THE ECONOMICS OF FINANCIAL CRISES

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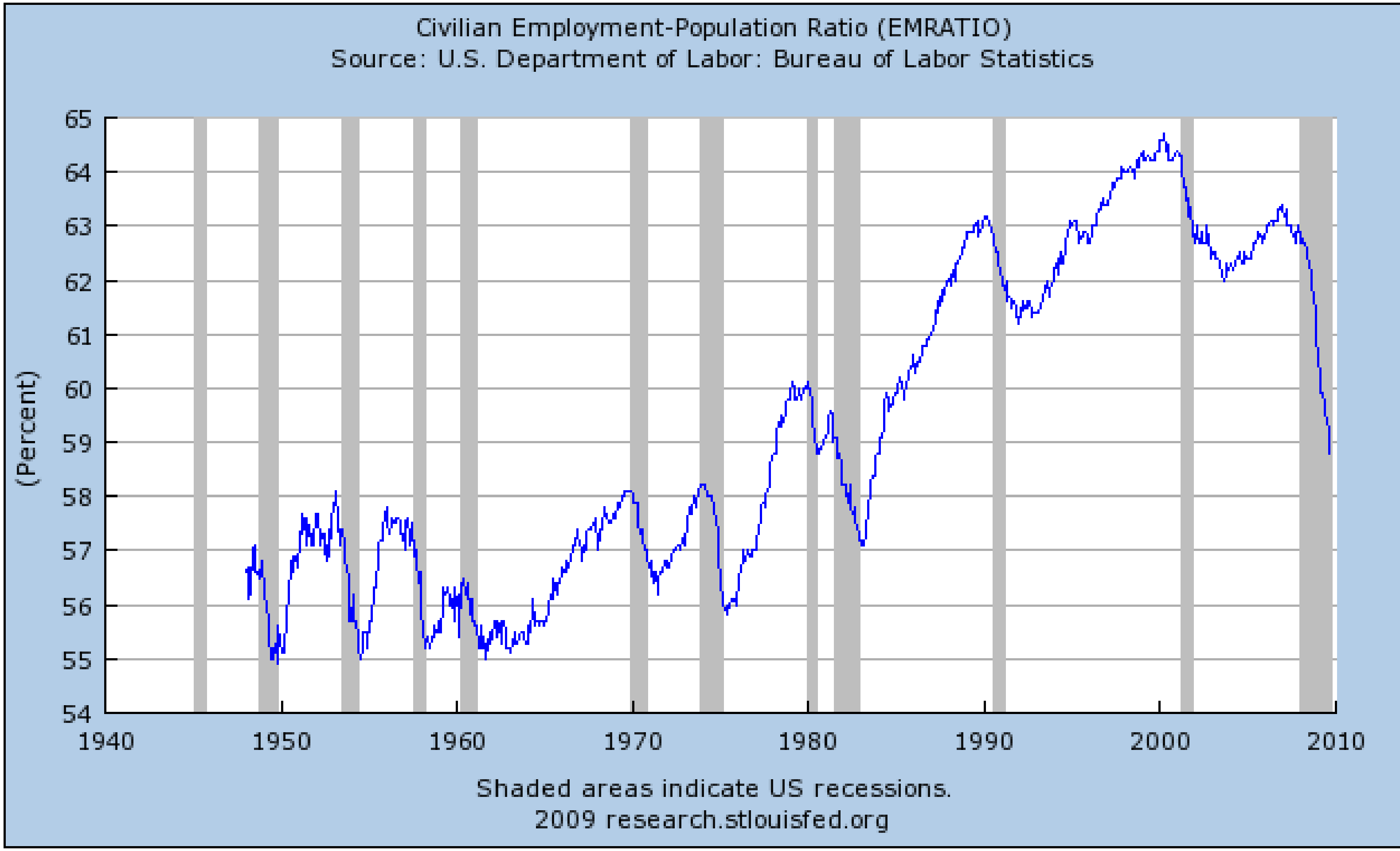
