The Great Recession: Earthquake for Macroeconomics

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Objective

• Discuss the Great Recession, 2007-?

• What caused it, what made it last so long?

• Why did people (including macroeconomists) not predict it?

• What impact is it having on Macroeconomics as a discipline?

• Macroeconomics

  • The branch of economics concerned with understanding the behavior of the economy as a whole.
  • Principle focus: periodic ups and downs in aggregate economic activity.
    • Business cycles
Great Recession

• Big, by post World War II standards.

<table>
<thead>
<tr>
<th>The 2007-2009 Recession in Perspective</th>
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<tbody>
<tr>
<td>Output</td>
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<tr>
<td>Percentage change, peak to trough</td>
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<tr>
<td>2007-2009 Recession (2007 Q4-2009 Q3)</td>
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<td>Average Post WWII Recessions</td>
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<td>US Great Depression (1929 to 1933)‡</td>
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‡ Christiano-Motto-Rostagno (2003)

Smaller than Great Depression.
Great Recession

• Although the NBER business cycle committee declared the recession over in summer 2009, not clear that it really stopped then.
GDP per person (adjusted for inflation)
More Evidence that We’re not Really out of the Woods Yet: Labor Market
Recent recovery quite modest

Demographics?

May 2015

Source: US. Bureau of Labor Statistics
Shaded areas indicate US recessions - 2015 research.stlouisfed.org
Acceleration in decline at ‘end’ of Great Recession

Demographics?
Labor market...

• Categories:

  • Labor force, \( L = E + U \)
    
    • Employed, \( E \).
    • Unemployed (interested in working, but haven’t found job), \( U \).

  • Not in the labor force: people not in \( L \).

• Unemployment rate: \( u = U/L = 1 - E/L \).

• I measure \( L, E, U \) relative to population.

  • E.g., \( E \) is ‘employment to population ratio’.
Unemployment rate: this time it was different

• Traditionally, the unemployment rate is used as a measure of the health of the labor market.

• Historically, when $u$ falls, it’s an indicator that more people are being put to work, i.e., $E$ is increasing.
Decline in $u$ primarily reflected fall in $L$!

$$u = 1 - \frac{E}{L}$$
Unemployment rate

• Another indicator that fall in unemployment rate is not a perfect indicator of improved functioning in the labor market.

• Ask each person in $U$, ‘how long have you been unemployed?’

  • Compute average over all answers to the question:

    Mean duration of unemployment.
The amount of time spent unemployed is greater, by far, than it has been at any point in the past 70 years.
Job Openings and Labor Turnover Survey

• More evidence of dysfunction in the labor market.

• My late 2012, vacancy rate was back to where it was before recession, but unemployment rate was still high.

  • Seemed like the jobs were there, it’s just that the American worker was no longer qualified.
Questions

- What was the trigger for the Great Recession?

- What made it last so long?

- A variety of hypotheses were advanced.
  - Now a consensus seems to be taking shape.

- But first,
  - discuss some ideas that were advanced initially, but seem less appealing now.
Initial Responses

• Initially, there was much puzzlement over what was happening (more on this later).

• A couple of initial answers:

  • Firms have lots of job openings, it’s just that workers don’t have the right qualifications. **Skills mismatch hypothesis.**

  • Firms hesitate to hire more workers because they are uncertain about future taxes and regulations. **Uncertainty hypothesis.**
President of Federal Reserve Bank of Minneapolis, on ‘Mismatch Hypothesis’ (8/17/2010)

• “Firms have jobs, but can’t find appropriate workers. The workers want to work, but can’t find appropriate jobs.”

• “Whatever the source [of this mismatch] it is hard to see how the Fed can do much to cure this problem.”

• “Most of the existing unemployment represents mismatch that is not readily amenable to monetary policy.”

Mismatch Hypothesis Does Not Hold up in Data

• Major problem for the mismatch hypothesis:
  
  • *All* types of workers are having difficulty finding work:

  • Unemployment rate jumped for workers of different occupations and education levels.

• Source: Heidi Shierholz: http://www.epi.org/publication/shortage-skilled-workers/
Unemployment rate higher for workers at all education levels. Nearly doubles for higher education levels.

**Figure 1: High unemployment at all levels of education relative to 2007**

Note: Due to the fact that the data are not seasonally adjusted, 12 month averages are used. The last 12 months consist of data from August 2012 to July 2013.

