How Friedman & Schwartz Saved the World in 2008

Milton Friedman, Monetary Theory, and the History of Chicago Economics

Thomas S. Coleman

Feb 24, 2020 (Draft February 23, 2020)

How Did Friedman & Schwartz Save the World in 2008?
I exaggerate, but only somewhat. There is truth in saying that Milton Friedman and Anna Schwartz, with *A Monetary History of the United States*, taught the Federal Reserve how to manage the 2008 financial crisis

I discuss three episodes, which teach us about money, banking, and liquidity crises:

- 1907-08: liquidity crisis, restricted convertibility, and depression
- 1930s: Fed failure, massive bank failures, and the Great Depression
- 2008: Quantitative Easing and how the Fed saved the financial system

Before turning to monetary history, let's review Milton Friedman & his contributions

Outline

Contents

Find these notes (and Vignettes) at www.hilerun.org/econ

1 Introduction to Friedman's Economics

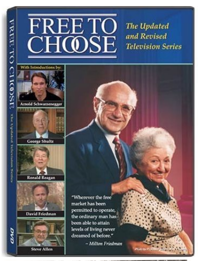
I will Focus on Milton Friedman's *Economics* – Not Politics
Many "Histories of Chicago Economics" discuss people, politics, ideology

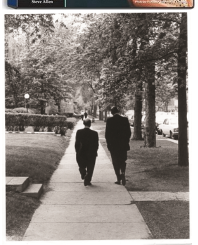
- Particularly Friedman, widely remembered for his popular TV shows and political advocacy

But I want to focus on Friedman's economics: the *Ideas* and *Concepts* . Two Central Themes:

1. Taking economics seriously
2. Applying and testing economics empirically

> In discussions of economic science, Chicago stands for an approach that takes seriously the use of economic theory as a tool for analyzing a startling wide range of concrete problems, . . . that insists on the empirical testing of theoretical generalizations, and that rejects alike facts without theory and theory without facts. [1974 address to the University of Chicago Trustees. cf UofC Magazine Jan-Feb 2007, volume 99, issue 3]





I. I am going to discuss ideas from Chicago and focus specifically on the University of Chicago.

(A) But let me be very explicit – I am not saying Chicago is the only source of good ideas in economics. But I have only limited time and we are here at Chicago and so we will focus on Chicago.

(B) The "Chicago School" includes Chicago, but there are economists not at Chicago and universities other than Chicago that think in the same way and have contributed to the "Chicago School".

Some of Friedman's Contributions to Economics

- Statistics: "Friedman test": non-parametric, repeated ranked treatments
  - Largely forgotten in recognizing Friedman's contributions
- Consumption Function and Permanent Income
  - Motivated by puzzles from Keynes's *General Theory* (Friedman 1957)
  - Concept of *Permanent Income* still used today
  - Central to question of fiscal stimulus – fiscal multiplier and marginal propensity to consume
- Methodology
  - How do we, as economists, make and test theories?
  - Fundamental and deep questions
- Phillips curve & Natural Rate of Unemployment
  - No inflation – unemployment trade-off
  - NAIRU or Non-Accelerating Inflation Rate of Unemployment
  - Basic microeconomics: people care about *real* wages, prices, etc.
  - I thought Friedman and Ned Phelps had killed the Phillips Curve in the 1960s
  - But still with us – like the Hydra it seems to always grow a new head
- Monetary History – maybe what Friedman is best remembered for

I. Statistics: "Friedman test": non-parametric test for repeated ranked treatments

- Part of standard statistics, but Friedman's contribution not widely remembered among economists.
- I happened to come across it when looking at the Ellsberg paradox and working with contingency table analysis

II. Consumption Function and Permanent Income:

- There was a puzzle (prior to Friedman's 1957 book *A Theory of the Consumption Function*) between cross-sectional and cross-country (or time-series) observations. Using cross-sectional data – across individuals at a point in time – economists found that people saved most of any increase in income and did not consume very much of the increase, while cross-country data or observations over long periods showed that consumption went up roughly one-for-one with income. Not only was this a puzzle but it had profound implications for Keynes's macroeconomic theories and the fiscal multiplier. Friedman introduced the idea of *Permanent* versus *Transitory* income to reconcile the observations. These ideas had important implications for Keynes's theory and the debates about the multiplier are as relevant today as in the 1950s. *The Theory of the Consumption Function* was a tour-de-force of methodology, and leads us to the next idea.
- The concept of permanent versus transitory income has become embedded throughout economics and remains as relevant today as it was over 50 years ago. How much consumers spend out of increased income (the marginal propensity to consume out of income and the fiscal multiplier) is central to Keynesian economic theory, was a vital question when governments undertook the substantial fiscal stimulus in response to the financial crisis of 2007-2008, and the question remains relevant today as governments consider fiscal austerity.

