

A Professor's Tribute to a Prize Student

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Shadow Open Market Committee Meeting
Princeton Club, New York City
March 6, 2020

E21 Manhattan
Institute

ECONOMIC POLICIES FOR THE 21ST CENTURY

Current Monetary Policy: The Influence of Marvin Goodfriend

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It is a great pleasure to be here with so many long-time friends—note carefully, I am not saying *old* friends—to honor the memory and contributions of Marvin Goodfriend. He was a student of mine at Brown University and over the years we kept up our relationship. In 1984, I was able to bring him to the Council of Economic Advisers for a year as a senior staff economist.

I'll discuss two of Marvin's papers. One was a fine and lasting contribution and the other, I believe, was fundamentally off track. Lest I be misunderstood, I am well aware that I have published some not-so-great papers myself. It is not a criticism of a scholar that he tries out an argument and explores it in detail. I did not try out my criticism face to face with him and regret not doing so. That said, I am going to be picking on Marvin because the topic is so very important to current policy debates.

Monetary Mystique

The first paper I'll discuss was a careful review of the Federal Reserve's arguments concerning secrecy: "Monetary Mystique: Secrecy and Central Banking," published in 1986.¹ David R. Merrill, a student at Georgetown University Law Center had sued the Board of Governors under the Freedom of Information Act. The Fed resisted; Marvin reviewed the various arguments the Fed offered in Federal District Court and, after losing, the Federal Court of Appeals which upheld the District Court decision. Marvin's paper is noteworthy because discussion of Fed communication strategy continues to this day. The issue now is less one of secrecy and more one of what the Fed should say and do to communicate clearly. Marvin's paper is a must-read for anyone interested in this topic

Marvin's work on the Merrill case was directly relevant to the Bloomberg L.P. FOIA suit to force Federal Reserve disclosure of the names of the firms the Fed supported during the financial crisis. His paper is not mentioned in the Federal District Court opinion nor the Appeals Court opinion, but it should have been. I have not been able to find the Bloomberg L.P. briefs submitted to the courts, but it would have been natural for the briefs to have discussed Marvin's paper on the Merrill case.

This paper is highly relevant to the larger topic of clear central bank communication with the markets. Here, let me also point to the paper Charlie Plosser delivered at the SOMC meeting a year ago and the discussions earlier today.

The federal funds rate has been the policy target for decades. Something would seem amiss when the Fed cannot deliver the rate promised, as has happened on

¹ *Journal of Monetary Economics*, January 1986. The paper was gutsy. Marvin was at the Richmond Fed and Chairman Volcker fought the FOIA request vigorously.

occasion recently. Why not adopt a corridor system, as Charlie Plosser discussed a year ago? It is not rocket science. The Fed offers to pay a rate on reserves in unlimited amount to any entity qualified to maintain an account at a federal reserve bank. That anchors the bottom of the fed funds rate range. The Fed also can also set an interest rate at which it will lend an unlimited amount to all comers against high-quality collateral specified in advance. That anchors the upper end of the fed funds rate range. Once the Fed has explained clearly and in detail what collateral it will accept, the policy administers itself.

Some will claim that Fed payment of interest to foreign entities that hold balances at the Fed is horrible. It may be a political risk because of the ignorance of those who want to bash the Fed, but that is foolishness. The Treasury pays billions in interest every year to foreign entities holding Treasury securities.

It is important to understand that the fed funds rate targets and the realized rate itself are important for firms on and *off* Wall Street. Many firms make decisions based in part on the outlook for Fed policy. They need not have any interest in the minutiae of Fed policy, but they do observe obvious events such as changes in the target range and a funds rate outside the range. These are often front-page news.

Should further analysis indicate that a wider target range would be useful, then that can be done. A wider range for the funds rate might serve as a shock absorber and might relay useful information to the Fed. My caution would be that the Fed should explain the rationale before acting. I have no view on whether a wider range would be a good idea.