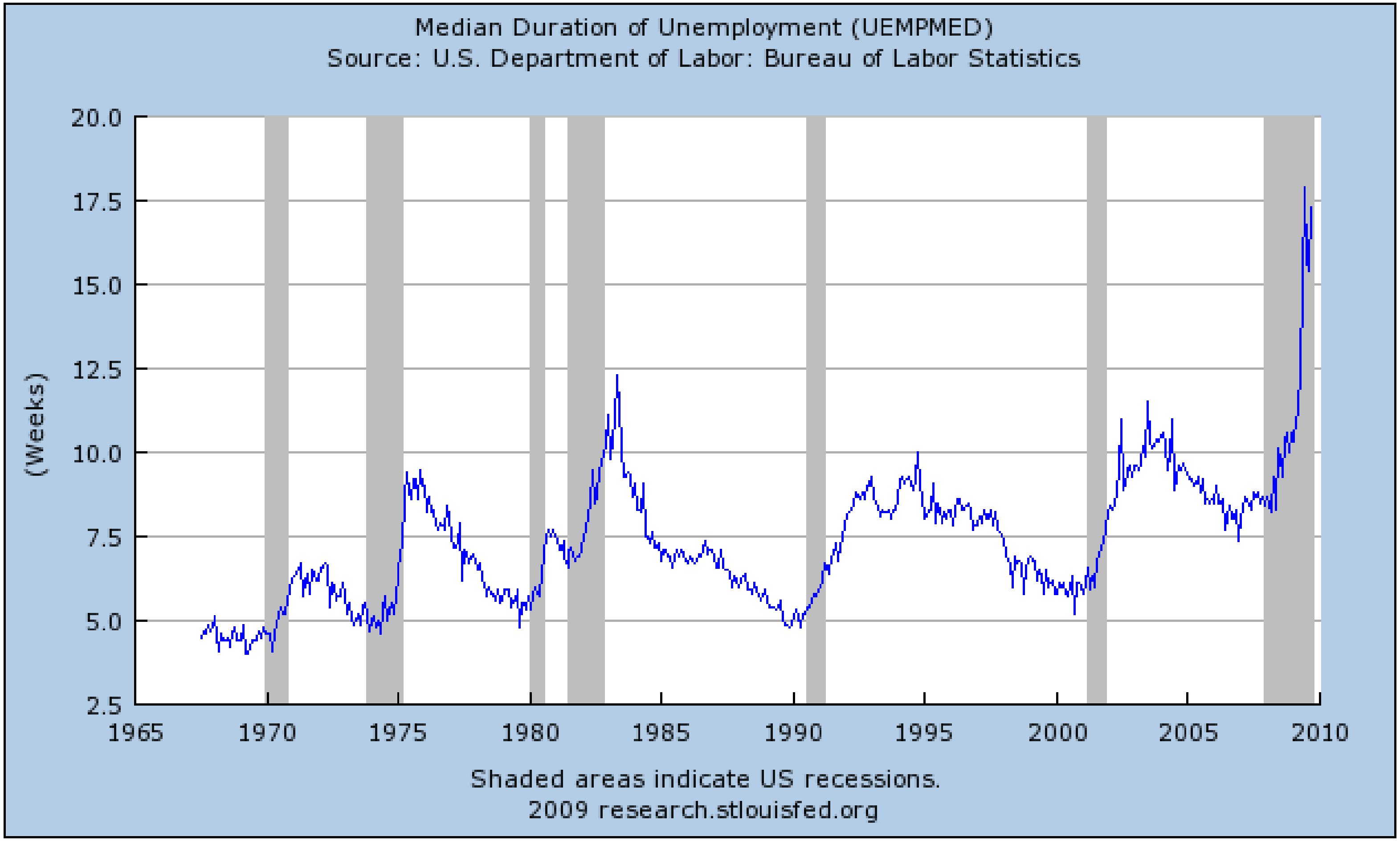
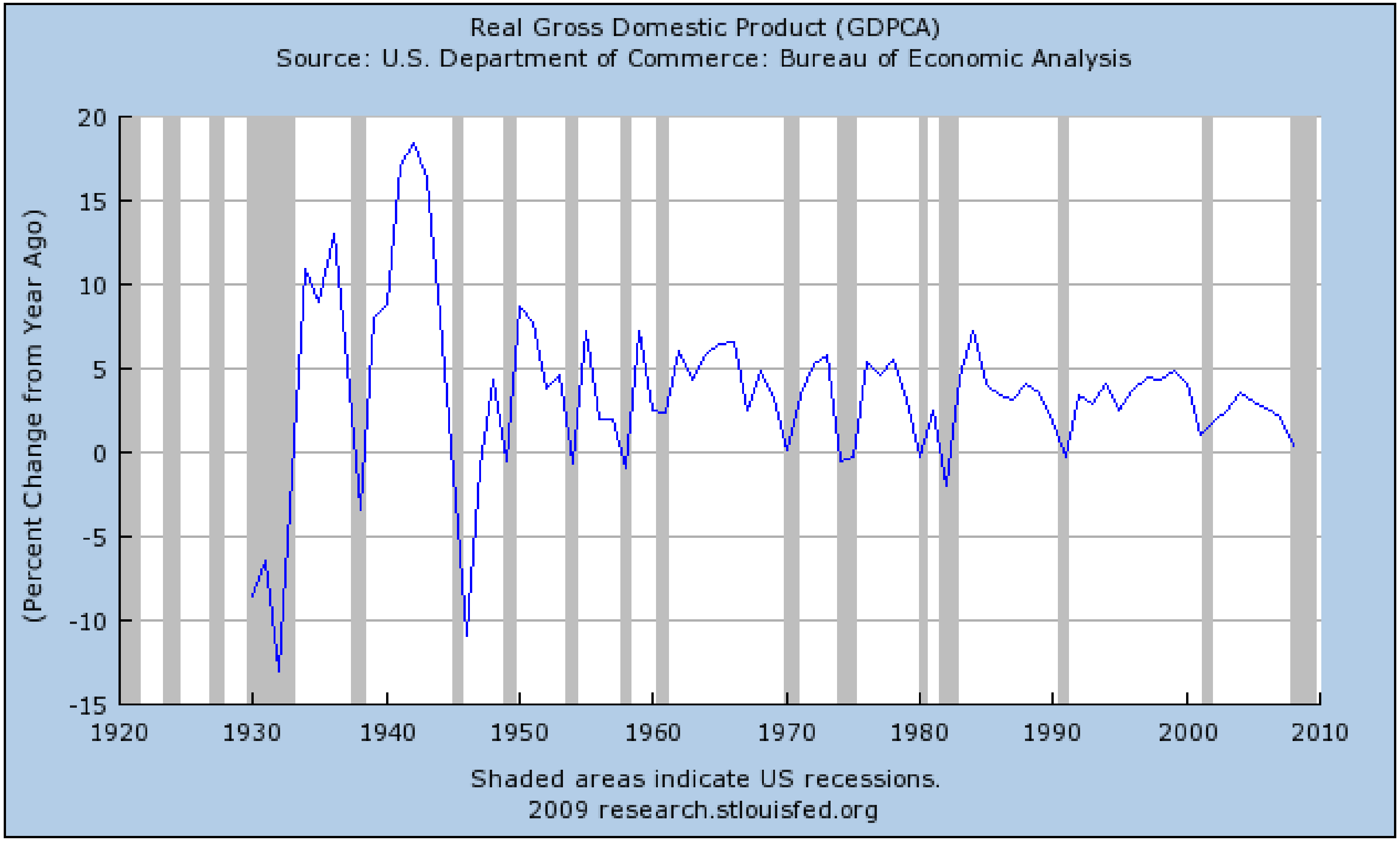
First, a few facts about the U.S. experience: The worst jobs recession since WWII