III. Methodology:

- Friedman in his *Methodology of Positive Economics* ([Friedman()]) stressed the idea that it is not the *assumptions* of a theory that are important but rather the *predictions*. This work remains as fresh and relevant to modern economics as it was 60 years ago and, rightly, remains on the reading list for graduate students today (at least at the University of Chicago). Friedman used the example of Newton's laws of motion and dropping a lead weight from the leaning tower of Pisa. Newton's laws technically apply only in a vacuum and Pisa is most certainly not in a vacuum. Still we use the laws because we know that they work – As Friedman says "The formula is accepted because it works, not because we live in an approximate vacuum – whatever that means." We know that for a lead weight over that distance air pressure does not matter. But think about a feather – we would not apply Newton's laws because we know that for a feather the air pressure matters. Or military ballistics calculations – they are adjusted for wind and other factors. These ideas of how do we build and test economic theories are as relevant today as in 1953 – indeed James Heckman has recently written on this very topic.

IV. Monetary History:

- Friedman may be best known for his monetary theory, and this remains as relevant today as it did when he was writing in the 1950s, 1960s, and 1970s. The idea that a pegged interest rate will lead to unstable inflation / deflation – expressed in his justly-famous address as president of the AEA ("The Role of Monetary Policy," *The American Economic Review*, Vol. 58, No. 1 (Mar., 1968), pp. 1-17) – is still held as a basic operational tenet by most central bank economists. Even thought the six-seven years post-2009 proved that a rate pegged at zero actually produces remarkably low and stable inflation. *The Monetary History of the US* with Anna Schwartz changed the way economists viewed monetary theory, and our understanding of the Great Depression. Among other things it taught us about the proper role of the Fed in a financial crisis. In 2002 at an event here in Ida Noyes, Ben Bernanke, then only a member of the Board of Governors rather than the Governor of the Federal Reserve, turned to Friedman and Schwartz, saying "I would like to say to Milton and Anna: Regarding the Great Depression. You're right, we [the Fed] did it. We're very sorry. But thanks to you, we won't do it again." In 2008, as Governor, Bernanke followed through and injected massive liquidity into the US banking system, in doing so probably saving the world from another Great Depression.

V. Phillips curve and Natural Rate of Unemployment (Non-Accelerating Inflation Rate of Unemployment or NAIRU):

- The Phillips curve is a monster that never seems to die. Many economists and central bankers still seem to believe that there is some trade-off between inflation and growth or unemployment – lower inflation means lower growth. Neither logic nor evidence seems to dissuade people from this idea. Yet Friedman disposed of the idea in his 1968 AEA presidential address, and in work with Edmund Phelps (still active, at Columbia). Friedman and Phelps argued that employment and unemployment will depend on *real* wages not *nominal* wages, and thus not on inflation, but that the distortions imposed by inflation can temporarily mislead workers into thinking real wages have gone up while at the same time employers believe real wages have gone down. There is a temporary increase in employment (fall in unemployment) when inflation rises – but there is no permanent trade-off. The argument is masterful and is as strong today as when originally proposed.

Price Theory (Microeconomics) Fundamental for Friedman
Friedman's contributions are concentrated in *Macro*

- But everything he did was built on *Micro*
- Chicago *Price Theory* – The application of microeconomics to real problems

Chicago has a long tradition of using and teaching Price Theory

- Jacob Viner taught Econ 301 – "Price and Distribution Theory" – from the 1920s through 1946
- Friedman taught it for many years after Viner
- Econ 301, "Price Theory", is still the core and central course for microeconomics for economics PhDs.
- Passed from one generation to the next: Viner taught Friedman; Friedman taught Becker; Becker taught Allen and myself. And we have taught some of you.

Price Theory

I. Jacob Viner taught Econ 301 – Price and Distribution Theory – from the 1920s through 1946. Econ 301, Price Theory, is still the core and central course for microeconomics for economics PhDs. I took it. Allen took it. Friedman took it from Viner, Becker took it from Friedman, I took it from Becker.

II. I think there is an important difference in focus between Chicago price theory and microeconomics as it is taught at many other institutions. In fact Chicago (BFI) offers a one-week summer program – Price Theory Summer Camp – that is targeted at graduate students from other institutions.

III. The distinction between Price Theory and Microeconomics is not in the underlying economic theory but rather in thinking about problems and applications. Taking price theory seriously as a way of looking at the world and the way that people behave. In my mind (and this is an exaggeration but a useful one)

   (A) Microeconomics
      1. The mathematics and models of utility maximization, consumer choice, firm profit maximization, market equilibrium
      2. The material of Varian's Intermediate Microeconomics

   (B) Price Theory
      1. How we use microeconomics. How to think about economic puzzles
      2. Existing problems – such as how a tax affects the rental price of apartments.
      3. Pushes us to think about new problems or existing problems in new ways
         i. Why do ski resorts sell lift tickets on a per-day basis rather than per-ride basis?
         ii. Why is family size lower in developed countries than developing countries?
      4. Steven Landsburg's Price Theory is great. And McCloskey's The Applied Theory of Price

