CONTEMPORARY ECONOMIC POLICY

BEN BERNANKE AND THE ZERO BOUND

LAURENCE BALL*

From 2000 to 2003, when Ben Bernanke was a professor and then a Fed Governor, he wrote extensively about monetary policy at the zero bound on interest rates. He advocated aggressive stimulus policies, such as a money-financed tax cut and an inflation target of 3%–4%. Yet, after U.S. interest rates hit zero in 2008, the Fed under Chairman Bernanke took more cautious actions. This paper asks when and why Bernanke changed his mind about zero-bound policy. The answer, at one level, is that he was influenced by analysis from the Fed staff that was presented at the Federal Open Market Committee (FOMC) meeting of June 2003. This answer raises another question: why did the staff's views influence Bernanke so strongly? I seek answers to this question in the social psychology literature on group decision-making. (*JEL* E52, E58)

[Japan's] economy has operated below potential for nearly a decade. Nor is it by any means clear that recovery is imminent. Policy options exist that could greatly reduce these losses. Why isn't more happening? To this outsider, at least, Japanese monetary policy seems paralyzed, with a paralysis that is largely self-induced.

Ben Bernanke (2000)

Monetary policy can be a powerful tool, but it is not a panacea for the problems currently faced by the U.S. economy.

Ben Bernanke (2011)

I. INTRODUCTION

What forces shape the policy decisions of a central bank? To gain insight into this question, this paper examines the policies of the Federal Reserve from 2009 through 2011. Unemployment was high during this period and Fed officials expressed a desire to reduce it by stimulating aggregate demand. Yet their traditional tool for demand stimulus—cuts in the federal funds rate—was not available, because this rate was close to its lower bound of zero. In this setting, the Fed confronted choices among various "unconventional" monetary policies.

The analysis starts with a puzzle about Ben Bernanke. From 2000 to 2003, when Bernanke was an economics professor and then a Fed Governor (but not yet Chair), he wrote and spoke extensively about monetary policy at the zero bound. He suggested policies for Japan, where interest rates were near zero at the time, and he discussed what the Fed should do if U.S. interest rates fell near zero and further stimulus were needed. In these early writings, Bernanke advocated a number of aggressive policies, including targets for long-term interest rates, depreciation of the currency, an inflation target of 3%–4%, and a money-financed fiscal expansion. Yet, after the United States hit the zero bound in December 2008, the Bernanke Fed eschewed the policies that Bernanke once supported and took more cautious actions—primarily, announcements about future federal funds rates and purchases of long-term Treasury securities (without targets for long-term interest rates).

A number of economists noted the difference between the policies of the Bernanke Fed and Bernanke's earlier views—usually critically. In discussing one of Bernanke's early writings on

*This paper is a revised and condensed version of NBER Working Paper #17836. I am grateful for suggestions from Patricia Bovers, Christopher Carroll, Jon Faust, Joseph Gagnon, Brad Humphreys, Donald Kohn, Daniel Leigh, Prakash Loungani, Gregory Mankiw, David Romer, Jonathan Wright, and an anonymous referee. The opinions in this paper are solely my own.

Ball: Professor, Department of Economics, Johns Hopkins University, Baltimore, MD 21212. Phone 410-516-7605, Fax 410-516-7600, E-mail lball@jhu.edu

ABBREVIATIONS

AEA: American Economic Association
BOJ: Bank of Japan
FOMC: Federal Open Market Committee
GDP: Gross Domestic Product
MOF: Ministry of Finance

Contemporary Economic Policy (ISSN 1465-7287)
Vol. 34, No. 1, January 2016, 7–20
Online Early publication March 18, 2015
doi:10.1111/coep.12103

the zero bound, Christina Romer said "My reaction to it was, 'I wish Ben would read this again'" (quoted in Klein 2011). Paul Krugman (2011b) asked "why Ben Bernanke 2011 isn't taking the advice of Ben Bernanke 2000." In criticizing Fed policy, Joseph Gagnon echoed Bernanke's criticism of the Bank of Japan (BOJ): "It's really ironic. It's a self-induced paralysis" (quoted in Miller 2011).

The leading explanation for Bernanke's caution as Fed chair was political pressure from inflation hawks. Krugman's (2011a) harsh assessment was

> *Mr. Bernanke is allowing himself to be bullied by the inflationistas … The Fed's policy is to do nothing about unemployment because Ron Paul is now the chairman of the House subcommittee on monetary policy.*

Mankiw (2011) viewed Bernanke more favorably, but he, too, cited the political constraints that Bernanke faced: "If Chairman Bernanke ever suggested increasing inflation to, say, 4 percent he would quickly return to being Professor Bernanke."