Half of unemployed searching > 17 weeks



But nothing like the Great Depression



The Great Depression vs. The Great Recession

1929-1932	2007-2009
25% fall in output	1% fall in output
25% unemployment	10% unemployment
33% fall in M2	10% increase in M2
25% fall in prices	5% rise in prices
Stock collapse, then bank collapse, then bailouts	Housing collapse, then bank collapse, then bigger bailouts

What Economists Learned about the Depression

- Mostly from Milton Friedman and Anna Schwartz's *Monetary History of the United States*
  - *Don't let the money supply fall by 1/3*
  - *By "money" we mean cash + checking + savings accounts*
  - *Don't let average prices and wages fall dramatically*
    - *Too hard to repay old debts when you earn less & sell less.*
      - *Irving Fisher, "Debt-Deflation Theory of Great Depressions," 1935*
    - *Workers resist wage cuts—get laid off instead*
  - *Loose money helps private sector heal itself*
    - *Different from government spending approach=Taking up slack*

Bernanke’s Promise: Never Again

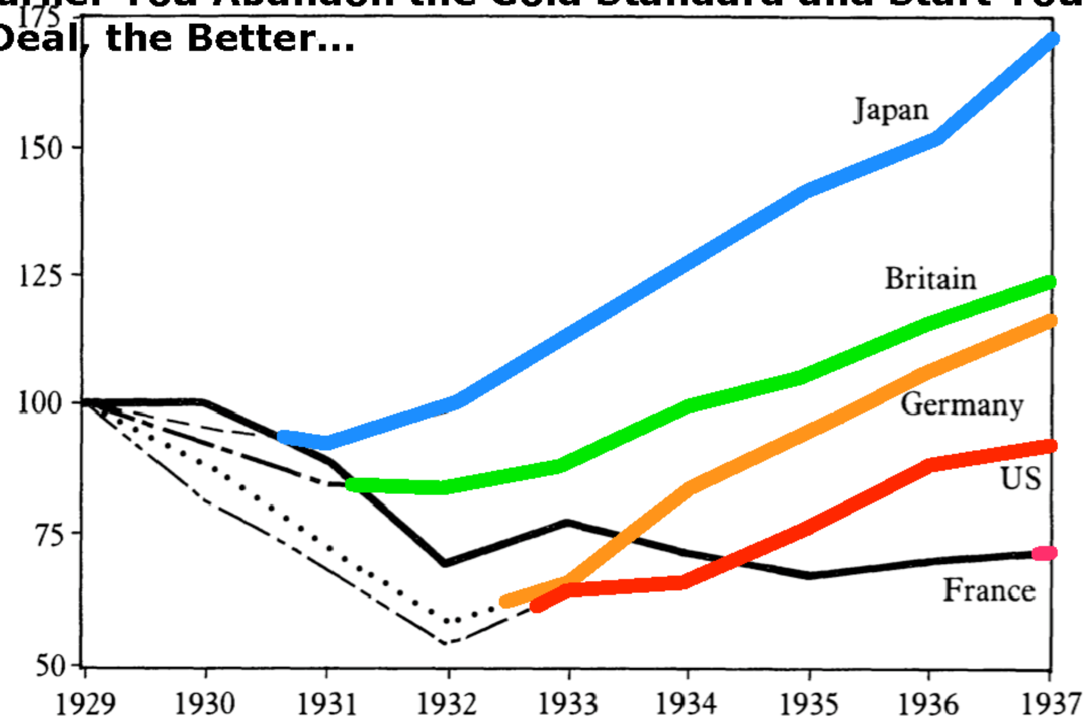
“Let me end my talk by abusing slightly my status as an official representative of the Federal Reserve. I would like to say to Milton [Friedman] and Anna [Schwartz]: Regarding the Great Depression. You're right, we did it. We're very sorry. But thanks to you, we won't do it again.”

--November 8, 2002, celebrating Friedman’s 90th Birthday

Bernanke: He changed our minds

- What did he teach (most of) us?
  - How well-intentioned tight money (i.e., the Gold Standard) made the Depression Great
  - How countries that quit the Gold Standard earlier recovered faster (e.g., Sweden)
  - Why healthy banks matter
  - How bank destruction worsened the Depression

The Earlier You Abandon the Gold Standard and Start Your New Deal, the Better...



Eichengreen (1992), "The Origins and Nature of the Great Slump Revisited"

Figure 5. *Indices of industrial production, 1929-1937* (1929 = 100)

Source: League of Nations, *World production and prices, 1937/8*, p. 44.

From delong.typepad.com, based on Bernanke and Barry Eichengreen's research.

Why does money matter?
A Typical answer: Sticky prices

- The Quantity Theory: A tautology that matters
  - MV = PY
  - Money * Velocity = Price level * Real Output
  - or Spending = Nominal GDP

- If prices are flexible, as in classical world, Y independent of M and P: 2*M → 2*P
- If prices are rigid (or slow to adjust): 2M→higher Y

Is it reasonable to believe in price and wage rigidity?

- Macroeconomists have agonized over "sticky wages" and "sticky prices."
  - ***Central to Keynesian, New Keynesian, and Monetarist views***
  - ***Good books with real facts:***
    - ***Blinder, <u>Asking about prices</u>:***
      - *Prices sticky for > 3 months for most of GDP*
    - ***Bewley, <u>Why wages don't fall during a recession</u>***
  - ***But recent supermarket scanner data shows lots of price changes***

Orange Juice price shocks: From the tree to the store in 5 weeks

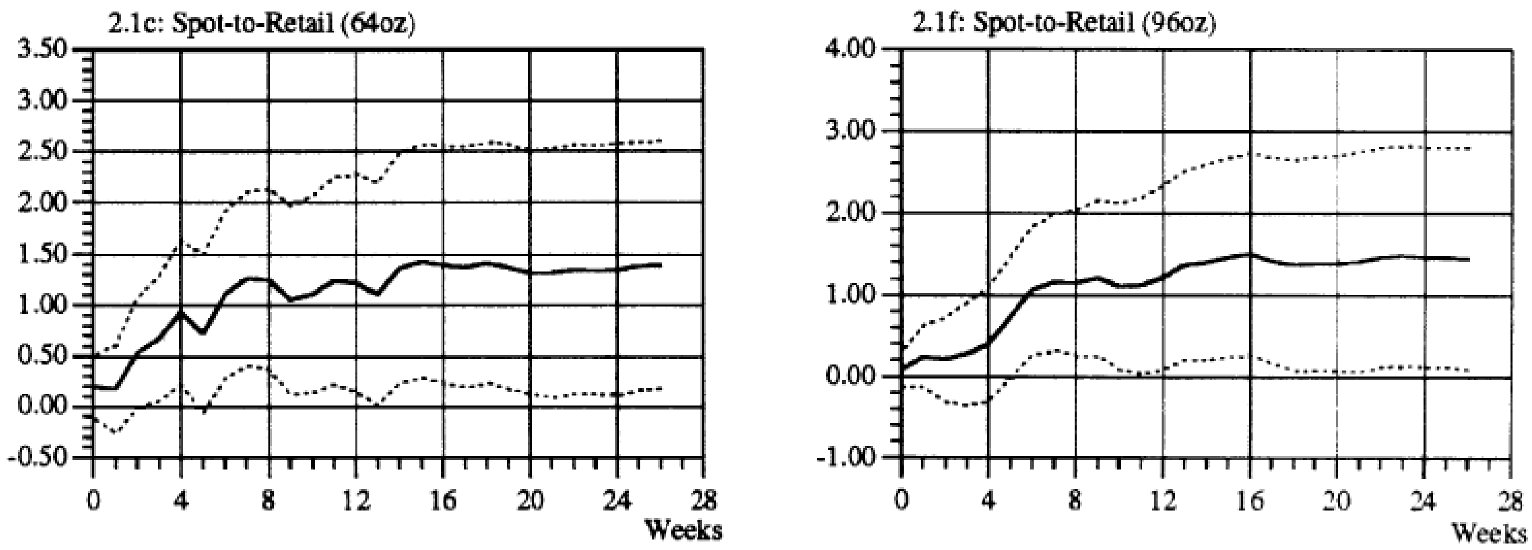


Fig. 2.1. Cumulative impulse response functions: refrigerated Tropicana.