IV. I am Exaggerating Distinction / Differences

   (A) But the exaggeration is useful – highlights two faces of microeconomics

Heckman's "Three Ground Rules for Chicago Economics"
Jim Heckman (who you heard a week or two ago) lays out some "Ground Rules" – rules that Friedman would no doubt endorse

1. Faculty know and understand the corpus of economic theory and economic empirical knowledge – not just their specialty within the field. *Students and faculty speak a common language – the language of basic price theory and the economics of incentives – and that we can communicate these ideas clearly.*

2. Chicago views economics as a serious subject, tackling serious problems.

3. Chicago economics demands that scholars move beyond selective and self-serving appeals to "stylized facts" to "illustrate" theories and instead engages and promotes the serious scientific task of careful and creative analyses of data, linking theory and evidence. Chicago values the hard empirical work that produces convincing evidence and rigorous economic theorizing that produces lasting contributions to important problems.

Quoting from 2012 presentation at the Friedman Centenial Celebration

2 Quick View: Permanent Income & Natural Rate

Contents

Permanent Income and *Theory of the Consumption Function*
Puzzle, related to Keynes's *General Theory*, Marginal Propensity to Consume, and fiscal multiplier

- MPC: How much does Cons ↑ when Inc ↑? How much spent vs saved?
- Cross-section (point-in-time): MPC low, most saved (savings ↑)
- Time-series & cross-country: MPC near one, savings rate constant

Friedman has wonderful, and wonderfully simple, explanation:

- Permanent vs Transitory Income: $\Delta Y = \Delta Y_{perm} + \Delta Y_{trans}$
- $MPC_{perm} \approx 1$, $MPC_{trans} \approx 0$
- We often mis-measure "income":
  - Measure across people, much income difference Y_{trans}
  - For aggregate (measure across time) Y_{trans} averages out, see ΔY_{perm}
- Friedman's 7-day week example: On Wed, 6 workers earn \$0, 1 earns \$100 and saves most (spends little, MPC low)

Hugely relevant for today's questions about government tax and spending stimulus

Consumption Function and Permanent Income (repeated from above):

- There was a puzzle (prior to Friedman's 1957 book *A Theory of the Consumption Function*) between cross-sectional and cross-country (or time-series) observations. Using cross-sectional data – across individuals at a point in time – economists found that people saved most of any increase in income and did not consume very much of the increase, while cross-country data or observations over long periods showed that consumption went up roughly one-for-one with income. Not only was this a puzzle but it had profound implications for Keynes's macroeconomic theories and the fiscal multiplier. Friedman introduced the idea of *Permanent* versus *Transitory* income to reconcile the observations. These ideas had important implications for Keynes's theory and the debates about the multiplier are as relevant today as in the 1950s. *The Theory of the Consumption Function* was a tour-de-force of methodology, and leads us to the next idea.

- The concept of permanent versus transitory income has become embedded throughout economics and remains as relevant today as it was over 50 years ago. How much consumers spend out of increased income (the marginal propensity to consume out of income and the fiscal multiplier) is central to Keynesian economic theory, was a vital question when governments undertook the substantial fiscal stimulus in response to the financial crisis of 2007-2008, and the question remains relevant today as governments consider fiscal austerity.

> The central theme of this monograph can be illustrated by a simple hypothetical example. Consider a large number of men all earning \$100 a week and spending \$100 a week on current consumption. Let them receive their pay once a week, the paydays being staggered, so that one-seventh are paid on Sunday, one-seventh on Monday, and so on. Suppose we collect budget data for a sample of these men for one day chosen at random, defined income as cash receipts on that day, and defined consumption as cash expenditures. ... It may well be that the men would spend more on payday than on other days but they would also make expenditures on other days, so we would record the one-seventh with an income of \$100 as having positive savings, the other six-sevenths as having negative savings. Consumption might appear to rise with income, but, if so, not as much as income, so that the fraction of income saved would rise with income. [Chapter 9 of *A Theory of the Consumption Function*, Princeton University Press, 1957]

Phillips Curve and Natural Rate of Unemployment

Phillips Curve: Prices (Inflation) ↑ Unemployment ↓ (or growth ↑)

- Appealing: high employment ⇒ firms must pay workers more ⇒ wages ↑

But this confuses *nominal* versus *real*

- Inflation is nominal, money wages are nominal
- Firms and workers care about *real* or relative wages

Friedman explains puzzle this way (best in his 1976 Nobel lecture; also Phelps)

- "Natural Rate" set by real variables: preferences, production function, relative wages, etc.
- *Unexpected* inflation obscures real changes for firms and workers
  - Firms: price increase assumed to be *relative* (real) price, pushes down real wages, induces firm to raise nominal wages somewhat & hire more
  - Workers: rise in nominal wage assumed to be *real* wage increase, willing to work more
- Result: inflation ↑ induces firms to hire, workers to work more
- But firms & workers soon realize mistake, and go back to natural rate