This paper examines Bernanke's changing views on monetary policy at the zero bound and seeks explanations for the changes. Section II documents Bernanke's early views, both the specific policies that he advocated and his broader view that the zero bound is not a significant impediment to demand stimulus. Section III discusses one change that occurred earlier than others, in 2002: Bernanke's rejection of exchange-rate depreciation as a stimulus tool.

Sections IV–VI review the broader evolution of Bernanke's views. I find that they changed abruptly in June 2003, while Bernanke was a Fed Governor. On June 24, the Federal Open Market Committee (FOMC) heard a briefing on policy at the zero bound prepared by the Board's Division of Monetary Affairs and presented by its director, Vincent Reinhart (FOMC 2003). The policy options that Reinhart emphasized are close to those that the Fed actually implemented after 2008; Reinhart either ignored or briefly dismissed the more aggressive policies that Bernanke had previously advocated. In the discussion that followed the briefing, Bernanke joined other FOMC members in agreeing with most of Reinhart's analysis. Shortly after the meeting, Bernanke began writing papers that took positions very close to Reinhart's—some with Reinhart as a coauthor. Clearly, the analysis of the Fed staff in 2003 was critical in changing Bernanke's views about the zero bound.

At first glance, Bernanke's sharp change in views is surprising. In 2003, he was a renowned macroeconomist who had studied the zero-bound problem extensively and expressed strong views about it. Yet he quickly accepted a different set of views when Reinhart presented them. Why did the positions of the Fed staff influence Bernanke so strongly?

This question is difficult to answer, as we can't observe Bernanke's thought processes. Yet we can develop hypotheses based on research by social psychologists, who study group decision-making. Based on this research, Section VII suggests two factors that may help explain Bernanke's behavior. The first possible factor is "groupthink" at the FOMC, a tendency of Committee members to accept a perceived majority view rather than raise alternatives that might be unpopular. The second is Ben Bernanke's personality, which is typically described as "quiet," "modest," and "shy"—traits that might make him unlikely to question others' views.

Section VIII considers other possible reasons that Bernanke's policies as Fed chair differed from those he advocated until 2003. One is his change in status from an academic economist to a policymaker. Another, which Bernanke himself has cited, is the absence of deflation in the United States. Both of these factors may be relevant, but I argue they are not central for explaining Bernanke's changing views about the zero bound.

Section IX concludes the paper. I draw lessons about the influence on monetary policy of the design of policy committees and the types of people selected for the committees.

To be clear, this paper is a positive analysis of why Ben Bernanke advocated and pursued different policies at different times. I take no position on what zero-bound policies are optimal in general or what Bernanke should have done as Fed chair.

II. BERNANKE'S EARLY VIEWS

Ben Bernanke's early views on the zero bound appear in three places. The first is a paper written while Bernanke was still a Princeton professor, called "Japan's Slump: A Case of Self-Induced Paralysis." Bernanke presented this paper at the American Economic Association (AEA) meetings in January 2000, and it was published as a chapter in Mikitani and Posen (2000). The other two discussions of the zero bound occurred while

Bernanke was a Fed Governor. One was a 2002 speech about U.S. monetary policy called "Deflation: Making Sure 'It' Doesn't Happen Here" (Bernanke 2002). The other was a speech in Tokyo in May 2003 called "Some Thoughts on Monetary Policy in Japan" (Bernanke 2003a).

In this section, I briefly review the developments in Japan and the United States that motivated Bernanke's comments; then document specific policies that Bernanke advocated on one or more occasions; and finally discuss Bernanke's overall theme, which is that the zero-bound problem is easy to overcome.

A. The Setting

In 1992, following the collapse of its asset-price bubble, Japan entered a long economic slump. Bernanke (2000) suggests that the gap between potential and actual output might have been 14% in 1999, and slow growth from 1999 through 2003 widened the gap. The output slump led to deflation: the consumer price index inflation rate turned negative in 1999 and reached about −1% in 2002. In response to these developments, the BOJ started lowering its policy rate in 1992 and continued until 1999, when the rate reached 0.1%, or effectively zero.

With interest rates near zero, many non-Japanese economists urged the BOJ to stimulate the economy through "unconventional" policies. Prominent examples include Krugman (1998) and Svensson (2001) as well as Bernanke. Japanese policymakers resisted most of the advice they received, but eventually implemented a modest "quantitative easing": they increased the monetary base by about 40% over 2002–2003.

In the United States, the recession of 2001 and the slow recovery pushed inflation near zero in 2003. In response, the Fed lowered the federal funds rate to 1.0%. Economists speculated that a further weakening of the economy could cause interest rates to hit the zero bound. As it turned out, economic growth increased, the Fed starting raising rates in 2004, and worries about the zero bound diminished until the crisis of 2008.

