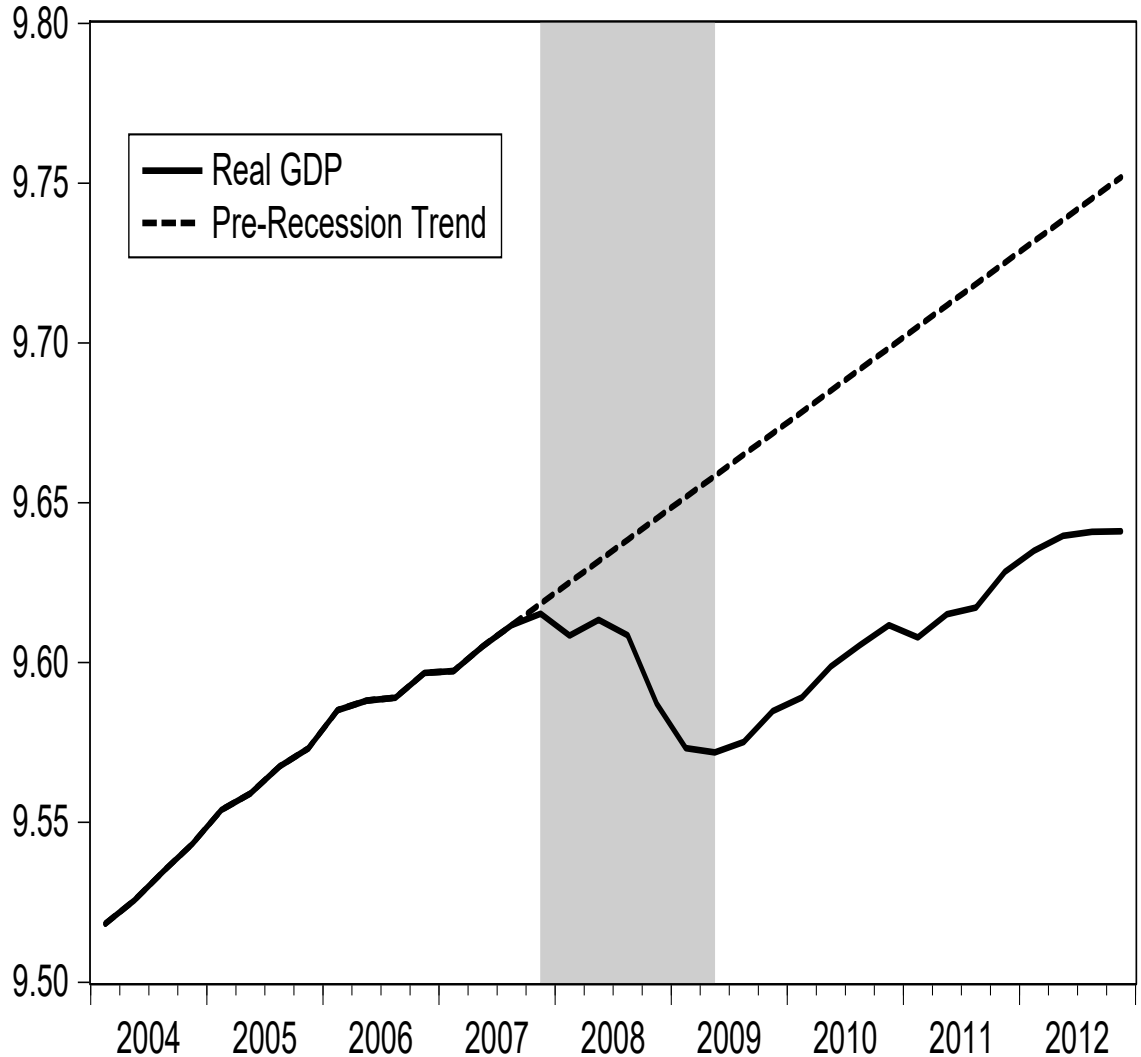
Stage 3: Intensification of Financial Crisis in 2008-2009