A central point is that market behavior beyond the fed funds and repo markets depends on how the Fed designs its strategy. A hedge fund, for example, trading in several markets may need to have confidence in whether it can or cannot execute a repo at the end of the day to protect its positions. The same for a commercial real estate firm buying and selling property. Without some formal analysis we cannot be sure, but I'll hazard a guess that stabilizing speculation in other asset markets is more likely if speculators can count on being able to execute repos at a price close to the upper end of the fed funds target range than if they are left with uncertainty about Fed interventions. I do not use "speculator" in a pejorative sense as so many do. Asset markets are inherently about the future.

The Fed began to raise target rates in December 2015. At each subsequent increase of 25 basis points in the upper and lower end of the announced target range the Fed increased the interest rate paid on reserves by 25 basis points. A regular, predictable connection between the target range and the rate paid on reserves. Repeated five times.

In June 2018 the FOMC raised the target range again by 25 basis points. But now the Fed increased the interest rate paid on reserves by 20 basis points. What was that all about? The statement released at the end of the meeting explains: "Setting the interest rate paid on required and excess reserve balances 5 basis points below the top of the target range for the federal funds rate is intended to foster trading in the federal funds market at rates well within the FOMC's target range."

If I were a Fed watcher, what would I make of this change in the regular connection between the interest rate paid on reserves and the target range? Does it change my prediction for the interest rate on reserves the next time the Fed changes the target funds rate? Has the Fed ever spoken in riddles in the past? Has it ever sent

messages in code before? Can five basis points really have any significant effect? Will the margin be 10 basis points next time? I think Marvin and I would have agreed that in an era of heightened Presidential willingness to interfere with Fed policy it is very important not to risk any appearance that Presidential commentary on Fed policy is somehow influencing what the Fed does.

The Fed, it seems to me, does not properly understand the cause of the spike in money-market rates that took the repo rate temporarily to 10 percent last September. The explanation of the “ample reserves” policy doesn’t make much sense.² The only reason the rate the Fed *pays* on reserves would have anything to do with keeping the actual rate *below* the *top* of the range is that there are entities such as the GSEs eligible to hold reserves at the Fed that are not eligible to receive interest on the reserves.

Asymmetries. There are two asymmetries in the current system, neither of which is corrected or offset by the ample reserves policy. One is that some account holders at the Fed are eligible to be paid interest and others are not. Thus, there is an obvious arbitrage opportunity; both those receiving interest and those not eligible have an incentive to work deals so that the non-eligible firms get some interest and others get higher interest than if they simply let reserves sit at the Fed. The higher the Fed pushes its funds rate target the higher will be the arbitrage incentive. This asymmetry is the obvious cause of the tendency for the funds rate to sometimes trade below the lower end of the target range.

The second asymmetry is that the bottom end of the funds rate range is anchored by interest on reserves but there is no anchor at the top end. In principle, the discount rate anchors the top end but not effectively anymore. With a two-year lag, the Fed discloses the names of banks that borrowed at the window. Horrors! A bank “*had to*” go to the window for a *last-resort* loan from the Fed. At the bottom end, banks can adjust their reserves earning interest in almost any amount on any notice, guaranteeing that the funds rate in the market will not fall much below the bottom end of the target range for a sustained period.³ At the top end, banks and other money-market firms must figure out how to manage their funds flows without the assurance that the amount they may pay in the fed funds or repo markets are capped in any fashion. There is no guarantee that the Desk at the New York Fed will supply just the right amount of reserves at just the right time all the time.

As the FOMC raised the target range, the ineligible entities had a rising incentive to find a way to convert reserves earning a zero rate into assets earning a higher rate. They might do so by exercising repurchase agreements with banks that could earn interest on the reserves and pass some along to the GSEs. Because, for example, of the vicissitudes of GSE funds flows in issuing MBSs, pressures in the federal funds market are unlikely to be as consistently related to traditional operating factors such as float, currency drains and changes in Treasury balances at the Fed as they had been before the crisis. Thus, there can be surprise strains in the money market that the Fed has no way of predicting or understanding.

² See, for example, John C. Williams, “Money Markets and the Federal Funds Rate: The Path Forward.” Speech delivered October 17, 2019.

³ The funds rate can trade a bit below the interest rate the Fed pays on reserves because regulatory capital requirements are assessed on fed funds assets on a bank balance sheet but not on reserves held at the Fed.

