The Great Recession—How Bad Is It and What Can We Do?

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Recession Facts

• 10 U.S. recessions with average length 10 months since 1945
• Average length is 17 months including the 22 additional recessions since 1854
• Normally hits production, employment, real income, and other measures of economic activity
Chicago Fed National Activity Index, Three-Month Moving Average (CFNAI-MA3)
Real Durables Consumption & Vehicle Sales

Percent change

Millions of vehicles, annual rate

6 — 20
4 — 18
2 — 16
0 — 14
-2 — 12
-4 — 10
-6 — 8

Autos and Light Trucks
(right scale)

Durables (bar)
(left scale)

2007 2008 2009
Commercial Paper Outstandings
(Weekly, seasonally adjusted)
It’s not just the U.S.A.

- IMF is predicting first decline in world growth in 60 years, $-\frac{1}{2}$ percent

- Rich and poor countries alike are suffering

- Production and labor market effects differ across countries
Percentage of Countries in Recession

Year of U.S. Recession

Percent

Two-Period Decline GDP
ECRI-Defined Recession
2007-2009: A World Recession

Dark Red: Countries in official recession (two consecutive quarters)
Light Red: Countries in unofficial recession (one quarter)
Dark Orange: Countries with economic slowdown of more than 1.0%
Light Orange: Countries with economic slowdown of more than 0.5%
Pink: Countries with economic slowdown of more than 0.1%
Blue: Countries with economic acceleration
Gray: N/A

(Between 2007 and 2008, as estimates of December 2008 by the International Monetary Fund)
Global recessions
Apr 30th 2009
From The Economist print edition

• Before this year the world economy had been in recession on four occasions in the past half century, if recession is defined as a drop in output per person. An analysis in the IMF’s latest World Economic Outlook shows that, when exchange-rates are measured using purchasing-power parity, world output dipped sufficiently to drag down average output per person in 1975, 1982 and 1991. But on virtually every measure, this year’s downturn is much deeper than previous troughs. Global output per head is set to fall by 2.5% this year, compared with an average of 0.4% in the previous global recessions. Global trade is set to shrink by almost 12%. In previous global recessions trade merely stagnated.
Global recessions
% change

- Total trade
- Industrial production
- Capital flows
- GDP* per person
- Oil consumption
- Unemployment†

Source: IMF  *PPP weighted  †Percentage point increase
Some Perspective: Depressions versus Recessions

• A search on the internet suggests two principal criteria for distinguishing a depression from a recession: a decline in real GDP that exceeds 10%, or one that lasts more than three years.

• *The following chart shows The Economist’s* ranking of slumps in developed and emerging economies over the past century. It excludes those during wartime (both Germany and Japan, for example, saw output plunge by 50% or more after 1944). The depressions in Germany and France in the 1930s make it into the top 12, but not that in Britain, where GDP fell by a relatively modest 6%.
## The dirty dozen

<table>
<thead>
<tr>
<th>Country</th>
<th>Years</th>
<th>US real GDP % change from previous year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>1989-98</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>United States</td>
<td>1929-33</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>1981-85</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>Argentina</td>
<td>1998-2002</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>Poland</td>
<td>1978-82</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>Hungary</td>
<td>1989-93</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>Chile</td>
<td>1981-83</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>Venezuela</td>
<td>2001-03</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>Germany</td>
<td>1929-32</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1989-92</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>France</td>
<td>1929-32</td>
<td>[Graph showing data]</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1997-98</td>
<td>[Graph showing data]</td>
</tr>
</tbody>
</table>

Sources: IMF; OECD; Bureau of Economic Analysis

*Based on calendar-year data
Housing Markets

• What went wrong with mortgages?
• The good and the bad about subprime lending
• How widespread is it?
RISE OF MORTGAGE BOND MARKET

Outstanding mortgage-backed securities ($ billion)