*Source:* Author’s analysis of Current Population Survey microdata
Figure 2: High unemployment in all occupations relative to 2007

Unemployment rate in 2012
Unemployment rate in 2007

Source: Authors’ analysis of basic monthly Current Population Survey microdata
Mismatch Hypothesis Does Not Hold up in Data

• If the reason firms are not hiring is that they can’t find the right workers, then the workers they do have should be working *harder*.

  • But, hours worked is down across almost all industries.
Figure 4: No evidence of hours being ramped up
Weekly hours in 2012 relative to 2007, by occupation

Source: Author's analysis of basic monthly Current Population Survey microdata
Averaging across all workers, we also see no evidence of an increase in average weekly hours relative to before the start of the recession.
Mismatch Hypothesis Does Not Hold up in Data

• If what’s holding firms back from hiring is the inability to find the right type of workers, then the wage of some types of workers (the ‘right types’) should be skyrocketing.

• But, wages across lots of occupations are rising at pretty modest rates.
Figure 5: No evidence of wages being bid up
Real average hourly wages in 2012 relative to 2007, by occupation

Amount by which the average worker's output increased from 2007 to 2012

More problems with mismatch

• If skills required for work increased substantially, should see it in the labor productivity data.

• The people that are working should be especially productive.

• Don’t see this in the data.
Overall recent trend in labor productivity growth seems down.
Mismatch Hypothesis Does Not Hold up in Data

• Another way to test mismatch hypothesis:

  • Ask firms!

• Since the early 1970s, the National Federation of Independent Business, a small business association, has surveyed its members to find out what their ‘top problem is’.

• They are asked to select from among the following 10 categories:

  • Taxes, Inflation, Poor sales, Finance & interest rates, Cost of labor, Government regulations & red tape, Competition from large businesses, Quality of labor, Cost/availability of insurance, Other.
Poor sales has been the big problem, not quality of labor.

For the NFIB survey, firms were given a list of 10 possible ‘single most important problems’. The numbers in the chart report the percent of firms listing the indicated problem as the most important. The chart reports results for only four of the 10 possible candidates for the ‘single most important problem’. The other six possible problems were chosen less often than ‘poor sales’. See http://www.nfib.com/Portals/0/PDF/sbet/sbet201502.pdf
Another Hypothesis: Bad Government

• Policy uncertainty and too much regulation*.

• Baker, Bloom and Davis construct a measure of economic policy uncertainty.
  
  • Their indicator came down to pre-recession levels by November 2012
  • No big pickup in employment after that, suggesting that was not a major factor holding firms back.

• Respondents to NFIB survey assign a lower rank to regulation as a reason for not hiring more workers.

*See: http://www.minneapolisisfed.org/research/wp/wp694.pdf
‘Government regulations & red tape’ was well below ‘poor sales’ as principle concern until 2013. Then, the number listing it as the main concern began to exceed poor sales as the top problem (see chart on earlier slide).
• The Great Recession is indeed *Great*

• Mismatch, uncertainty and bad government policy hypotheses
  • seem unlikely either as a major cause or source of propagation of the Great Recession.

• I have not mentioned the idea that the Fed caused the Great Recession by keeping interest rates too low in the pre-2007 period.
  • This hypothesis also seems not to command much agreement.
  • See, e.g., Bernanke (http://www.brookings.edu/blogs/ben-bernanke/posts/2015/04/28-taylor-rule-monetary-policy) for discussion.

• The behavior of labor force participation is puzzling, and deserves greater attention.
  • See, e.g., Christiano-Eichenbaum-Trabandt, AEJM, 2015.

• Bottom line: Great Recession looks like a classic *demand-shock recession*.
  • Low output and low inflation.
  • But, what is the source of the demand shock???
The Big Questions Remain

• What caused Great Recession, why has it lasted so long?

• Why did people (including macroeconomists) not predict it?

• What impact did it have on Macroeconomics as a discipline?
Sketch of Emerging Conventional Wisdom

• Immediate Cause of Great Recession:
  • A classic 19\textsuperscript{th} century-style run on the US banking system (Gorton).
    • The run was triggered by the collapse of the housing bubble.
    • Damage to financial system contributed to collapse in investment spending.