Increasing the quantity of reserves will not change the fact that entities holding reserves not earning interest will have an incentive to arbitrage with entities that are earning interest.

If you go back to Marvin's 1986 paper, you will see extensive passages quoted from the claims that senior staff members made to the courts defending Fed secrecy. As Marvin pointed out, many of these statements were inconsistent one with another and with economic theory. It would not be hard to conclude that the Fed was reaching for arguments that might work with judges who did not know much about economics. However, it is a dangerous game for the Fed to be disingenuous with observers who do understand the details in detail.

Coronavirus Lessons. The reason for my plea for a Fed policy that is as regular and predictable as possible is nicely illustrated by market strains caused these days by the coronavirus. Now we are facing one of the most serious uncertainties the Fed has ever faced.

Can the level of interest rates have any effect on the pace of discovery and production of a vaccine to deal with coronavirus? Obviously not, as Chairman Powell made clear in his press conference a few days ago. Perhaps the rate cut this past Tuesday is a way for the Fed to say, "we see the problem and we care. We will do everything we can to make the market environment as stable and predictable as possible so that private markets can deal with the negative effects of the virus as efficiently and effectively as they can."

At any given time, some firms may be dealing with pressures as some clients move funds into or out of certain investments. To illustrate, my local hospital in rural Cecil County, MD may have to bring in specialized nurses and house them for some weeks. Or, it may have to send certain patients to The Johns Hopkins Hospital—one of the best in the world—in Baltimore. Firms across the country need assurance that they can borrow from banks as needed, without waiting for Federal Reserve approval.

The financial system must run automatically so that decentralized market decisions can cope as best as possible with what could turn out to be a full-fledged emergency. Banks need to have full confidence that they can deal with surprise and thoroughly unpredictable pressures without waiting for the Fed to give its approval. There is every reason for the Fed to make the system as simple and automatic as possible for all participants; that is one of the things a properly specified corridor system could do.

Marvin Goodfriend fully understood the case I am making and the reasons for it. He contributed to this important literature.

Unencumbering Interest Rate Policy

The second paper—"The Case for Unencumbering Interest Rate Policy at the Zero Bound"⁴—was not a success in my view. It was technically interesting in some respects but was fundamentally off base. The problem was, and remains in much policy discussion today, that monetary policy cannot solve a non-monetary problem. The zero-rate and quantitative easing discussions imply that there is monetary fix for every problem that arises in the real economy.

⁴ Federal Reserve Bank of Kansas City Symposium, Jackson Hole, August 2016.

It is important to distinguish the Fed's initial large purchases of assets during the 2008-09 financial crisis from the later editions of quantitative easing. After Lehman's failure, there was a world-wide rush to buy *the* safe asset—a claim on the U.S. Government. These claims were the gold-standard of safe assets—better than gold itself. The only way to increase the aggregate quantity of such assets available to the market quickly was for the Fed to buy or guarantee assets.

Once past the recession trough in 2009, it did not seem to me that quantitative easing was likely to be effective and that it did run some risks. I agree with Charlie Plosser's paper at the SOMC a year ago and Esther George's paper that you have just heard.

Evidence Matters. Suppose you had administered a two-part questionnaire in 1960 on the Great Depression to an audience like this one. The first part asks you about what you think your views would have been in late 1930 on what is causing the sharp decline in economic activity. The second part would ask you what your policy recommendations would have been in 1930 given your analysis of what is happening. Now repeat the exercise in 1980 with the exact same questions. The answers would have been dramatically different, because the audience would have absorbed the Friedman-Schwartz *Monetary History*. In 1960, some might have recommended the ban on interest on checking accounts and Reg Q ceilings on time and savings accounts. Would that recommendation still be around in 1980?⁵