*Q2

SOURCE: SIFMA
MORTGAGE BOND MARKET

Total: $6.8 trillion, 2007 Q2

SOURCE: Federal Reserve; Bank of England; SIFMA
Mortgage Debt in US

- $6.319 trillion total in 1999 in US
- $4.760 trillion in 1999 on 1-4 family homes
- Subprime is relatively new and not majority of lending any year
- Pictures can be misleading—watch units of charts (axes)
SUB-PRIME LENDING IN CLEVELAND METRO AREA
% home loans made by sub-prime lenders, 2005

- 0% – 9%
- 10% – 22%
- 23% – 38%
- 39% – 56%
- 57% – 100%

Cleveland boundary
 Neighbourhood and county boundaries

SOURCE: Case Western Reserve
GROWTH OF SUB-PRIME LENDING

Annual volume of sub-prime $bn % share of mortgage market

Loans)

Share

SOURCE: Center for Responsible Lending /Inside Mortgage Finance
Monthly Mortgage Default Rate

(Based on performance of all loans packaged into securities in 2006)

Value of Home Exceeds Loan

- Prime
- Alternative-A
- Subprime
- Option Adjustable-Rate

Loan Exceeds Value of Home

Default Percentage Per Month

(Percent of loans, when current market value of home is divided by current mortgage, that are in default)

- Amount Owed on All Mortgages on a Home Divided by Current Value of Home
Cumulative default rates for prime and subprime mortgages

A. Prime mortgages

B. Subprime mortgages

Note: Each year indicates the year of mortgage origination.
Source: Authors' calculations based on data from Lender Processing Services (LPS) Applied Analytics.
# Homeowners Qualifies for Mortgage Bailout

## Who Would Qualify

**Loan modification**

For homeowners who are having trouble making mortgage payments because their interest rate has risen or their income has shrunk.

<table>
<thead>
<tr>
<th>QUALIFY</th>
<th>DON’T QUALIFY</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Green Checkmark]</td>
<td>![Red X]</td>
</tr>
<tr>
<td>Have payments of more than 31% of pretax monthly income and can prove hardship</td>
<td>Aren’t about to default</td>
</tr>
<tr>
<td>Occupy a single-family home</td>
<td>Are an investor with a home that isn’t owner-occupied</td>
</tr>
<tr>
<td>Can prove the home is primary residence</td>
<td>Have a home that is vacant or condemned</td>
</tr>
<tr>
<td>Have an unpaid principal balance of $729,750 or less?</td>
<td>Have an unpaid principal balance of more than $729,750?</td>
</tr>
<tr>
<td>Have a mortgage originated on or before Jan. 1, 2009</td>
<td>Have a mortgage packaged into securities whose rules explicitly forbid modification</td>
</tr>
<tr>
<td>Make all modified payments over a trial period of three months or more</td>
<td>Have loan servicers who can’t be reached or are unwilling to consider modification</td>
</tr>
</tbody>
</table>

**Loan refinancing**

For borrowers who aren’t able to refinance, perhaps due to a decrease in the value of their home.

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<tbody>
<tr>
<td>![Green Checkmark]</td>
<td>![Red X]</td>
</tr>
<tr>
<td>Have loans owned or guaranteed by Fannie Mae or Freddie Mac</td>
<td>Have loans owned or guaranteed by a company other than Fannie or Freddie</td>
</tr>
<tr>
<td>Are current on mortgage payments</td>
<td>Have been more than 30 days late on a payment in the past 12 months</td>
</tr>
<tr>
<td>Can prove the ability to afford the new mortgage debt</td>
<td>Can’t afford the new mortgage debt</td>
</tr>
<tr>
<td>Mortgage balance of no more than 105% of current estimated home value</td>
<td>Home price has fallen so that the loan is more than 105% of the market price</td>
</tr>
</tbody>
</table>

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*Missed payments or current bankruptcy proceedings may not disqualify a borrower.

† On a first lien on a one-unit home.