• The banking crisis was over by the end of 2009. Why did the recession continue?
  • A substantial number of households felt very poor because of the reduction in house prices.
  • These households chose to cut back on consumption in the hope of increasing saving (Mian and Sufi).

• The binding zero lower bound on the interest rate transformed the reductions in consumption and investment into a drop in GDP.
  • With a big enough fall in the interest rate, employment and GDP could have been insulated from the shocks to consumption and investment.
This is what a bank run looked like historically.

This time, bank runs were invisible to most people (Gorton).
The Drama of the Bank Runs Brought to Life in Some Great Movies!
Banking Crisis, the ‘The Panic of 2007’ (Gorton)

• What is a bank?
  • Borrows short run and lends long run (‘maturity mismatch’)

• Example:
  • bank takes a $1 deposit and promises to repay $1 in one period.
  • It lends the money to a firm, which promises to pay the $1 back in two periods (zero interest!)

• The bank obviously cannot in fact repay the deposit in one period.
  • It counts on the depositor ‘rolling over’ the loan after one period.
  • Alternatively, the bank must find another lender if the first lender doesn’t want to roll over.
  • Bank ‘run’: when a bank cannot roll over a deposit or find another lender.

• Why might a bank run occur?
  • Depositors know that if bank cannot get funding, then the bank must sell loan at a loss.
  • In that case, depositors cannot get all their money back.
  • Thus, if depositors think there will be a run, it’s in their interest to run now: CRISIS!
But, how can there be a bank run when there is deposit insurance?

• The deposits of commercial banks are insured.
  • As a result, there is never a run on a commercial bank.

• The runs occurred in the Shadow Banking System.

• As the name suggests, the shadow banking system is living in the shadows.
  
  • Data on financial firms is a byproduct of regulation.
  • Shadow banks lightly regulated and so not much was known about them.
  • Little was known about them by politicians, journalists, academics and even policymakers.
How and why did the shadow banking system come into existence?

• Shadow banks were a way to avoid regulation while maintaining some protection from the Fed.

• Federal reserve policymakers sort of knew about the existence of the shadow banks, but they looked the other way.

  • This was in part because of the prevailing mood of the time, that regulation stifles creativity.

  • Fed Chairman Greenspan famously believed in the power of financial markets to regulate themselves. Later, he recanted (see http://www.nytimes.com/2008/10/24/business/economy/24panel.html)

  • The preference of the shadow banking system for mortgage securities dovetailed with political priorities that favored getting low income households into housing (Rajan).
Example of a Shadow Bank: A Structured Investment Vehicle (SIV)

• Suppose a commercial bank makes a mortgage loan of $100 to someone. This is called a loan origination.

• Long ago, the mortgage would have stayed on the commercial bank’s books.

• Before the crisis they would sell a whole portfolio of mortgages to an SIV.

  • The SIV would pay for the mortgages by issuing short-term securities, which people bought thinking they were risk free.
  • Asset-backed securities (ABS), asset-backed commercial paper (ABCP).
  • SIV’s made huge profits because they had an implicit promise from originating bank to buy back the mortgages in case they went bad.
  • The promise was credible because the originating bank had the Fed standing behind it in case of trouble.
The Panic of 2007

- Housing prices began to soften and then fall in 2006.
  - There was a real concern that so-called subprime mortgages would go bad.
    - Policymakers were relatively unconcerned because subprimes totalled only $1 trillion.
    - What no one appreciated was the size of the shadow banking system and its vulnerability to runs.
  - Holders of asset-backed commercial paper (ABCP) became skittish.
    - Much easier to withdraw funds than to carefully determine the safety of the ABCP.

- July 30, 2007 a German bank, IKB, announced that it required emergency funding.
  
  - Problem: its off-balance-sheet vehicle (‘Rhineland’) was not able to roll over the asset-backed commercial paper (ABCP) it had been issuing in US markets to fund its large portfolio of US mortgages.
  - Although none of the mortgages in the Rhineland portfolio was in default and only some were subprime-related, Rhineland creditors decided not to roll.
  - This created a crisis for IKB because its reputation would suffer if it didn’t stand by Rhineland.
Issuance of ABCP abruptly stopped in summer, 2007, as part of the bank run.
Where did all the money come from?