Now consider a similar questionnaire on the financial crisis administered in June 2009—which was later determined to be official cycle trough—and again the identical questionnaire in June 2019. The part 1 questions include some on the causes of the crisis. Let me assume that before the 2019 questionnaire you have been instructed to read four books, all of which appeared after 2009. One is Bethany McLean and Joe Nocera, *All the Devils Are Here: The Hidden History of the Financial Crisis*, which appeared in 2010; a second is Gretchen Morgenson and Joshua Rosner, *Reckless Endangerment: How Outsized Ambition, Greed, and Corruption Led to Economic Armageddon*, which appeared in 2011; a third is Charles Calomiris and Stephen Haber, *Fragile by Design: The Political Origins of Banking Crises and Scarce Credit*, which appeared in 2014; a fourth is Peter Wallison, *Hidden in Plain Sight: What Really Caused the World's Worst Financial Crisis and Why It Could Happen Again*, which appeared in 2015. If you are an advocate of the speculative bubble, Wall-Street-did-it theory, I'll wager that after reading these books your view will be different. Your answers on a 2019 survey will differ from those you would have given on a 2009 survey.

My objection to Marvin's "Unencumbering" paper is that he offers a policy prescription without a clear statement of why the recovery was so slow after the cycle trough. Positive economic analysis is critical to getting the policy prescription right, as the two examples just discussed show.

I believe that the slow recovery after 2009 had nothing to do with monetary policy and could not be fixed with a monetary policy remedy. The basic problem was slower than expected recovery in business fixed investment. Interest rates were low,

⁵ The Friedman-Schwartz *Monetary History* changed understanding of the Great Depression in multiple ways. The stock market decline was a consequence, not a cause. Nor did joint ownership and management of commercial and investment banks have anything to do with the Great Depression. Nor did payment of interest on deposits. Some of the reform legislation of the 1930s was useful; some was irrelevant and even harmful.

providing a great opportunity to accelerate long-lived capital investment projects. Why did that acceleration not occur? In December 2013, the FOMC staff projected GDP growth rates for 2014, 2015 and 2016 of 3.1%, 3.5% and 3.4%, respectively. In December 2014, the projections for these three years were 2.2%, 2.5% and 2.7%, respectively. A major reason for the downshift in projected growth was the failure of business fixed investment to respond to the historically low interest rates.

I have reviewed all the Fed Beige Books for 2014, the latest year these materials are available to the public. Despite evidence that business investment was not responding as expected, the Fed made no effort to use its industry contacts to find out why. In the past, the Fed sometimes had a special question put to all the contacts. Not in 2014.

Searching for the term “investment” in the Beige Book turned up a few hits, but not many. There was no effort to distinguish a firm’s investment in existing capital from investment as it enters the national income accounts. Would it not have made sense to determine why investment in new capital was not responding to historically low interest rates? My complaint about Marvin’s “Unencumbering” paper is that he missed an opportunity to investigate the slow investment response. It is as if a physician simply ups the dosage on a drug rather than finds out why the patient is not responding.

Regulatory Burden.⁶ To understand why an investment boom did not occur, at least in part, spend ten minutes on two documents relating to the redevelopment of the abandoned Bethlehem Steel works facility at Sparrows Point, MD. First, skim the 269-page EPA document “SETTLEMENT AGREEMENT AND COVENANT NOT TO SUE SPARROWS POINT TERMINAL, LLC.” After several changes in ownership, the company that eventually owned this contaminated industrial site had plans to redevelop it but needed protection from an EPA suit to do so. The threat of EPA suits has slowed redevelopment of contaminated sites for years. Second, look at the EPA document “Public Informational Meeting on the Former Sparrows Point Steel Mill Environmental Cleanup, October 3, 2019.”

The first document will provide a taste of the legal complexity of restoring contaminated industrial sites, and the second a taste of the technical complexity of doing so. This project could have proceeded much more quickly if the EPA had a larger staff of inspectors and of officials who could approve each stage of the remediation process. The EPA has no commercial incentive to seeing that projects proceed quickly; its interest is in avoiding possible political embarrassment from making mistakes, or what some may deem mistakes. Monetary policy cannot fix this problem and examining new monetary wrinkles can only distract attention from the real problems. I can provide several specific anecdotes of this kind—remember how the Obama administration

⁶ I have spent only a small amount of time searching the literature on the macro effects of regulation. The Mercatus Center devotes substantial resources to this topic. See also a 2017 paper by Germán Gutiérrez and Thomas Philippon prepared for the Brookings Papers on Economic Activity and several papers prepared for the Kansas City Fed Symposium in 2018.

blocked the Keystone XL pipeline?—and the aggregate evidence in the national income accounts of slow investment.^{7, 8}

It makes sense to combine case studies like Sparrows Point with more formal modeling and estimation of parameters. For one thing, land creation is not usually a part of a formal investment model. The essence of the Sparrows Point project is to return land to productive use.