Source: Treasury Department
Financial Crisis

• A disruption to financial markets in which adverse selection and moral hazard problems become much worse, so that financial markets are unable to efficiently channel funds to those who have the most productive investment opportunities (Mishkin 1991 NBER WP)
How did we get into this mess?

• Financial crisis 2007
  – February 2007: Freddie Mac announces it will no longer buy the most risky mortgage-related securities
  – June-December 2007: Bankruptcies, ratings downgrades, liquidity support in US, UK, France
  – Liquidity crisis from securitized mortgages . . .
Subprime Mortgage Crisis

- Mortgage-Backed Securities and Collateralized Debt Obligations
- Tranches and measuring risk
- Falling home prices
- Foreclosures
- Financial Market Problems
- Fannie Mae/Freddie Mac
- Monetizing public and private debt
Welcome to the Slippery Economics Casino

You have 3 options:

• Option 1: Don’t Play

• Option 2: Flip a coin; if heads you get $5 and if tails you lose $5

• Option 3: Flip a coin; if heads, you get $100 and if tails you lose $100
Case 1

• You may choose Option 1 (Don’t Play) or Option 2 ($5), but NOT Option 3.

• Hands: How many for Option 1?

• Hands: How many for Option 2?
Case 2

You may choose any option.

Hands: How many for Option 3?

Hands: How many for Option 2?

Rest for Option 1.
Case 3

You may choose any option, but you receive (or pay) 20% of the amount stated.

- Hands for Option 3 (Win/Lose $20)?
- Hands for Option 2 (Win/Lose $1)?
- Rest for Option 1.
Case 4

You may choose any option, but you receive (or pay) 5% of the amount stated.

• Hands for Option 3 (Win/Lose $5)?

• Hands for Option 2 (Win/Lose $0.25)?

• Rest for Option 1.
Case 5

You may choose any option, but you receive 5% of the amount stated or pay $0.

• Hands for Option 3 (Win $5/Lose $0)?

• Hands for Option 2 (Win $0.25/Lose $0)?

• Rest for Option 1.
Normal economics behavior (responding to incentives) means people will move from no-risk Option 1 and low-risk Option 2 to high-risk Option 3 as we move from Case 1 to Case 5. The reasons are:

- Regulation
- Leverage
- Moral Hazard.
Regulation

• The changes from Case 1 to Case 2 indicate the effect of regulation (not allowing certain risky behaviors).

• Risk lovers will select Option 3 when they are allowed to do so, but the risk-averse will stay with lower-risk Option 2 or no-risk Option 1.
The changes from Case 2 through Case 4 show the effects of higher degrees of leverage (your money at risk is only part of the whole risk).

- Higher leverage means less of your money at risk, so your potential loss is lower.

- Higher leverage means people are willing to play the riskier options (Options 2 and 3).
Moral Hazard

Movement from Case 4 to Case 5 indicates the effects of *moral hazard* (perverse or incorrect incentives).

- If there is no way to lose because someone will cover your losses (or bail you out) then any real risk is gone.
- Most people will select Option 3.
### Regulated Insurance Company

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
<td>$1,000 m (quality/type regulated)</td>
</tr>
<tr>
<td>Debt (Liabilities)</td>
<td>$ 750 m</td>
</tr>
<tr>
<td>Equity/Capital</td>
<td>$ 250 m</td>
</tr>
</tbody>
</table>

Debt/Equity Ratio: 3:1

Company could withstand a 25% decline in the value of its assets.
Leverage: Playing with Other People’s Money 2.0

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
<td>$1,000 m</td>
</tr>
<tr>
<td>Debt (Liabilities)</td>
<td>$ 900 m</td>
</tr>
<tr>
<td>Equity/Capital</td>
<td>$ 100 m</td>
</tr>
<tr>
<td>Debt/Equity Ratio</td>
<td>9:1</td>
</tr>
</tbody>
</table>

FDIC-Insured Bank

Company could withstand a 10% decline in the value of its assets.
Leverage: Playing with Other People’s Money 3.0

Unregulated Investment Bank or Insurance Company

Assets: $1,000 m
Debt (Liabilities): $ 970 m
Equity/Capital: $ 30 m
Debt/Equity Ratio: 32:1

Company could withstand a 3% decline in the value of its assets.
Timeline: 1980s

• 1982: Savings and Loans were deregulated—allowed to lend outside home mortgages
• 1989: S&L collapse due to risky and fraudulent real estate deals.
• Federal government provides bailout.
Timeline: 1990s

• 1994: Hedge funds (unregulated) including Long-Term Capital Management (LTCM) start.