• The shadow banking system expanded a lot more than anyone knew at the time.
  • It was getting a lot of money from somebody.
  • From who? Certainly not only from Americans.
  • Answer: Global Savings Glut (Bernanke).

• Why was so much going into mortgages?
  • Suggested answer: Banking Glut (Hyun Shin).
Americans have been absorbing more goods than they produce for many years.
US Current Account Deficit

• Americans are net importers of goods.

• Balance of payments:

Current account + financial account = 0

• Which countries is America exporting financial claims to?
Growing US current account deficit primarily against Asia and Oil Exporters.

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<tr>
<th></th>
<th>1995</th>
<th>2002</th>
<th>2005²</th>
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<tbody>
<tr>
<td>United States</td>
<td>-114</td>
<td>-475</td>
<td>-759</td>
</tr>
<tr>
<td>Euro Area</td>
<td>49</td>
<td>49</td>
<td>24</td>
</tr>
<tr>
<td>Asia</td>
<td>72</td>
<td>244</td>
<td>341</td>
</tr>
<tr>
<td>Japan</td>
<td>111</td>
<td>113</td>
<td>153</td>
</tr>
<tr>
<td>China</td>
<td>2</td>
<td>35</td>
<td>116</td>
</tr>
<tr>
<td>Major Oil Exporters¹</td>
<td>8</td>
<td>92</td>
<td>398</td>
</tr>
</tbody>
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Source: IMF
Why the big imbalances?

• Hypothesis #1: Americans are greedy and lazy.
  • They consume more than they produce, send IOU’s to foreigners.
  • Current account drives the financial account.

• Hypothesis #2 (Savings Glut): Foreigners are hungry for US financial assets.
  • Financial account drives the current account.

• Simple Mundell-Fleming reasoning behind hypothesis #2.
  • Foreigners love US assets, so they buy them in large numbers.
  • Causes dollar over-valuation, driving US trade balance into deficit.
  • US interest rates drop as asset prices bid up by foreigners.

• Hypothesis #1 implies US interest rates rise as greedy Americans try to induce people to lend to them.
Hypothesis #2 (Savings Glut Hypothesis) wins by a wide margin.

Why did so much money go into mortgages?

• One answer suggested by Hyun Shin and others.

• Recall that the Euro Area current account is roughly balanced.
  • On net, financial flows between the US and EA balanced.

• But, the gross flows between US and EA are huge and of a particular type.
  • In particular, European banks have been buying mortgages in US financial markets and financing them by issuing ABCP in the US markets.
  • Recall Rhineland and IKB.
Consistent with idea that housing purchases being funded by Inflow of foreign capital corresponding to current account deficit.
Summary of Analysis so Far

• The analysis just described bears a strong similarity to analyses of emerging market crises in 1990s and earlier.

• Foreigners get all excited about a group of emerging market economies.
  • Financial capital pours into that economy.
  • Big current account deficit.
  • Regulatory controls break down.
  • Stuff goes wrong.
  • Foreigners run away, leaving the country in a shambles.

• There are *some* differences.
  • America’s obligations denominated in dollars (no currency mismatch issues).
  • The demand for the obligations of the local government (i.e., US government) soared. Indeed, one could argue there is a US debt crisis because there is not enough US government debt to satisfy world demand.
Banking crisis is not the whole story.

Crisis appears to be over by summer, 2009, but economy remains weak for years.
Rest of the story

• Weak consumption by homeowners that felt poor as a result of drop in house values.

• They had bought their house for two reasons:
  • Nice place to live
  • Planned to sell it when old, and then downsize and use the capital gains to retire.
  • Part 2 of the plan died with the housing bust, so households had to start saving.
Mian and Sufi cross-state evidence that fall in house value led to cutbacks in spending.
Zero Lower Bound

• Just because one group of people cuts back on spending does not mean you have to have a Great Recession.

• In a well-functioning market economy, interest rate should drop to encourage someone else to spend.

• If someone else does not expand spending, a recession will occur.

\[ GDP = C + I + G + NX \]

• The fact that the interest rate hit the zero bound, prevented the operation of this healing force.
Why did no one (including macroeconomists) predict the Great Recession?

• No one was paying attention to the shadow banking system.

• Most people thought intermediation went through the commercial banks regulated by the Fed, or through ordinary bond and equity markets.