Think about the regulatory apparatus in effect today—the entire set of regulations, procedures, court interpretations and the like. Suppose this entire apparatus had been put into effect, all at once, 50 years ago. Wouldn't macroeconomists have been talking of a gigantic supply shock? How much does it matter that the current regulatory environment arrived through a trickle down drip-by-drip process rather than all at once? Learning processes and adjustment costs surely make some difference, but how large a difference? Perhaps only an old man can *feel* the difference between 1970 and 2020.

I studied macroeconomics at Chicago under Martin J. Bailey. His textbook, *National Income and the Price Level*, continues to occupy a spot on my bookshelf where I can reach it easily. Bailey argued that the secular stagnation thesis coming out of the Great Depression could not be correct. He argued—and offered calculations in the appendix—that there are some investments available that have an infinite, or very long, life. The best example was, and perhaps remains, land creation. Visit the Netherlands and you will understand. Or, study the potential from redeveloping Sparrows Point.

Land, once created, lasts forever. In Holland, there are some upkeep costs—dikes, pumping stations and the like. As long as these costs are met, the land lasts indefinitely. Each year, the return from the land net of operating costs is positive. The indefinitely long stream of future returns has a present value that becomes larger and larger as the

⁷ If you have an interest in understanding regulatory impediments to economic growth, spend time on the websites maintained by the Environmental Protection Agency and the Federal Energy Regulatory Commission. When threatened by terminal boredom, try the website for the Army Corp of Engineers, which regulates waterways, dams and canals.

⁸ Here is a crude look at aggregate evidence, concentrating on long expansions and using annual data from the St. Louis Fed's FRED database. The appropriate aggregate series is *Contributions to percent change in real gross domestic product: Gross private domestic investment: Fixed investment: Nonresidential, Percentage Points at Annual Rate, Annual, Not Seasonally Adjusted*. Let's examine long expansions using years not including the years of business cycle peaks and troughs. The numbers following the years are averages of percent changes for the years indicated (inclusive). 2010-19: 0.62%; 2002-2006: 0.39%; 1992-2000: 1.19%; 1983-89: 0.59% [excluding 1986-87 from this expansion because the breakdown of OPEC led to a sharp reduction in oil prices and energy investment in the U.S. yields an average of 0.87%]; 1962-68: 0.88%. This approach is crude for several reasons. For one, we should view the annual average as centered in the middle of the year. The 1982 trough was the fourth quarter whereas the 2009 trough was second quarter. The 1991 trough was first quarter. An important task for the Fed after the 2009 trough should have been to understand why low interest rates were not having the effects observed in prior years rather than how to invent new policy instruments. I realize that excluding observations such as 1986-87 to "prove" a hypothesis is a dangerous practice. All told, we might reasonably have expected business fixed investment to have contributed about 25 basis point more growth each year than it actually did 2010-19. Based on the most recent estimates, in 2019 actual nonresidential fixed investment in nominal dollars was \$2,878 billion. A boost of 25 basis points of GDP would have *increased* that figure by \$5,357 to a total of \$8,235.

real interest rate approaches zero. Thus, the present value will exceed any—emphasis on *any*—finite cost of construction at a low enough rate of interest. At a zero real interest rate, using language mathematicians hate, the present value of a project with positive annual returns and an indefinite life is infinite. There can be little doubt that the real rate of interest applying to business investment is very low and perhaps zero in Switzerland, Germany and some other European countries. Perhaps below zero, even.