• 1998: Russian default on debt causes massive losses for LCTM leading to ~$3.6 billion bailout by federal government.

• 1999: Freddie and Fannie relax mortgage requirements to encourage home ownership.
Timeline: 2000-2004

- 2001: Fed lowers federal funds rate to 1% due to 9/11 and recessionary economy
- 2002: Housing market booms with EZ terms and low-cost credit
- 2004: Investment banks (ML, GS, LB, BS, MS) get SEC to allow leverage increase from 12:1 to 40:1 without any oversight. Mortgage bundling rises.
Timeline: 2005-2006

• 2005: Mortgage brokers offer riskier loans (0% down, “teaser” rates, sub-prime) to feed banks’ demand for mortgages. All share assumption: house prices will rise; mortgages are safe so shaky mortgages are easy to refinance.

• 2006: Investment banks create securities (CMOs) and buy bond insurance based on mortgage bundles, all unregulated and very difficult to value.
Timeline: 2007-2008

• 2007: Housing market troubles (Oversupply? Lagging personal income growth?) lead to defaults on mortgages as they cannot refinance at lower housing prices

• 2008: Investment banks’ high leverage (>30:1) mean they don’t have cash to pay interest on mortgage-backed securities. Insurance companies’ high leverage (AIG) means they can’t cover losses on these bonds.
$700 billion bailout, TARP, which has been used to prop up banks and car companies AND

Through April 30, the government has made commitments of about $12.2 trillion and spent $2.5 trillion — but also has collected more than $10 billion in dividends and fees.
Typical Crisis Fallacies

- “This time is different” rationalizations
- “Striking similarities to” fears
- Blame the speculators
- Remedies ignore incentives or set perverse incentives
Government Policy Tools

- Monetary Policy—lower interest rates and increase the money supply to encourage economic activity
  - Future danger from inflation
  - Takes 12-18 months to affect growth
- Fiscal Policy—direct spending, income support, lower taxes
  - Future danger from high budget deficits
  - 1% of GDP is $140 billion—takes BIG BUCKS
Government’s Total Bailout Tab

(New York Times 2/4/09)

- **THE GOVERNMENT AS INVESTOR**
  - $9.0 trillion
  - SPENT: $1.6 TRILLION
  - Includes direct investments in financial institutions, purchases of high-grade corporate debt and purchases of mortgage-backed securities issued by Fannie Mae, Freddie Mac and Ginnie Mae.

- **THE GOVERNMENT AS INSURER**
  - $1.7 trillion
  - SPENT: $330 BILLION
  - Includes insuring debt issued by financial institutions and guaranteeing poorly performing assets owned by banks and Fannie Mae and Freddie Mac.

- **THE GOVERNMENT AS LENDER**
  - $1.4 trillion
  - SPENT: $528 BILLION
  - A significant expansion of the government's traditional overnight lending to banks, including extending terms to as many as 90 days and allowing borrowing by other financial institutions.
Interest Rate Spreads Calming (A2/P2 and TED Spreads, May 19, 2009)
Private Economists Predict Recovery Beginning 2009: Q3
End of Recession is not End of Pain—Take Note

• Only time when real GDP is falling counts as “in recession”.

• Example: GDP falls by half and we go from 100% employed to 50% unemployment. While GDP is falling, we are in recession.

• If GDP stops shrinking, but doesn’t grow much, so we are still 50% unemployed, we are no longer in recession, though as a country we would still be miserable and in a slump.