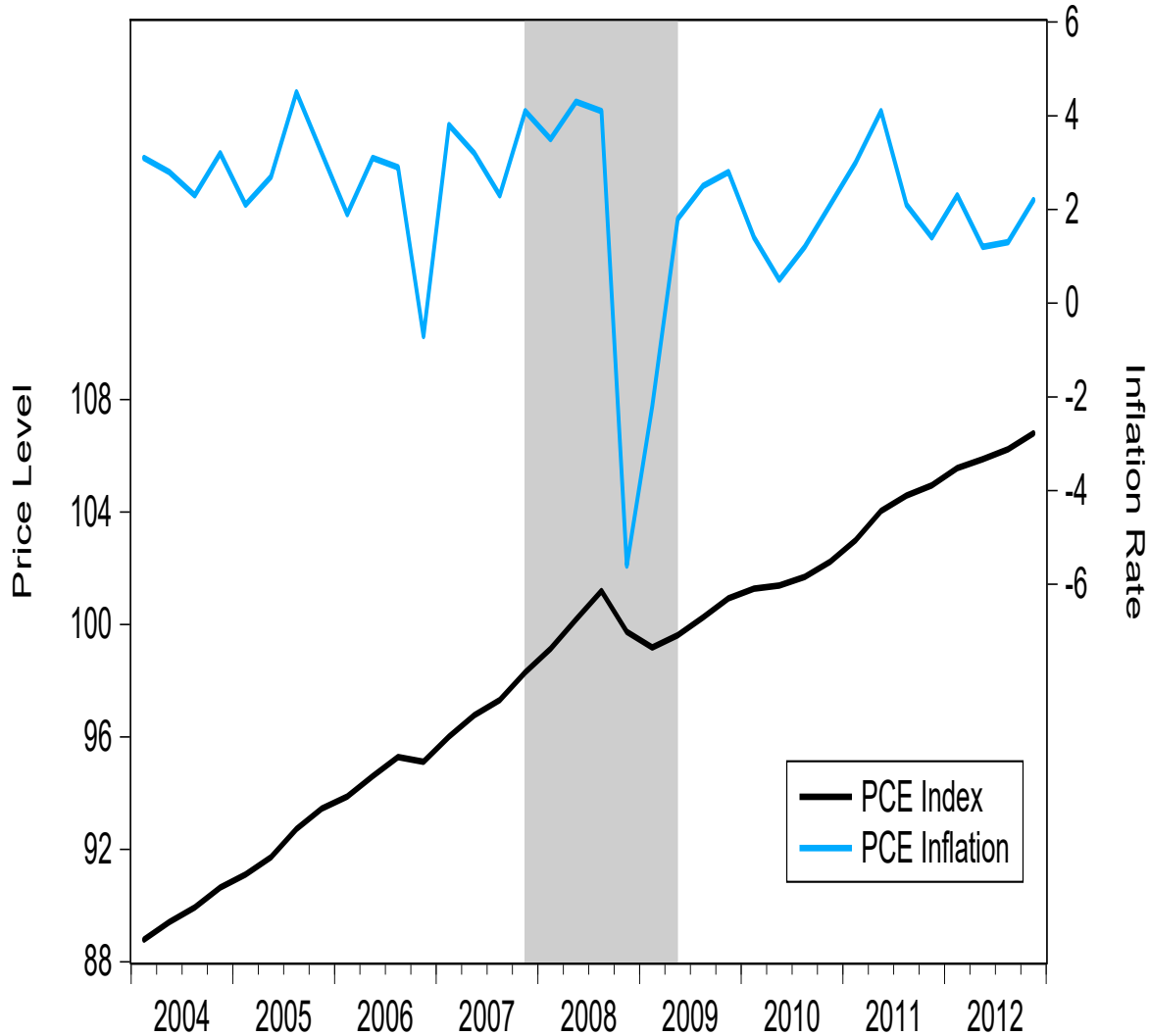
Model vs. Data

- The model does a pretty good job at capturing salient features of the data
- Timing fits nicely – house price declines preceded credit spread increases, and credit spread increases were greatest at the end of 2008 and into 2009 when the ZLB began to bind
- Model would predict: falling prices/inflation, large decline in output, and weak recovery due to ZLB
- More or less exactly what we see in the data