Consider 10-year government bond yields as of this past December to avoid complications from coronavirus. The 12-month average for the U.S. inflation-protected bond was 40 basis points; for Switzerland, minus 49 basis points; for Germany, minus 25 basis points; for France positive 13 basis points. Why have we not seen a boom in construction of long-lived investments such as pipelines, long-distance electrical transmission towers, flood-control dams, pumped storage hydroelectric facilities and high-rise office and residential buildings? Don't forget that the Empire State Building opened in 1933—almost a century ago—and still seems to be an iconic address.

Keynes's Mistake. Keynes made the original mistake. After discussing pyramid-building and other wasteful ways of creating employment, he says this:

“If I am right in supposing it to be comparatively easy to make capital-goods so abundant that the marginal efficiency of capital is zero, this may be the most sensible way of gradually getting rid of many of the objectionable features of capitalism. For a little reflection will show what enormous social changes would result from a gradual disappearance of a rate of return on accumulated wealth.” (Keynes, John Maynard. *The General Theory of Employment, Interest, and Money* (p. 135). Kindle Edition.)

It is not “comparatively easy.” It is impossible. Is it conceivable that humans will ever have so much capital that they will want no more? Won't there be people who want a yacht, or a larger yacht? Who can imagine a world in which every American has as much land around his house as he wants? Don't many of us want a bit more space, or a condo in the Caribbean? Or an oil painting by a famous artist on the wall? Or an expensive vacation in an exotic place? A basic principle taught in econ 101 is that needs, wants and desires are unbounded whereas resources are always bounded. I well remember this principle from the early chapters of Samuelson's textbook when I took my first course in economics in the fall of 1955.

If there is a positive return from rent on a long-lived mansion, say, in a warmer climate, then the value of developing the property rises toward infinity as the interest rate goes to zero. It really is just that simple. Or, almost. I have already discussed Sparrows Point and the difficulty of actually building a promising investment.

Besides the mansion on a tropical island somewhere, are there other sorts of projects available today with indefinite life or at least very long life of the sort Bailey discussed? The answer unambiguously is yes. In many countries, including the United States, Germany, Japan and others there are contaminated industrial sites like Sparrows Point waiting to be cleaned up. They sit next to property that trades at positive market prices. Why aren't the contaminated sites being cleaned up at a fast pace? The answer has nothing to do with the interest rate.

In Baltimore, there are slum dwellings—row houses over 100 years old—that sell for prices as low as \$3,000. Walking distance away are other properties that sell for

prices in excess of \$150,000. Why are developers not buying the cheap properties, tearing down the houses, many of which are abandoned derelicts, and building new ones that would have a useful life of 50 or more years? The reason has nothing whatsoever to do with the interest rate.

We know what the problem is. Baltimore has a poor school system and a high crime rate. City streets are a mess. It not a bad idea to drive an off-road vehicle, designed to deal with rocky terrain, when fighting Baltimore potholes. The infrastructure is decaying. Not fun to step out your front door and find the street flooded from a water-main break. Cities across America suffer the same ills. Don't get me wrong. I lived in Baltimore for six years and like the city. In many respects it lives up to its moniker "charm city."

Why are German companies, for example, not borrowing at a near-zero interest rate and contracting with governments in sub-Saharan Africa to build toll roads between city pairs that have substantial traffic? Once built, the right-of-way of a highway lasts forever. There are some operating costs such as clearing rockslides from time to time and replacing worn pavement. But the right of way—the tunnels through mountains and the like—lasts forever. In the 19th Century, European investors helped to finance the westward expansion of the United States. Why not the same process in Africa?

The reason German investors are not building roads in Africa has nothing to do with the level of the interest rate. The problem is security of the property. Once built, the state or the glorious leader may confiscate it. Schemes to make the interest rate more deeply negative are irrelevant. That is why I think Marvin's paper on interest rates is unsuccessful—he did not direct his great talent to the real issue.

When I presented this argument to a friend not long ago the reply was that companies cannot borrow at the low rate on German bonds. That argument seems not quite right because any firm with German bonds in its portfolio can sell them to raise cash. The opportunity cost of doing so is zero percent per year, or less, at least as a first approximation. Of course, there is risk to be considered. That said, a project that has a present value close to infinity leaves a lot of room to absorb risk! More than that, we know what the risk is. With insecure property rights the investment may be stolen. We know what the solution is. Establish firm property rights. But how? A lower interest rate won't help.