Dutta, Bergen, Levy, J. Econ Dyn. and Control, 2002.

But wholesalers (middlemen) are more rigid:
"At the intermediate goods level of the market, in contrast, we find relatively more evidence of rigidity…."

Debt: The Stickiest Price of All

From Irving Fisher, "The Debt-Deflation Theory of Great Depressions, *Econometrica*, v.1.

- **Key fact: Interest and principal repayment are contractually enforceable**
- By contrast: Sticky wage and price stories often based on "norms," "invisible handshakes," "limited information," etc.
- With debt contracts, vision of (implicit) all-equity firm vanishes

Debt-Deflation with flexible prices

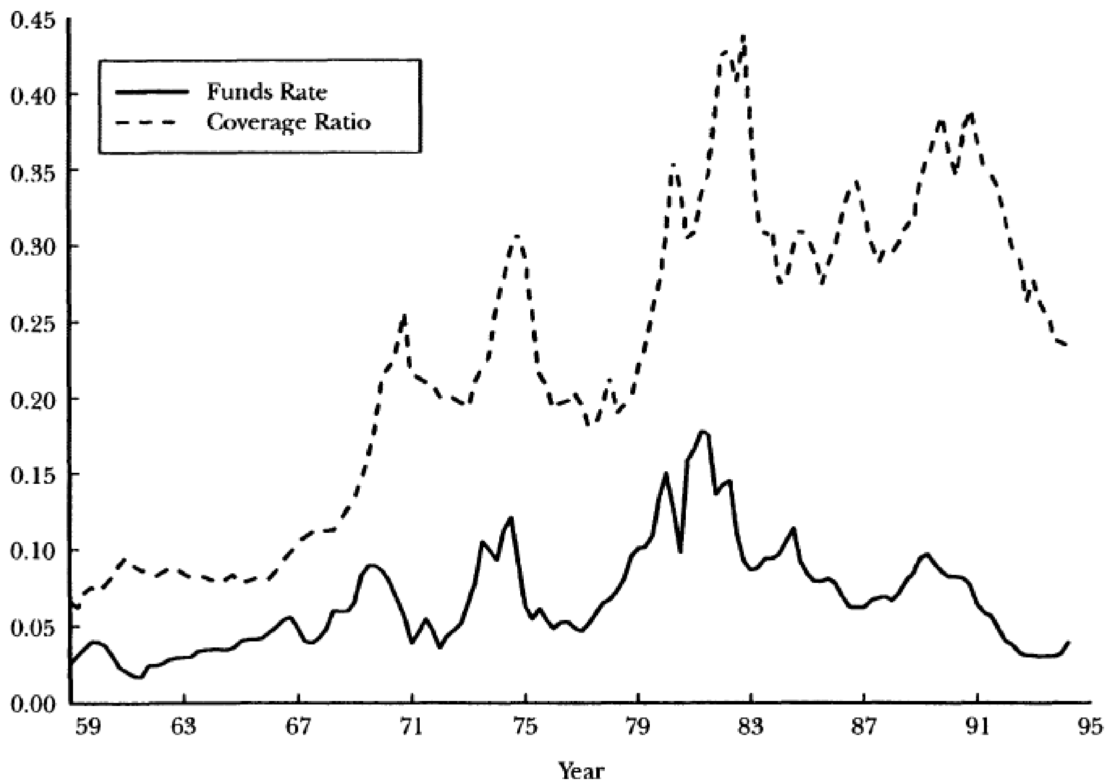
- Fisher turns arguments of flexible-price classicals against themselves:
  - Q: If M or V fall, what happens *within firms?*
  - A: As P falls, it's harder for debt-laden entrepreneur to make interest payments
    - "Free Cash Flow" falls (Hubbard JEL, Bernanke Gertler Gilchrist JEP)
    - Firm threatened with insolvency: Must ***deleverage***
      - "Distress selling" of assets to wrong people –Fisher
      - Further contraction of M as debts are repaid
      - If prices still flexible, more distress selling, more bankruptcies

More income heading to creditors→ The entrepreneur is less of an owner→ Less trust & so relationships falter

Coverage Ratio=

$\frac{\text{(int.+prin.)}}{\text{profits}}$

Figure 4
The Funds Rate and the Coverage Ratio



Source: Bernanke/Gertler, "Inside the black box," JEP

Debt-deflation on the balance sheet

- $V = D + E$
  - Value of firm = debt + equity
  - D is fixed by contract: E is a residual
- $V/P = D/P + E/P$

- Experiment: Hold V/P constant (classical assumption)
- Let P fall
  - D/P swells
  - D/P could well be > V/P
    - Insolvency
    - Getting D/P close to V/P is dangerous as well → Less trust

Big theory literature: Bernanke/Gertler "Agency costs, net worth and business fluctuations," Kiyotaki/Moore, "Credit cycles," Den Haan/Ramey/Watson, "Liquidity flows and fragility of business enterprises," etc.

What's so bad about insolvency?

- For some reason, it's a big deal
  - In textbook corporate finance, firm is handed to bondholders, who become new shareholders
    - D becomes the new E.
  - Could be done in 20 minutes
  - Oliver Hart's *Firms, Contracts, and Financial Structure:* Strongly recommended for its bankruptcy reform proposals
- In reality, bankruptcy seems inefficient and costly
  - Bondholders battle over priority for years
    - Prisoner's dilemma? Usually called a "hold-up" problem in finance
  - Managers engage in "asset stripping" during reorganization
  - Best employees leave
  - Real value lost, GDP hurt

Bernanke/Gertler : Debt-deflation meets Real Business Cycles

- "Agency Costs, Net Worth, and Business Fluctuations," American Economic Review, 1989.
- Two kinds of people: Entrepreneurs and Savers
- Technology shocks have small effect on Entrepreneur's Productivity
- Entrepreneurs don't have enough savings to reap full benefits of their ideas (realistic).