Real GDP Relative To Trend



Inflation and Prices



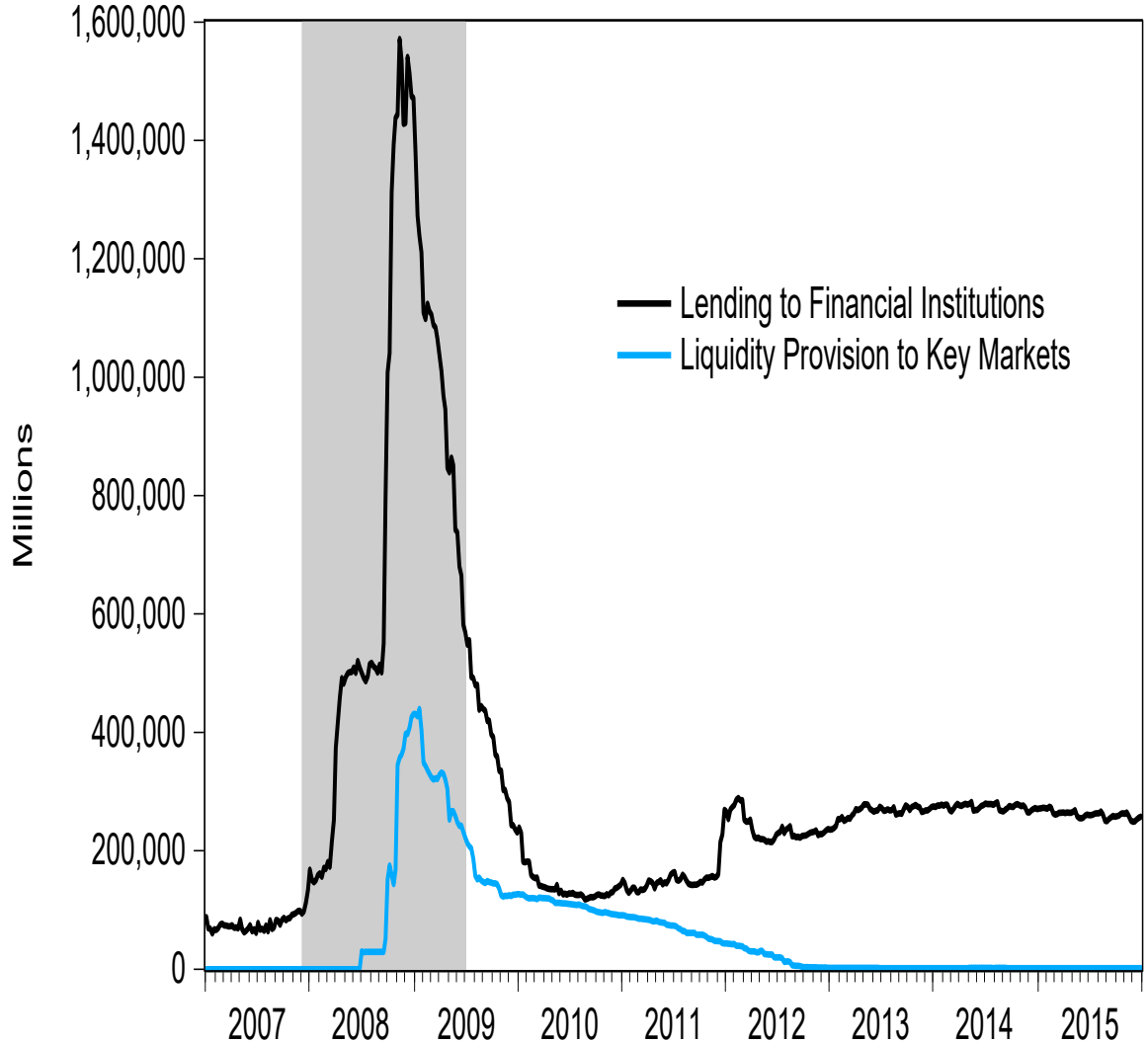
Policy Responses

- The Fed, in conjunction with the Treasury and Congress, responded to the crisis with a number of unusual policy actions
- However unusual, these policy actions all make a good amount of sense *in the context of the NK AD-AS model*
- Split policy actions into roughly three different areas:
  1. Emergency lending (lender of last resort)
  2. Fiscal stimulus
  3. Unconventional monetary policy
- Chronologically, policy responses also were undertaken in roughly this order

Lender of Last Resort

- The Great Recession was great because of a run on financial institutions
- Central banks were created to serve as a lender of last resort during runs
- The Fed failed at this during the Great Depression (Friedman and Schwartz 1971)
- Ben Bernanke (then Fed chair) to Friedman on the severity of the Great Depression: "You're right, we did it. We're very sorry. But thanks to you, we won't do it again."
- Emergency lending and liquidity provision to the financial system makes a lot of sense during a run
- What complicated things is that the institutions were not traditionally regulated banks
- Most emergency lending had dissipated by 2010