Can't escape "Natural Rate" in long-run

Phillips curve and Natural Rate of Unemployment (Non-Accelerating Inflation Rate of Unemployment or NAIRU) (repeated from above):

- The Phillips curve is a monster that never seems to die. Many economists and central bankers still seem to believe that there is some trade-off between inflation and growth or unemployment – lower inflation means lower growth. Neither logic nor evidence seems to dissuade people from this idea. Yet Friedman disposed of the idea in his 1968 AEA presidential address, and in work with Edmund Phelps (still active, at Columbia). Friedman and Phelps argued that employment and unemployment will depend on *real* wages not *nominal* wages, and thus not on inflation, but that the distortions imposed by inflation can temporarily mislead workers into thinking real wages have gone up while at the same time employers believe real wages have gone down. There is a temporary increase in employment (fall in unemployment) when inflation rises – but there is no permanent trade-off. The argument is masterful and is as strong today as when originally proposed.

[Friedman(1976), Friedman(1968), Phelps(1968), Phelps(1967)]

3 Monetary History and Three Financial Crises

3.1 Financial Crises are American as Apple Pie

Contents

My "History of Financial Crises" in 40 minutes
This is all based on my PPHA 42521 "History of Financial Crises" (Spring)

> We will examine financial and economic history, using episodes of crisis to learn about government debt, money, and banking. We will try to understand some of the mechanisms and processes that seem to generate financial crises. We will read some of the classics as well as some of the newer texts in this area

Better title "Money, Banking, and the History of Financial Crises". Examine a variety of episodes:

- South Sea Bubble (England) and Mississippi Bubble (Paris) from 1719-20
- Alexander Hamilton and the 1790s US Financial Revolution
- US Banking Crises (1893, 1907, 1930s)
- 2008 Financial Crisis

US Always Has Been Subject to Banking Crises

Look at US from 1840 to present: 12 crises

- US: C&H say 12 crises. R&R count 9 (not all the same)
  - Multiple bank failures (9,000 during 1930s, 3,000 during 1980s)
  - Happened regularly during 1800s, into 1900s
  - By 2008, we had just forgotten
- Interesting quiz – how many in Canada?
  - C&H count 0: No severe crises since 1840

Why? Fundamental difference US vs Canada is banking structure: US fragmented unit banking – read Calomiris & Haber

Kindleberger	Calomiris&Haber	Reinhart&Rogoff Table A-3	Friedman&Schwartz
	1814-16	1814	
1819		1818-19	
UK, not US	1825	1825	
1837	1837-39	1836-38	
1857	1857	1857	
	1861		
1873	1873	1873	1873, suspend
	1884	1884	
UK, not US	1890		
1893	1893	1890, I think 1893 is what they mean	1893, suspend
	1896		"perhaps 1893-97"
1907	1907	1907	1907, suspend
		1914	
1920-21			1920-21
	1920s		
1929	1930-33	1929-33	1930-33
1982-87	1980s	1984-91	
	2007-09		

[Calomiris and Haber(2015)]

3.2 Basics of Money and Banking

Contents

Money & Banking: Checking Accounts and Money

We all use checking accounts (bank demand deposits)

- Convenient complement to cash
- Treat them like money – transfer money, pay bills by check, etc.

But deposits are really a loan we make to a bank

- Like any promise, may be broken
- Like any loan, may not be repaid

But deposits are loans with two special characteristics:

- Bank promises to pay us back whenever we want
- When a bank defaults, first-in-line depositors get their money

These characteristics provide big incentive for customers to run on the bank, if there is even a hint of default

Why Were (US) Banks so Fragile, Subject to Runs?

Bank deposits are inherently unstable

- Most people argue this makes banks inherently unstable, subject to runs
- Cannot be true – look at US (12 systemic crises 1840-present) vs Canada (0)

There has to be something additional to make US uniquely unstable

- In the 1800s and up until 1990s, it was *Unit Banking*

Hard to imagine now how crazy stupid US banking was until 1990s

- No cross-state banking – couldn't open Chase account in Illinois
- Many states (Illinois included) had *no branching*

In 1914, US had 27,349 banks, 95% no branches (single building!)

- Population roughly 99mn ⇒ 3,600 people per bank (and fewer customers)
- Not nearly enough to reap economies of scale or diversification

Canada completely different – 38 banks in 1890, 126,000 people per bank

- Each bank had many branches
- Actually more branches per person than US

US Banks Were Always on Edge of Disaster

US banking system was inherently fragile

- Any modest economic shock (an earthquake in San Francisco, a severe economic recession, the bursting of a speculative bubble in copper, the failure of a local bank) could make customers nervous and want to withdraw their money
- A small local unit bank cannot call on headquarters to ship out more cash
- If too many customers want to withdraw, the small local bank has to shut its doors, making surrounding customers even more nervous

> In a unit banking system with some 20,000 independent banks, the impact was bound to be uneven, to force some banks into suspension, and to threaten a chain reaction involving a cumulative increase in the desire on the part of the public to convert deposits into currency. Friedman & Schwartz p. 169

How to Break the Viscous Cycle of a Bank Run?