Bernanke-Gertler (2)

- Wouldn’t it be great if Entrepreneurs could borrow from Savers?
  - But ***trust and trustworthiness are hard to come by.***
  - Savers (S) could lend to Entrepreneurs (E), but afterward E could just say, “I was unlucky and lost S’s money” and repay little or nothing.
  - Bernanke/Gertler assume that it’s costly for S to audit E (realistic—banks do this for depositors).
    - “Costly State Verification,” Townsend 1979.
  - S’s will be willing to lend more when future is promising
    - Partly because of lower chance of having to pay audit fee

Bernanke-Gertler (3)

- What happens in normal times in this economy?
  - S does some lending to E, though some good projects go unfunded
  - Even in good times, some E are unlucky, fail to repay S, might get audited
- After a bad aggregate shock, what happens?
  - Key: Entrepreneurs have less collateral to contribute
  - "Agency costs are decreasing in the amount of entrepreneurial savings contributed to the project"
    - So S can't trust E as much: More distrust means less saving

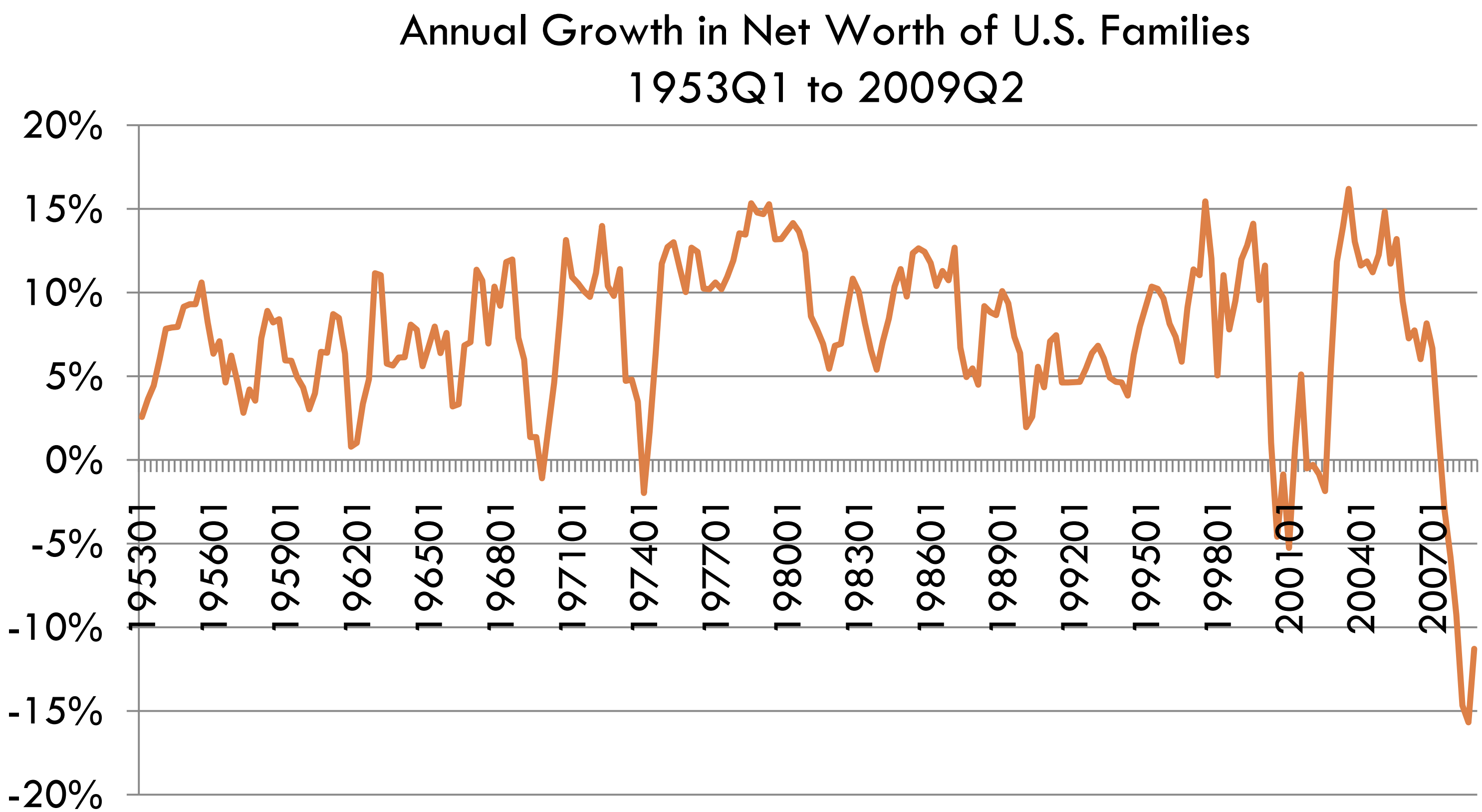
Bernanke-Gertler: The parable's lesson

- In a conventional Real Business Cycle model, the technology shock itself drives the whole business cycle
  - Not much propagation through capital, despite early hopes. Shocks must occur every quarter, in same direction as GDP.
- In B/G's model, a bad one-time technology shock can set off a long recession
  - One-time shock destroys E's productivity, which reduces E's collateral for next period, which reduces S's trust, which reduces S's savings, which reduces future output.