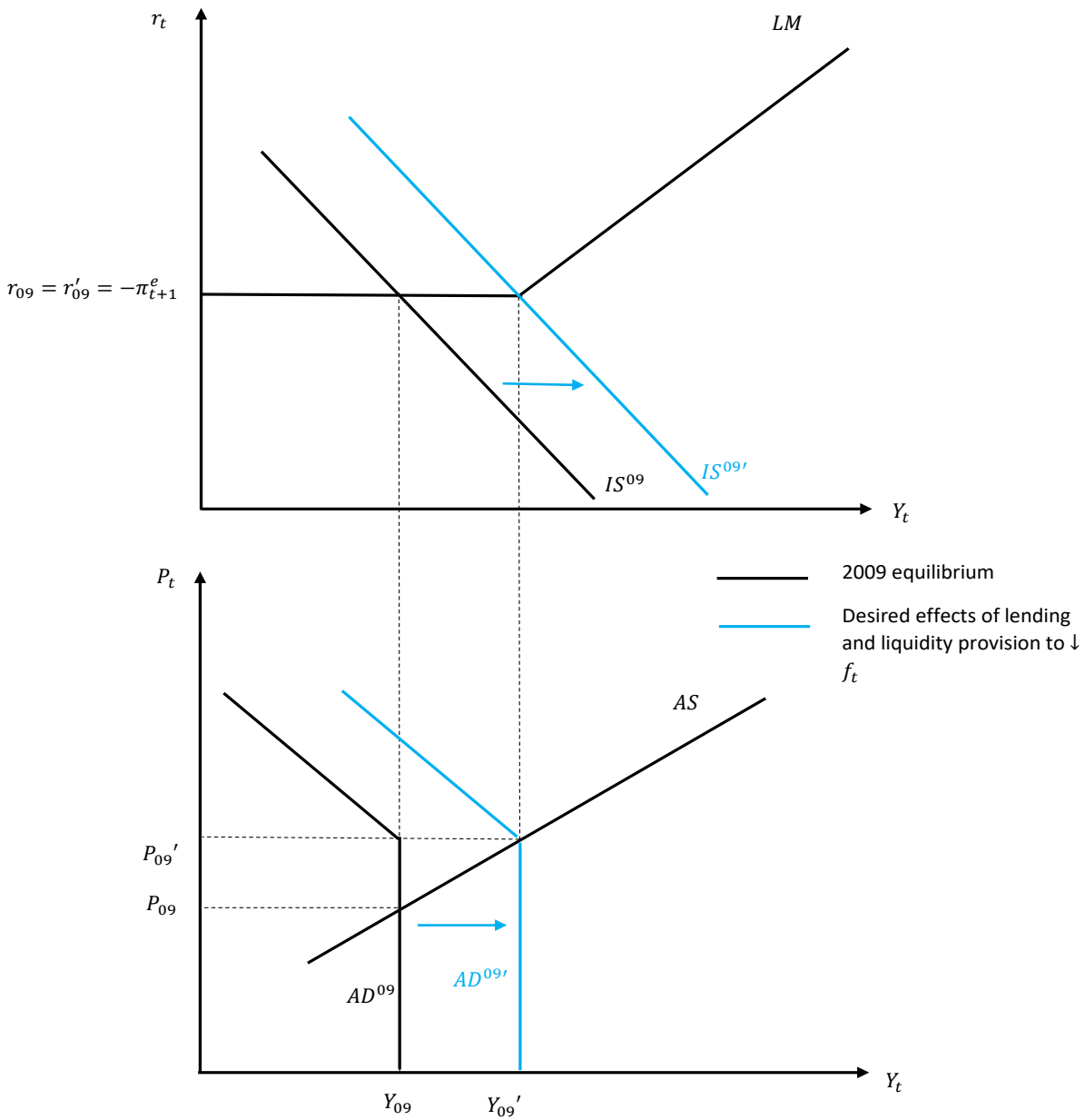
Emergency Fed Lending



Desired Effects of Fed Lending/Liquidity Provision

- By providing liquidity to the financial system, the Fed was trying to *reverse*/*stop* the run
- If it could stop the run, credit supply could increase, and f_t could decline