Bailey's argument, stated in his text, is incomplete in two respects. One is that the entrepreneur must be able to get permits and the like to be able to tear down 100-year old row houses in Baltimore. Protestors may object. After all, there are very poor people living in some of these houses, between the ones that have been abandoned. The City of Baltimore owns many of the houses, which happens as it takes title when taxes are not paid. It ought to be possible for a developer to work deals with politicians, but it ain't easy. Or the EPA may bog down the project. Or Sierra Club suits may slow everything down. Baltimore is a city in steep decline; the politics are dysfunctional and the management skills weak. That is the problem; the interest rate is irrelevant.

The second thing missing from Bailey's analysis is a careful discussion of the value of a durable asset once built. Bailey just assumes the asset has value or entrepreneurs wouldn't build it. To provide an example, consider the Concorde supersonic passenger aircraft. Reading the Wikipedia article on the Concorde, you realize the complexity of the design and testing process. Twenty aircraft were built. The Concorde was in service for 27 years, starting in 1976. The asset is the knowledge of

how to build and operate such a complex plane. But operating the Concorde was not profitable for a variety of reasons, one of which was very high fuel consumption. The present value at a zero interest rate of a project that loses money every year forever is infinitely negative! So, the Concorde was withdrawn from active service in 2003. It is now a handsome museum artifact.

That is the problem of some of the infrastructure projects in Japan. The projects did not yield a return over operating cost. The Liberal Democratic Party chose projects that construction firms would enjoy building rather than projects that have a net positive cash flow once built. LDP politics in Japan are dysfunctional.

In the United States, law forbids tolls on interstate highways built with federal funds. Remove that constraint, permit states to establish turnpike authorities and we will before long see a massive amount of highway reconstruction. The turnpike authorities will sell revenue bonds as necessary to finance new construction, just as in an earlier day the New Jersey turnpike authority did.⁹ Bingo! The large volume of bond sales will raise interest rates to a more normal level as observed historically. Legal restrictions will establish clear property rights by requiring that tolls collected service the bonds. I am not talking about a wild speculation. We've been there. We are still there. In recent years, Maryland has built new roads financed by tolls collected using transponders.¹⁰

The scholarly (and not so scholarly) literature on the financial crisis suffers from two major misconceptions. One is an effort to view the housing bubble in the same way as the surge in the stock market in the late 1990s. "Bubble conviction," if I may use that term arises from a powerful confirmation bias. This bias is well discussed in the psychology literature.

When an observer is convinced of an explanation, there is a strong tendency to see every event as confirmation of the hypothesis and not to be open to other hypotheses. That is the way I view the 2015 edition of Robert Shiller's book, *Irrational Exuberance*.¹¹ By 2015 there was an enormous literature on the 2008 crisis and, apparently, Shiller never looked at any of it. That is a reasonable conclusion when the

⁹ An entry in *ExplorePAhistory.com* explains that the Pennsylvania turnpike, which opened in 1940 and was ahead of the New Jersey Turnpike, was built with federal funds. Thus, given the state of the federal budget at that time, the funds to build the Pennsylvania turnpike were 100% borrowed at a relatively low interest rate. Initially, the turnpike had no speed limit. A Poole family legend has it that one of my uncles drove the highway shortly after it opened racing the crack train, the Broadway Limited, from Philadelphia to Chicago, and beat the train! This highway was a very productive investment, crossing some difficult country through the Alleghany Mountains, cutting the travel time from Harrisburg to Pittsburgh in half. *In half*. How is that for a productive investment! The highway was built on the abandoned right-of-way of the South Pennsylvania Railroad; so, even that far-sighted but failed investment turned out to have a high social return. The Pennsylvania Turnpike was the design prototype for the Interstate System that came later. The New Jersey Turnpike, with first section built in 1949, was easily financed by revenue bonds. The original plan was to remove the tolls when the bonds were all redeemed, but that never happened as new bonds were sold to finance improvements, operating costs and policing.