The Collapsing Housing Bubble: A one-sector fall in V and (hence) E

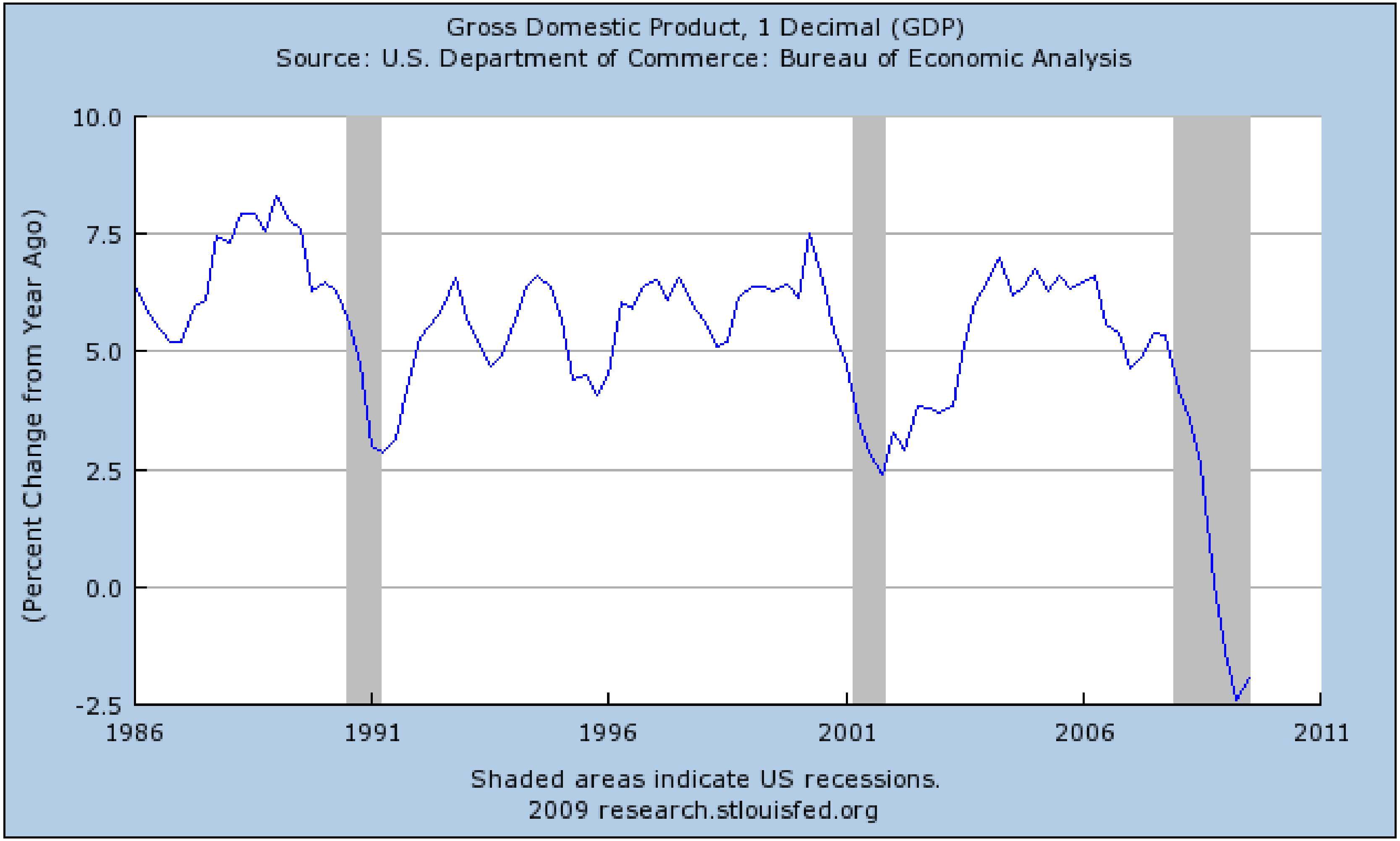
- Bubbles occur naturally in markets (*inter alia*, V. Smith)
  - Though excess liquidity helps
- Good policy finds a way to survive a collapsing bubble
- Banks and Householders held net worth in housing
  - Fall in V of housing made them insolvent
    - V<D for some banks and HH: **The Dual Equity Crisis**
  - Zero equity means zero trust
    - Playing poker with house money
    - Collapse in lending to equity-free banks and households

Would you lend to this family?



Source: Flow of Funds data, Federal Reserve Board website

Why the U.S. might not have enough (nominal) money to pay its bills



Scott Sumner’s Solution: More Inflation (The WWII Solution as well?)

One solution:
Boosting Equity by converting D to E

- Much talk of “deleveraging” to cut D
  - Value-destroying process, well-understood by Fisher
  - Firms/HH sell off V to others (boats in driveways) to raise cash
  - Firms/HH cut planned spending (vacation near home)
  - Strange, fast real-side readjustments that lower D
    - Can this be efficient?
- Instead: “Speed Bankruptcy”
  - Turn the textbook model into reality
    - Admit the truth: Someone won’t get paid
    - Turn debtholders into equity holders
    - Would make banks solvent overnight
    - President’s proposed new “resolution authority” for big banks would have this power
  - Joseph Stiglitz calls this “Super Chapter 11” → Lesson of ’97 Asia Crisis

What does this look like?

Example: *Citigroup, biggest TARP recipient*

(source: Citigroup 10-q, at Citi's website)

Assets

"$2 trillion," on paper

Liabilities:

$350 billion in long-term debt

$700 billion in worldwide deposits

$1 trillion in other liabilities

TARP money to Citi: $45 billion—a tiny amount of extra assets

Alternative 1: *FDIC sells off Citi shorn of long-term debt promises.*

Auction money goes to long-term debtholders.

If no bidders, shear off another layer of debt, auction again….

Alternative 2: *Judge pounds gavel, converting $350 B in long-term debt to common shares.*

Result: *Citi is recapitalized with 100% private money…and much less debt.*

Fewer debt promises make a safer Citi. ***V >> D***

Debtholders: The biggest winners from the bailout

- They've kept very, very quiet
- All U.S. big-bank debt is now implicitly or explicitly guaranteed
- If D is government guaranteed, then V must be kept bigger than D
  - A massive government promise
    - Easy to measure the size of the promise….