- In terms of $AD - AS$ model, we can therefore think about the desired effects of lender of last resort activities as trying to reduce f_t and stimulate investment demand

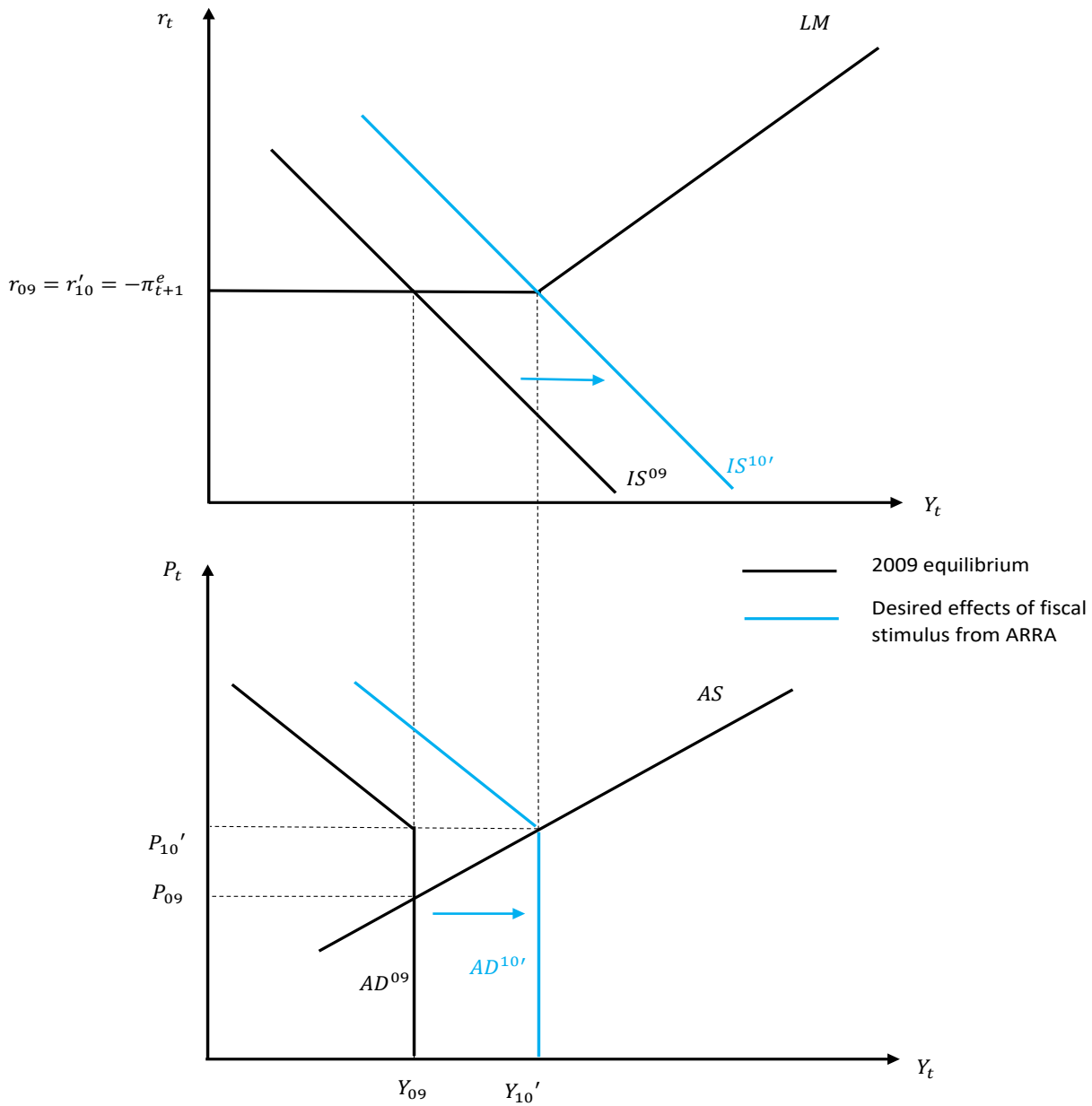
Desired AD-AS Effects of Lender of Last Resort Actions