Essentially 3 (4) ways to break the viscous cycle

1. Make banks big enough to withstand economic shocks and scares (able to ship cash around the country, to a branch in trouble)
2. Restrict conversion: Tell customers they cannot convert deposits into cash
3. Have someone lend cash (short-term) to banks in trouble
4. *Deposit Insurance*

The US in the 1800s and most of 1900s said "No" to (1). In 1907 nobody to do (3) effectively. (4) didn't exist (and anyway is more a subsidy for small inefficient banks than a solution – another story). So only choice was (2)

3.3 1907: Liquidity Crisis, NY Banks Restrict Convertibility

Contents

Set the Scene in 1907: Fragile Banks, Economic Shocks

Fragile Banks:

- 27,349 US banks in 1914, 95% no branches (single building)
- Small, fragile banks: roughly 3,600 *people* per bank
  - No economies of scale, no way to diversify

Economic Shocks

- April 1906, San Francisco earthquake – reduced GNP by 1.5-1.8 percentage points
- August 1907, severe recession started
- October 16, two speculators (F. Augustus Heinze and Charles W. Morse) lost big on copper company stock market speculation, had borrowed from banks

Bank Runs – NY Clearing House Restricts Convertibility

Bank Runs

- Starting Oct 16, banks associated with Heinz & Morse suffered runs
- Oct 18 Knickerbocker Trust run started, Oct 22 Knickerbocker failed

Bank Responses

- Strong banks and NY Clearing House: loans to "run banks" (trying to do (3) above)
- Oct 26 (Saturday) NY CH banks restricted convertibility of deposits to cash
  - Naturally, premium on cash and gold
  - Pulled gold in from overseas, increased cash & gold

Restriction on Convertibility

- Extraordinary – today: shutting all ATMs, not allowing credit cards
- Effective way to forestall a run
- Lifted restriction in January 1908

NBER paper about San Francisco earthquake as trigger for 1907 panic:

> Economists have long studied the relationship between the real and monetary sectors. We examine the macroeconomic effects of the 1906 San Francisco earthquake, a shock that immediately reduced United States. GNP by 1.5-1.8 percentage points. The quake's impact manifested itself in gold flows, as British insurance companies paid their San Francisco claims out of home funds in the fall of 1906. The capital outflow prompted the Bank of England to raise interest rates and discriminate against American finance bills. British bank policy pushed the US into recession and set the stage for the 1907 financial crisis. The 1907 panic led to the formation of the National Monetary Commission whose proposals recommended the creation of the Federal Reserve. In this study, we identify the San Francisco earthquake as the shock that triggered the chain of events that culminated in the panic of 1907. ([Odell and Weidenmier(2002)]

For the story of the 1907 panic, see [Moen and Tallman(2015), Economist()], plus [Moen and Tallman(1992), Tallman and Moen(1990)] and Chapter 4 Section 3 of [Friedman and Schwartz(1963)].

Money Demand ↑ Money ↓ Output & Prices ↓: Ideas
Friedman & Schwartz thought carefully about money
What was happening during a bank run (liquidity crisis)?

- Customers and banks both start to worry about liquidity
- Want more of the most liquid asset they can find – cash
- Demand for "cash" spikes up
  - Customers (public) worried about bank deposits, switch to cash
  - Banks need more cash ("reserves") to reassure customers, to pay out when needed

Importantly Friedman & Schwartz collected and analyzed a mass of data
Three definitions:

1. "Cash" held by banks called "reserves"
2. High Powered Money = cash held by public + "cash" held by banks (reserves)
3. Money = public cash + deposits

I cover this in my *Financial Crises* class

Liquidity Crisis: Cash (Money) Demand ↑↑, Supply Flat
Results when cash demand spikes up and supply can't keep up:
Banks

- Customers ask for cash,
- With small, fragile banks (US) some banks don't have enough extra and fail
- Produces cascading failures – contagion, panic

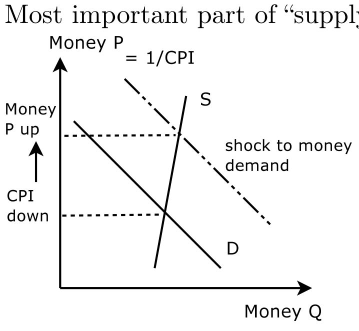
Prices

- CPI (price level or inflation) is the "price" of money
- Prices have to adjust ↓

Output & employment

- Recession (depression) pushes prices ↓

Most important part of "supply":



- HPM = cash held by public + "cash" held by banks (reserves)

Recessions Bad After 19th & 20th c Liquidity Crises

Post-crises recessions (1873-79, 1893-94, 1907-08, 1920-21)

- Financial crises produce recessions – "depressions".