Vernon Smith has a related story

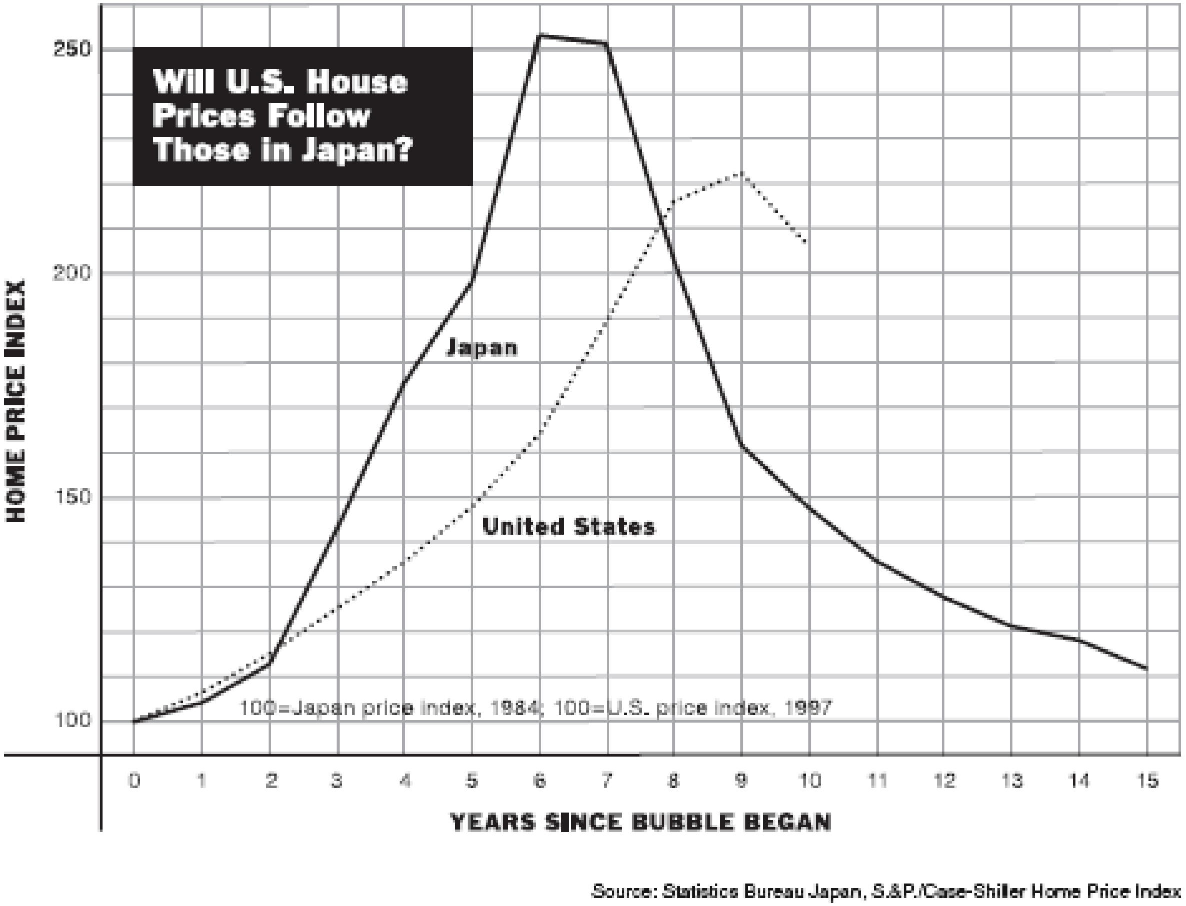
"It appears that both the Great Depression and the current crisis had their origins in excessive consumer debt -- especially mortgage debt -- that was transmitted into the financial sector during a sharp downturn." *Gjerstad and Smith, WSJ*

Summary: Fisher's "Sticky Debt" accelerator

- Sticky debt contracts deserve the attention paid to sticky wages and prices
- "Debt overhang" slows recovery after a bad shock
- Traditional approach: "Dig your way out."
  - A propagation mechanism→Helps explain business cycle

- An alternative: Let judges/FDIC/**someone** turn debt into equity **quickly**
  - Might turn out better, if externalities are big
  - Faster recovery likely: Low D/E ratio creates trust
  - Good policy finds ways to survive the collapse of a bubble
  - Won't people be terrified of lending?
    - Yes

Did we learn from Japan's experience?