Fiscal Stimulus

- American Recovery and Reinvestment Act (ARRA): passed in early 2009
- Designed to inject roughly $800 billion in stimulus (combination of spending increases and tax cuts) over a ten year period
- Think of this as designed to shift the *IS* curve and hence the *AD* curve
- As discussed, during circumstances in which ZLB binds and conventional monetary policy is ineffective, there is some logic to this
- Some thought this wasn't large enough, and others noted that state and local government spending declined

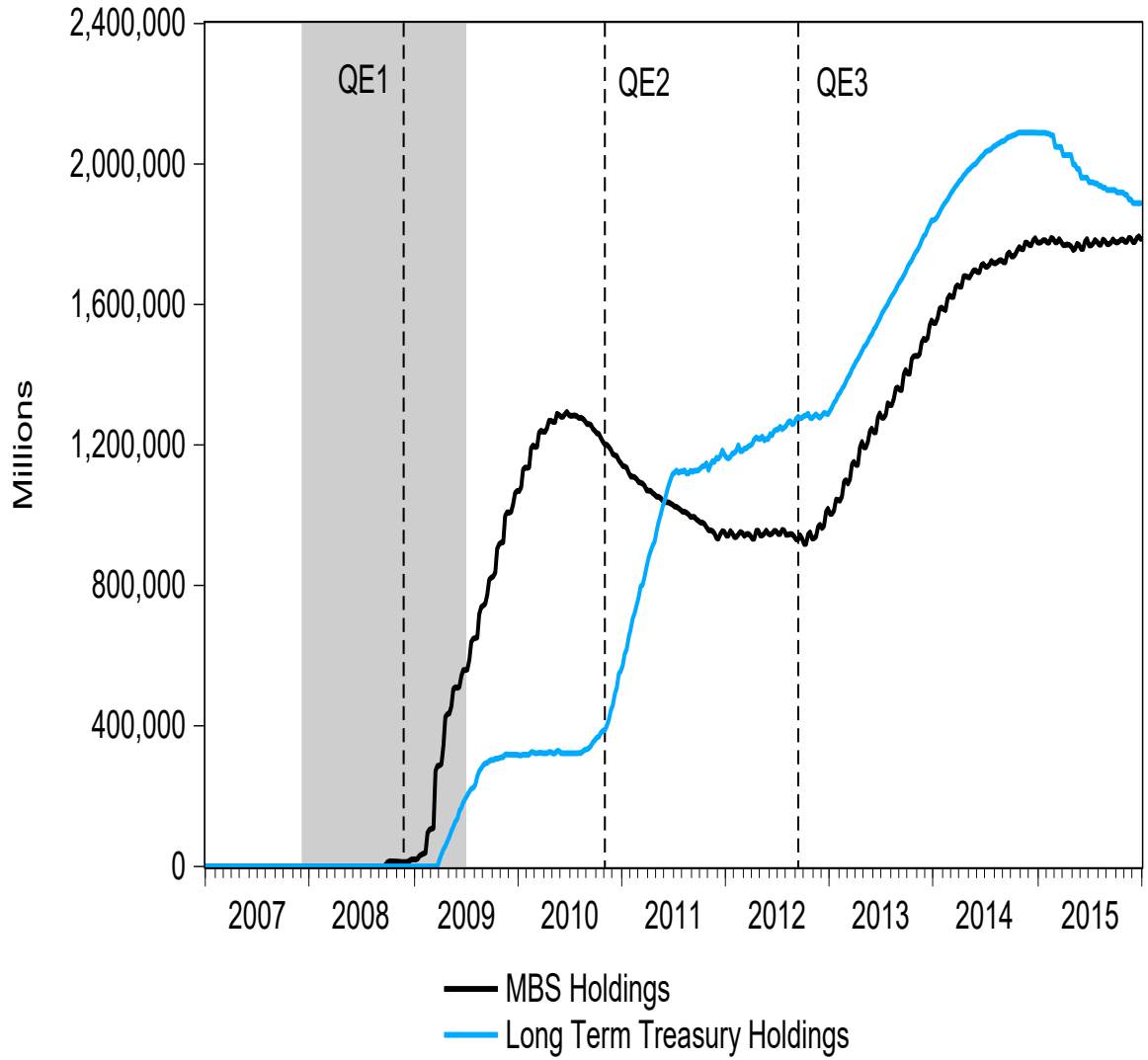
Desired AD-AS Effects of Fiscal Stimulus