Average Recessions – Crisis vs. Non-Crisis Episodes, 1870-1928

	Numb	Ch Prc	Ch Inc	Ch M
Average recessions following financial crisis	4	-6.3%	-6.0%	-1.5%
Average non-crisis recessions	11	0.2%	-0.9%	5.6%

Length and Depth of Recessions after Speculative Episodes

Date	NBER peak/trough	Length	Ch Prc	Ch Inc	Ch Mon	Recovery Ch Inc
1873-79	Oct 1873 - Mar 1879	5.4yr	-3.8%	2.5%	0.4%	4.3%
1893-94	Jan 1893 - Jun 1894	1.4yr	-6.3%	-7.9%	0.5%	9.4%
1907-08	may 1907 - Jun 1908	1.1yr	-0.2%	-12.5%	-1.4%	5.4%
1920-21	Jan 1920 - Jul 1921	1.5yr	-14.8%	-6.1%	-5.6%	9.3%
1929-33	Aug 1929 - Mar 1933	4.2yr	-7.5%	-11.1%	-8.8%	11.6%

data are from *Monetary History* and other Friedman & Schwartz books

3.4 1913: Federal Reserve Founded

Contents

1913: Federal Reserve as Solution to Liquidity Crises

Recognition that money (HPM) needed to be "elastic" in the sense of expanding during liquidity crisis.

- Dec 1913, Federal Reserve founded
- One explicit purpose: to issue notes by "discounting bank assets" (lending to a bank based on assets – collateral – provided by the bank)

Goes back to Bagehot's rules for central banking (and developed earlier, 1790s, by Alexander Hamilton)

- First: lend freely and vigorously, but at a very high rate of interest (to discourage those who do not have liquidity problems)
- Second: lend on all good securities (securities used as collateral) to everyone who is solvent

- Bagehot's rules ([Bagehot(2012)] Chapter 7, paragraphs 57-58) but actually articulated & implemented by Hamilton 80 years earlier (1792)

3.5 1930s: Federal Reserve Fails

Contents

Fast Forward to next Financial Crisis: 1929-30

October 1929, stock market crash

- Recession started earlier – August 1929
- Up through autumn 1930 bad but not horrendous

October 1930 – banks started failing

- 256 in November 1930 and 352 in December

  A contagion of fear spread among depositors, starting from the agricultural areas (F&S p 308)

Now, banks had neither the incentive nor the authority to restrict payments

- The Fed had been founded to solve this problem

But the Fed failed to act to increase HPM in response to spike in liquidity demand

- Bank failures cascaded – by 1933 1/3 of banks gone

Bank failures November and December 1930: [Friedman and Schwartz(1963)] p 308

Examine F&S Data: Money, Prices, Output ↓

Date	NBER Pk/Tr	%Ch Mon Stock	HPM	Due to BRes	PCurr	% P	% Y
1873-79	10/73 - 3/79	-3.1%	-6.3%	4.2%	-1.0%	-3.8%	2.5%
1893-94	1/93 - 6/94	-5.7%	2.6%	-8.0%	-0.3%	-6.3%	-7.9%
1907-08	3/07 - 6/08	-3.8%	8.1%	-10.0%	-2.2%	-0.2%	-12.5%
1920-21	1/20 - 721	-5.3%	-6.6%	1.6%	-0.3%	-6.1%	-5.6%
1929-33	8//29 - 3/33	-43.4%	16.2%	-22.4%	-46.5%	-7.5%	-11.1%
1929-31	8/29-1/31	-5.8%	0.0%	-4.2%	-1.7%	-8.3%	-10.6%
1931-33	1/31-3/33	-37.6%	16.3%	-17.8%	-43.1%	-6.6%	-11.6%
2007-09	12/07 - 6/09	18.6%	69.9%	-51.1%	6.1%	1.1%	-2.1%

1929-33

- 1929-31 like 1893 & 1907: supply (HPM) flat, demand (BRes & PCurr) up
  - BRes↓ ($^D/_R$ ↓) & PCurr↓ ($^D/_C$ ↓) mean demand up. HPM flat, P & Y down
- 1931-33 things got *really* bad – prices & output down, economy in free-fall
  - Banks panic, want liquidity ($^D/_R$ ↓); public panics, wants C ($^D/_C$ ↓)
- 1893 & 1907 were short – 1929-33 was 4 years of falling prices & output
- Fed had power to create HPM in 1929-31 (before things got bad) *but did not*
- Banking system collapsed, economy down by 1/3, unemployment up to 25%

Why Did Fed Fail to Act?
Critical question, and no perfect answers

> The explanation ... is the shift of power within the System and the lack of understanding and experience of the individuals to whom the power shifted. (F&S p. 411)

Benjamin Strong, president of NY Fed, died October 1928 (tuberculosis)

- He had the knowledge, experience, strength of character to lead the system
- With Strong gone, power vacuum led to shift of power to DC and Board of Governors
- At that time neither skilled nor knowledgeable leaders at the Board
- Possibly one of the most unfortunate deaths of the early 20th c

> It is also true that small events at times have large consequences, that there are such things as chain reactions and cumulative forces. It happens that a liquidity crisis in a unit fraction reserve banking system [and one like the US that is fragile to begin with] is precisely the kind of event that can trigger ... a chain reaction. (F&S p. 419)

See [Friedman and Schwartz(1963)] Chapter 7 Section 7 "Why Was Monetary Policy So Inept?"