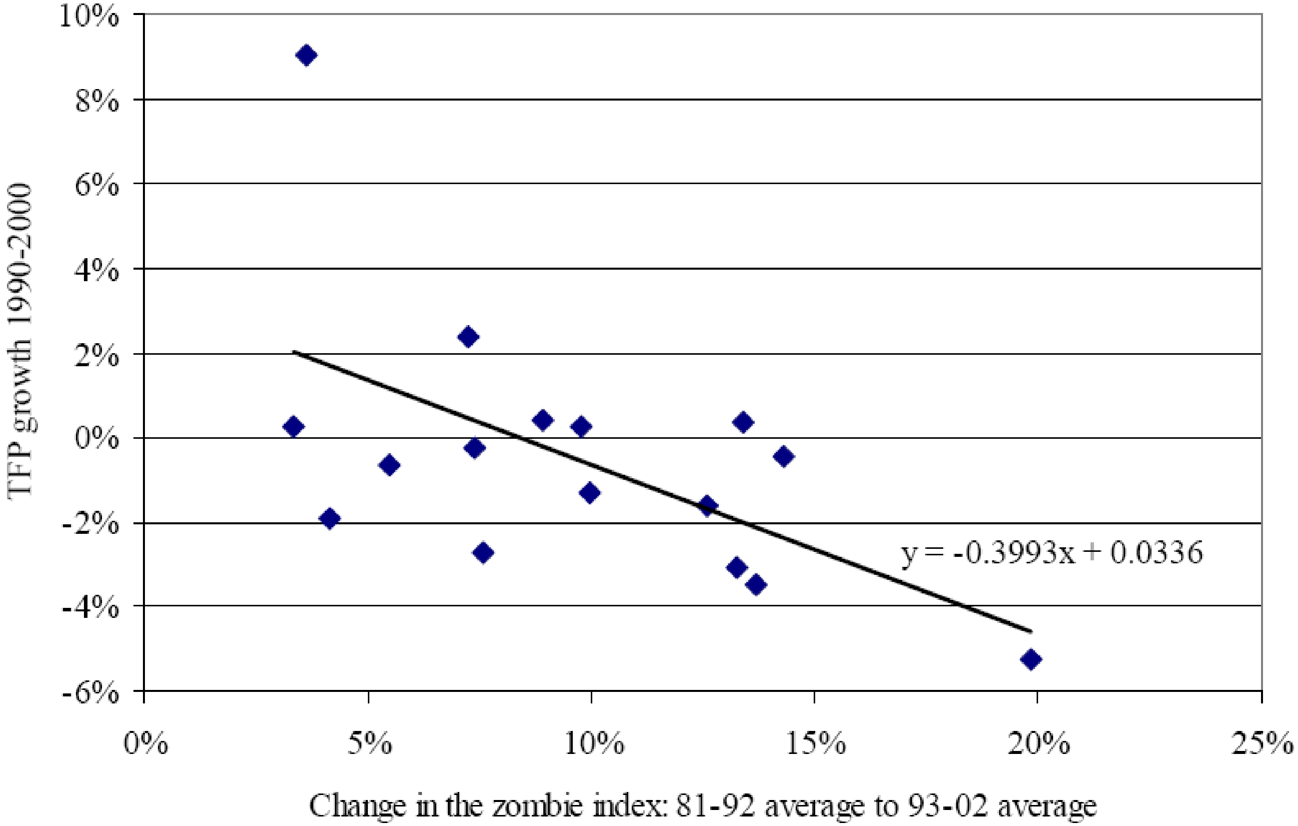


Source:
Alex Tabarrok, GMU Economics,
New York Times,
March 2008

Japan: Bursting Bubble → Zombie Banks

- A too-common financial crisis story
  - Banks lend based on a "New Era" story (Robert Shiller)
  - New Era collapses
  - Bank borrowers don't repay
  - Government keeps "zombie banks" alive
    - Rolling over bad loans→ Avoid bad news
    - Banks "make" lots of loans, but they are loans to old, bad risks
  - Result: Lost Decade of slow growth after crisis

Japan: Zombie sectors less productive a decade later



Source: Caballero, Hoshi, Kashyap, American Economic Review, 2008

Lessons I thought economists learned from Japan

- Make sure money supply grows
  - (Japan: 0% to 1% for too long)
- Don't let debt-heavy "zombie banks" limp along
  - A major research area in 1990's: Kashyap is best on this.
- Extra government spending yields little benefit
  - Might work if politicians were saints, spending on best projects
  - But in real world, spending goes to connected (or needy)
    - Less job growth: Overtime for a lucky few
    - Action bias: Politicians must "do something"

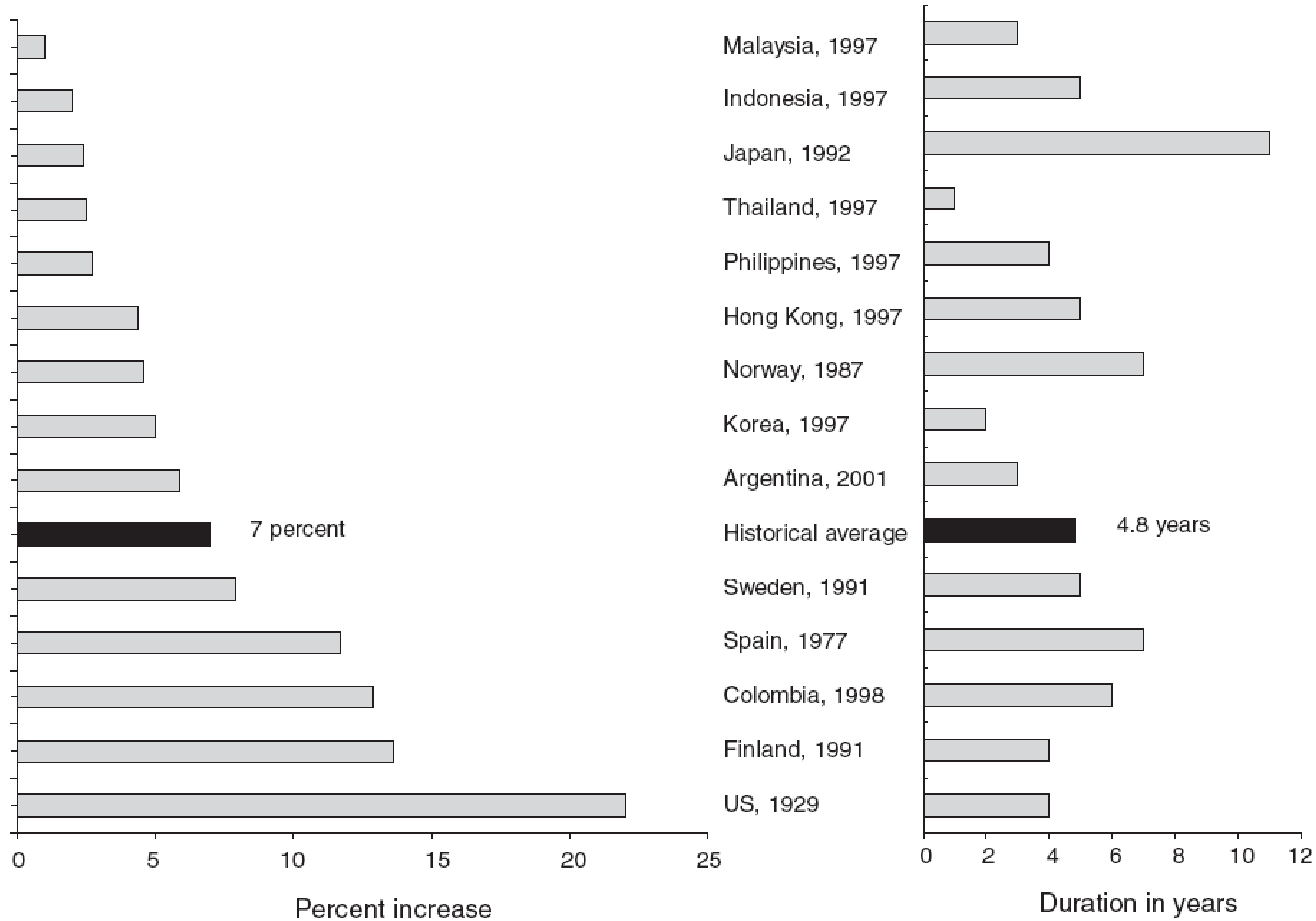


FIGURE 3. PAST UNEMPLOYMENT CYCLES AND BANKING CRISES: TROUGH-TO-PEAK PERCENT INCREASE IN THE UNEMPLOYMENT RATE (*left panel*) AND YEARS DURATION OF DOWNTURN (*right panel*)

Source: Reinhart and Rogoff, American Economic Review, 2009

Why a weak recovery?

- Zombie banks
  - Plus we just lost all of our big investment banks→
    Broken bridges between savers and borrowers
- Zombie households
  - Borrowing on credit cards (20% interest) not home equity loans (4%)
- Other possible explanations
  - Fed's fear of acting too aggressively
    - Political and economic consequences
  - "Option value of waiting" (Dixit/Pindyck/Bernanke)
    - In a time of political and economic turmoil, waiting can be the best decision, for firms and families
- Key lesson: Banking crises are different.
  - Banks perform a unique role connecting Savers to Entrepreneurs, and when the connection breaks down, output can be low for years.