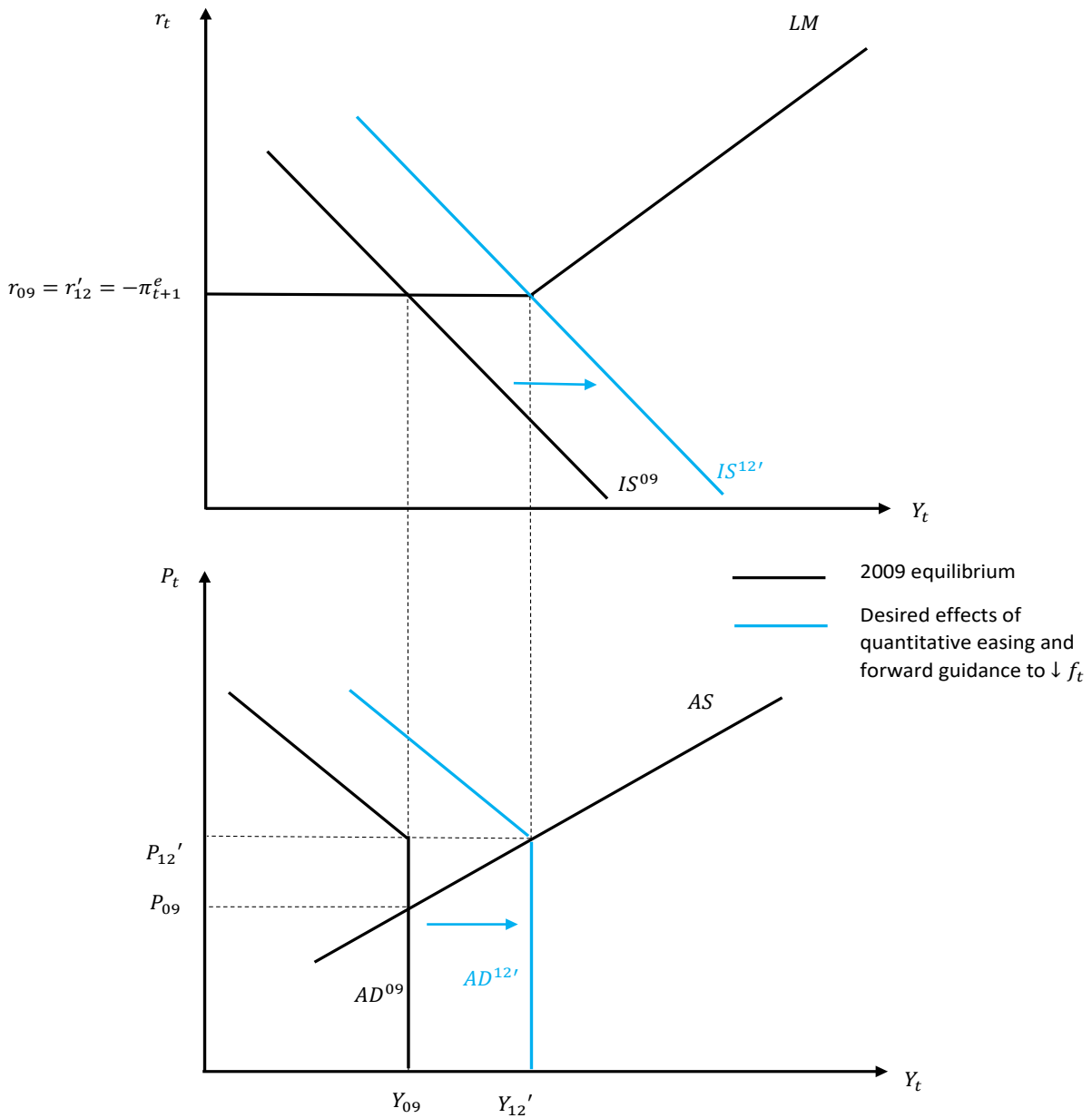
Unconventional Monetary Policies

- Conventional monetary policy: adjust the monetary base / money supply to adjust short term interest rates, which feeds into the myriad relevant interest rates for economic activity
- At ZLB this conventional tool is no longer available
- Two basic types of unconventional policy:
  1. Quantitative Easing: buy large quantities of "non-traditional" debt (private sector mortgage related debt and longer maturity Treasury debt). Idea is to push up bond prices and yields down. Effectively trying to reduce f_t
  2. Forward Guidance: telegraphing intended path of future short term interest rates. Basic idea: longer term interest rates are something like an average of expected path of short term rates (expectations hypothesis).
- Easiest way to think about unconventional policy tools is trying to affect r_t^l by lowering f_t (spread) rather than r_t (short term riskless rate)
- Can also think about these policies as trying to stimulate expected inflation (particularly so for forward guidance)

Unconventional Asset Holdings of Fed



Desired AD-AS Effects of Unconventional Policy



Did the Unconventional Policies Work?

- Very difficult to say – hard to construct the counterfactual
- What we do know – the Great Recession was not *nearly* as bad as the Great Depression
- That being said, the economy remained relatively stagnant for a number of years
- Effects have been quite *persistent* relative to a hypothetical pre-recession trend

Did Policies Work?

- Financial market intervention:
  - Indicators of financial stress went back to normal levels in 2009
  - Stock prices and risky bond spreads are basically back to where they were
  - Financial system didn't blow up
- Non-standard monetary policy:
  - Haven't had deflation, but inflation expectations haven't risen
  - Commercial banks sitting on lots of cash
- Fiscal stimulus:
  - Probably wasn't big enough to do an enormous amount anyway
  - Raised government debt and policy related uncertainty
  - Little consensus within empirical literature on effects of stimulus

Issues Going Forward

- US government debt as a fraction of GDP is high
- Fed's balance sheet is both much larger than previously and different composition
- Fed plays an increasingly important role in regulating and supervising financial institutions
- Is there a moral hazard problem – institutions believe they will be bailed out and misbehave, sowing seeds of the next crisis?
- Short term interest rates remain very low – will ZLB be a problem again in the future?
- Relatedly, inflation remains low relative to what the Fed would like
- These are issues for more advanced courses and research!