• This ‘normal’ financial system seemed perfectly safe.
  • There had been relatively little fallout from the stock market collapse of 1987, the savings and loan crisis, or the ‘dot-com bust of the early 2000s’.
  • Bank runs and crises like in the 19th century seemed out of the question.
  • If anything, the economy seemed to be in a very boring period, the Great Moderation.

• In the Panic of 2007, most people had never heard of the markets that were involved.
  • Indeed, many were quite puzzled because while Bernanke and Paulson were warning about the potential imminent failure of the ‘banking system’, the one banking system we had good data on seemed to be doing quite well.
  • The ‘shadow banking system’ was not on anyone’s radar.
  • Even someone as astute as Ben Bernanke acknowledges that he vastly underestimated the systemic risks posed by the shadow banking system.
Implications for Macroeconomics

• The Great Recession was a consequence of a massive demand shock.
  • Nothing happened to the supply side of the economy.
  • Shock to investment (residential and non-residential) and consumption.
  • We need a framework in which demand shocks have real effects.

• Under this view, the New Keynesian model is attractive as a platform.
  • With sticky prices, demand shocks can have a big effect, particularly if the zero lower bound becomes binding.

• But, the New Keynesian model needs fleshing out.
  • Fortunately, it is an excellent platform to build on.
What’s to be done?

• The labor market side of the NK model needs improvement.

• An important policy debate erupted during the Great Recession:
  • Should we extend unemployment benefits?
  • Will they make the recession more severe by subsidizing unemployment?
  • Or, will they have no effect on employment and just make the life of unemployed people more bearable?
  • The NK model cannot address this policy question, but advances are being made that will allow the model to do so (my June 8 seminar).

• Labor force participation moved in an anomalous way during the Great Recession.
  • Need models that can address this.
  • These are under construction (my AEJM 2015 paper).
Financial Side of the NK Model

• A number of challenges present themselves.

• Need a model of the banking system that incorporates the shadow banking system and bank runs (see, e.g., Gertler-Kiyotaki-Prestipino 2015).
  • My student, Xueting Wen, is building a version of GKP that can be estimated on Chinese data. Her model is designed to capture the Chinese state-owned banks and shadow banking systems.

• Use the model to contemplate macro prudential policy.
  • Christiano-Ikeda (2015), is an example of an estimable business cycle model being used to investigate what are the optimal capital requirements on banks and how should those requirements be varied over the business cycle.

• The Fed and Treasury undertook various policies that seemed to produce good results (at least, we didn’t have a second Great Depression!)
  • The Fed replaced part of the private intermediation system by acquiring massive amounts of private assets.
  • Much progress has been made in developing models that can be used to think about this (Gertler-Kiyotaki, Christiano-Ikeda, 2013, 2014).
The Future

• Integrating finance and labor market frictions into dynamic models requires whole new kinds of training.

  • Finance - must master the various types of agency problems in intermediation
    • Adverse selection, hidden effort, asymmetric information and costly verification, running away.

  • Labor markets – the labor literature is huge and exploding as we speak.
    • Bargaining, dynamic models of insurance….hard stuff. Lots to be found in the labor literature.

• What I see in macro seminars and conferences in recent years is completely different from what I saw before the crisis.
  • The difference is so big, it feels as though we’ve all been struck by an earthquake.
  • Hence, the title for my presentation.
Fun!

• Example: I took a NK model with financial frictions to US macroeconomic data, and came away with a completely different conclusion about what the source of shocks is.

• The model has shocks that arise in the financial system, and the paper concludes that 60% of the business cycle fluctuations in US and EA GDP since mid-1980s are due to that shock.

• The shock drives out all the standard macroeconomic shocks.

• When the data are viewed through the lens of a financial friction model, get very different answers to basic questions.

The big picture?

• Arguably, macroeconomics was born in the 1930s, in the horror of the Great Depression.
  • That is when the national income and product accounts (NIPA) were developed.

• Keynesian economics was organized around the NIPA accounts.
  • It’s a vision under which market economies work pretty well much of the time.
  • But, sometimes they can lapse into dysfunction, when government intervention may be helpful.

• The history since the 1930s, particularly with the rational expectations revolution, is one of constantly improving the micro foundations of the framework initially sketched by Keynes.
  • A macro economy has lots of moving parts.
  • Micro foundations verifies that they are all moving together sensibly.

• In recent years, that framework entered another growth spurt.