¹⁰ However, there is intense opposition to building more toll roads in Maryland. The Maryland legislature, with a large Democratic majority, wants to discredit Governor Hogan, a Republican, by whatever means the Democrats believe might be effective politically. The interpretation of the politics is mine, but to read a description of the issue see, Baruch Feigenbaum, "The Misguided Efforts to Derail Maryland's I-270 and I-495 Toll Projects," Reason Foundation, February 14, 2020. The Reason Foundation has been covering transportation and tolling issues for many years.

¹¹ Shiller's argument is primarily psychological, but the term "confirmation bias" never appears.

reader looks at the index in the book and the works cited. Remarkably, there is no citation to the *Financial Crisis Inquiry Commission*, which presented its report in early 2011. Nor does Shiller mention the 2013 book by Peter Wallison, *Bad History, Worse Policy*. We can excuse Shiller for not being familiar with Wallison's more thorough book, *Hidden in Plain Sight*, which did not appear until 2015. However, the other books I mentioned earlier were available to him.

The essential point is that we need to examine the data to be sure that our hypothesis about the cause of an event is correct. That is why the Friedman-Schwartz *Monetary History* changed the diagnosis of what caused the Depression and what should be done to avoid a repeat event. We need the correct diagnosis to be able to prescribe the correct policy medicine. Policy and attitudes today remain shackled to incorrect views about the crisis. The reasons the economy has not responded to monetary stimulus are poorly understood.

Let's look a bit further at the 2008 crisis and its aftermath. Shiller did not, apparently, examine the data on the 2008 crisis. Without question, Lehman and some other firms screwed up. How large were they relative to the GSEs? A quick look at the Fed's Z.1 release, *Financial Accounts of the United States*, yields a quick and dirty calculation. (Data that follow are from the Z.1 report issued March 8, 2012; the same reports issued in 2008 yield essentially the same conclusion.) At the end of 2007, at the business cycle peak, credit market debt owed by the GSEs, including outstanding MBSs, was \$7.375 trillion whereas debt owed by ABS (asset-backed securities) issuers was \$4.545 trillion. These securities included the much criticized mortgage CDOs and CLOs, typically divided into tranches. The GSE liabilities were almost entirely secured by mortgages while the ABS issues were secured by mortgages, credit-card debt, auto loans and perhaps other paper as well. In the Z.1 table L.126, the assets clearly identified as mortgages total \$2.942 trillion, which includes commercial mortgages. The GSE liabilities—2½ times as much—were almost all issued against home mortgages plus some multifamily apartment buildings.

The second misconception is to believe that some screwy securities sold by investment banks brought down the financial system. Scale matters: no observer should have missed the fact that the Treasury took Fannie and Freddie into conservatorship in September 2008, before Lehman declared bankruptcy. The GSEs were almost certainly insolvent at the end of 2007—at the business cycle peak before employment had declined by much! They were insolvent because they had purchased too many subprime mortgages, which began to fail in 2006 when house prices stopped rising.

With the information at hand, we do not need theories of bubble behavior to explain what happened. The GSEs existed to harvest votes for politicians and dollars for their managements. We need neither esoteric new monetary policy strategies nor Dodd-Frank enhanced regulation to deal with a possible repeat event. We need to reform U.S. housing policy. The total GSE contribution to inflating the house-price bubble was at least 2½ times the private contribution. That was the problem.

I emphasize the GSE contribution to inflating the house price bubble, as does Peter Wallison, for two reasons. One, we do not need a psychological theory of bubbles to understand what happened. The house-price bubble was very different from the stock market boom in the late 1990s. Two, we do not need a new monetary policy instrument to deal with a potential future house-price bubble. We need lasting reform of U.S.

housing policy. Inventing new policy instruments without dealing with the fundamental problem is not helpful, because it distracts attention from what needs to be done.

I regret that I never had this conversation with Marvin. I would have learned a lot, and I might have pushed his research, as I see it, in a more rewarding direction. I'll guess that he would have agreed with me that taking the legislative branch off the hook by promising a monetary fix has not been helpful. I treasure the memory of the conversations we did have; no professor could ever have asked for more from a fine student, a fine scholar and, put simply, a great guy to be around.