3.6 1960s: Friedman & Schwartz Revise Monetary History, Educate the Fed

Contents

1963, *Monetary History of the US* Re-writes History
Following the Great Depression, received wisdom was that monetary policy had been passive or ineffective

- Friedman & Schwartz re-wrote history
- Argued, persuasively, that money matters, and matters dramatically during a liquidity crisis

> Milton Friedman and Anna Schwartz's **A Monetary History of the United States 1867–1960** is perhaps the most influential work in economic history of the 20th century. The book, a perfect combination of historical narrative, empirical work, and theoretical analysis, was the major force in refocusing the economics profession's thinking about the importance of money in generating cyclical fluctuations. It also showed how the severity of the Great Depression was in large part due to the mistakes of the Federal Reserve.

Quote is from an advertisement for a Cato Institute book forum featuring Anna Schwartz (https://www.cato.org/events/monetary-history-united-states-1867-1960)

2002, Fed has Learned the Lessons of Friedman & Schwartz

November 2002, conference in Ida Noyes to celebrate Friedman's 90th birthday

- Friedman & Schwartz both attended, both strong and feisty
- Ben Bernanke gave one of the papers, discussing Friedman & Schwartz's analysis of the Great Contraction (as they termed it)

The end was an electrifying moment (at least as far as academic conferences go)

- Remember that Bernanke was a member of the Board of Governors, later to become Chairman

> 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 and Anna: Regarding the Great Depression. You're right, we did it. We're very sorry. But thanks to you, we won't do it again.
>
> Best wishes for your next ninety years.

[Bernanke, Ben and Board of Governors of the Federal Reserve System (U.S.)(2002)]

3.7 2008: Federal Reserve (& Bernanke) Save the Financial System

Contents

2008, Fed Injected Liquidity, Saved the World

Date	NBER Pk/Tr	%Ch Mon Stock	HPM	Due to BRes	PCurr	% P	% Y
1873-79	10/73 - 3/79	-3.1%	-6.3%	4.2%	-1.0%	-3.8%	2.5%
1893-94	1/93 - 6/94	-5.7%	2.6%	-8.0%	-0.3%	-6.3%	-7.9%
1907-08	3/07 - 6/08	-3.8%	8.1%	-10.0%	-2.2%	-0.2%	-12.5%
1920-21	1/20 - 721	-5.3%	-6.6%	1.6%	-0.3%	-6.1%	-5.6%
1929-33	8//29 - 3/33	-43.4%	16.2%	-22.4%	-46.5%	-7.5%	-11.1%
1929-31	8/29-1/31	-5.8%	0.0%	-4.2%	-1.7%	-8.3%	-10.6%
1931-33	1/31-3/33	-37.6%	16.3%	-17.8%	-43.1%	-6.6%	-11.6%
2007-09	12/07 - 6/09	18.6%	69.9%	-51.1%	6.1%	1.1%	-2.1%

2007-09

- Fed did learn, did the right thing
- Massively increased HPM – Quantitative Easing (QE1)
  - Mainly went to bank reserves
- Banks were panicked, increased reserves ($^D/_R \downarrow$)

Can't say for sure what would have happened, but 1907 and 1930s give us a pretty good idea

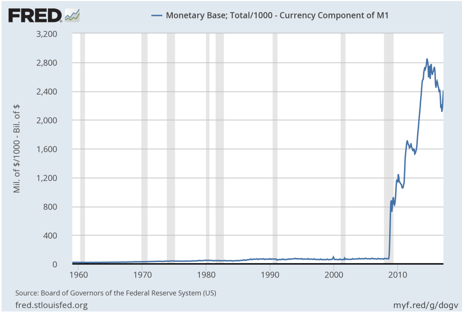
- If the Fed hadn't done QE1, the financial system would probably have collapsed
- NB: prices for 2008:Q3 - 2009:Q1 fell by 4.1% (ann). Extraordinary

%P for 2007-2009 is Personal Consumption Expenditures (DPCERD3Q086SBEA on FRED) from 2007:Q4 to 2009:Q3. In fact, for 2008:Q3 to 2009:Q1 inflation was -4.1%. Extraordinary

%Y is (GDPC1) 2008:Q3 - 2009:Q1.

Reserves – The Fed Did Indeed Learn

And the Fed did learn. They increased reserves in 2008. By just a little!



Monetary Base – Currency (BOGMBASE/1000 – CURRSL)

At the time, concern about inflation (from MV=PY). Reasons not:

- Increased *demand* for money
- Fed pays interest on reserves

Some Things I've Ignored – But Main Story Correct

I've ignored and glossed over some things:

- Since 1990s, US banking system has become national
  - Can now open Chase account in Illinois, not just NY
- Reasons for 2008 crisis not quite the same as 1907 & 1930s (fragile & fragmented banking system)
  - New story of political / banking coalition that led to mis-pricing and over-consumption of mortgage risk
- Fall 2008 Fed started paying interest on reserves – another big reason for "no inflation" with big increase in reserves

4 Conclusion: Friedman & Monetary Theory

Contents

***Monetary History* One Part of Friedman's Contribution**

I've talked today about Friedman & Schwartz's *Monetary History of the US*

- The data, theory, and analysis – the history of 1907 and the 1930s – teaches us about 2008. And possibly the next crisis

But only one part of Friedman's contributions to monetary theory

- Quantity Theory & Velocity: $MV = PY$
- Understanding of the sources and cures for inflation: "Inflation is always and everywhere a monetary phenomenon"
- Monetary policy and central bank bank policy

I'm not saying Friedman's monetary theory is always correct

- In fact I think the recent work of Eric Leeper, John Cochrane, others on "Fiscal Theory of the Price Level" updates Friedman's quantity theory

But Friedman & Schwartz's work has endured and has immense current relevance

References

[Bagehot(2012)] Walter Bagehot. *Lombard Street - A Description of the Money Market*. CreateSpace Independent Publishing Platform, December 2012. ISBN 978-1-4818-1829-2.

[Bernanke, Ben and Board of Governors of the Federal Reserve System (U.S.)(2002)] Bernanke, Ben and Board of Governors of the Federal Reserve System (U.S.). On Milton Friedman's Ninetieth Birthday: Remarks before the Conference to Honor Milton Friedman, University of Chicago, Chicago, Illinois, November 2002. URL `https://www.federalreserve.gov/BOARDDOCS/SPEECHES/2002/20021108/`.

[Calomiris and Haber(2015)] Charles W. Calomiris and Stephen H. Haber. *Fragile by Design: The Political Origins of Banking Crises and Scarce Credit*. Princeton University Press, reprint edition edition, August 2015. ISBN 978-0-691-16835-7. In Bookstore.

[Economist()] Economist. Financial crises. URL `http://www.economist.com/news/essays/21600451-finance-not-me` Free On-line.

[Friedman()] Milton Friedman. Methodology of Positive Economics.

[Friedman(1968)] Milton Friedman. The Role of Monetary Policy. *The American Economic Review*, 58(1):1–17, 1968. ISSN 00028282. URL `http://www.jstor.org/stable/1831652`.

[Friedman(1976)] Milton Friedman. Inflation and Unemployment. Sweden, December 1976. URL `https://www.nobelprize.org/prizes/economic-sciences/1976/friedman/lecture/`.

[Friedman and Schwartz(1963)] Milton Friedman and Anna Jacobson Schwartz. *A Monetary History of the United States, 1857-1960*. Princeton University Press, Princeton, NJ, 1963.

[Moen and Tallman(1992)] Jon Moen and Ellis W. Tallman. The Bank Panic of 1907: The Role of Trust Companies. *The Journal of Economic History*, 52(3):611–630, 1992. ISSN 0022-0507. URL `https://www.jstor.org/stable/2122887`.

[Moen and Tallman(2015)] Jon R. Moen and Ellis W. Tallman. The Panic of 1907 | Federal Reserve History, December 2015. URL `https://www.federalreservehistory.org/essays/panic`$_of_1$907.

[Odell and Weidenmier(2002)] Kerry A Odell and Marc D Weidenmier. Real Shock, Monetary Aftershock: The San Francisco Earthquake and the Panic of 1907. Working Paper 9176, National Bureau of Economic Research, September 2002. URL `http://www.nber.org/papers/w9176`.

[Phelps(1967)] Edmund S. Phelps. Phillips Curves, Expectations of Inflation and Optimal Unemployment over Time. *Economica*, 34(135):254–281, 1967. ISSN 0013-0427. doi: 10.2307/2552025. URL `https://www.jstor.org/stable/2552025`.

[Phelps(1968)] Edmund S. Phelps. Money-Wage Dynamics and Labor-Market Equilibrium. *Journal of Political Economy*, 76(4):678–711, 1968. ISSN 0022-3808. URL `https://www.jstor.org/stable/1830370`.

[Tallman and Moen(1990)] Ellis W. Tallman and Jon R. Moen. Lessons from the Panic of 1907. *Economic Review - Federal Reserve Bank of Atlanta; Atlanta*, 75(3):2, June 1990. ISSN 07321813. URL `http://search.proquest.com/docview/200421818/abstract/392E06AC8B044B5PQ/4`.