B. Specific Policy Proposals

In his early writings, Bernanke suggests a variety of unconventional monetary policies. Two of his ideas are similar to policies eventually adopted by the Fed after 2008: announcements about future short-term interest rates, and large open-market purchases of government securities. However, Bernanke puts greater emphasis on four other policies:

Depreciation. Bernanke advocates this policy in his paper on Japan's "Paralysis." "I believe," he writes, "that a policy of aggressive depreciation of the yen would by itself probably suffice to get the Japanese economy moving again." He elaborates:

> *I agree with the recommendations of Meltzer (1999) and McCallum (1999) that the BOJ should attempt to achieve substantial depreciation of the yen, ideally through large open-market sales of yen. Through its effects on import-price inflation (which has been sharply negative in recent years), on the demand for Japanese goods, and on expectations, a significant yen depreciation would go a long way toward jump-starting the reflationary process in Japan.*

Targets for Long-Term Interest Rates. Bernanke emphasizes this policy in his 2002 speech on the United States. If short-term interest rates are zero, he suggests, the Fed can "try to stimulate spending by lowering rates further out along the Treasury term structure—that is, rates on government bonds of longer maturities." He notes that the Fed can influence long-term rates through announcements about short rates, but says that this approach is not the best. Instead:

> *A more direct method, which I personally prefer, would be for the Fed to begin announcing explicit ceilings for yields on longer-term Treasury debt (say, bonds maturing within the next two years). The Fed could enforce these interest-rate ceilings by committing to make unlimited purchases of securities up to two years from maturity at prices consistent with the targeted yields … Of course, if operating in relatively short-dated Treasury debt proved insufficient, the Fed could also attempt to cap yields of Treasury securities at still longer maturities, say three to six years.*

As evidence that the Fed can control long rates, Bernanke cites the period before the Fed-Treasury Accord of 1951, when the Fed maintained a ceiling of 2.5% on long-term Treasury yields. He asserts that ceilings on long rates are a powerful policy tool: "I suspect that operating on rates on longer-term Treasuries would provide sufficient leverage for the Fed to achieve its goals in most plausible scenarios."

Money-Financed Tax Cuts. Bernanke discusses this policy—a "helicopter drop" of money—in all three of his early pieces. In his 2003 speech in Tokyo, he advocates "a tax cut for households and businesses that is explicitly coupled with incremental BOJ purchases of government debt—so that the tax cut is in effect financed by money creation." He argues that this policy would stimulate spending more than a bond-financed tax cut, which implies higher future taxes. Bernanke notes that his proposal would require "explicit but temporary cooperation between the monetary and fiscal authorities."

Higher Inflation. Finally, in the "Paralysis" paper, Bernanke writes

> *Krugman (1999) and others have suggested that the BOJ quantify its objectives by announcing an inflation target, and further that it be a fairly high target. I agree that this approach would be helpful. In particular, a target in the 3–4% range for inflation, to be maintained for a number of years, would confirm not only that the BOJ is intent on moving safely away from a deflationary regime, but also that it intends to make up some of the "price-level gap" created by eight years of zero or negative inflation.*

In his 2003 Tokyo speech, Bernanke varies his proposal: rather than an explicit, high inflation target, he advocates a target for the price level, "which would imply a period of reflation to offset the effects on prices of the recent period of deflation." Bernanke cites Eggertsson and Woodford (2003), which had just been issued as a working paper, as showing that a price-level target is better than an inflation target for overcoming the zero-bound problem. I do not view Bernanke's position in the Tokyo speech as a major change in views, because the policies he advocates there and in the "Paralysis" paper have the same key feature: inflation overshoots its long-run level for a period of time.

C. Tone

In addition to specific policy recommendations, Bernanke's early writings are noteworthy for a broad theme: even if short-term interest rates are zero, it is easy for a central bank to end an economic slump and prevent deflation. Policymakers have an abundance of tools to stimulate the economy, including the four listed above. On two occasions, Bernanke suggests that a single policy—depreciation (in the "Paralysis" paper) or targets for long-term interest rates (in "Preventing It")—is powerful enough to make the other tools unnecessary.

In the "Preventing It" speech, Bernanke assures the American public that they have little to fear from the zero bound. At the time of the speech, inflation and interest rates were both approaching zero. Yet Bernanke says "the chance of significant deflation in the United States in the foreseeable future is extremely small." "I am confident," he says, "that the Federal Reserve would take whatever means necessary to prevent significant deflation" and that "U.S. policymakers have the tools they need to prevent, and if necessary cure, a deflationary recession."

If it is easy to cure a deflationary recession, then there is something wrong with a central bank that fails to do so. Thus, starting with the title, Bernanke's paper about "Self-Induced Paralysis" is highly critical of the BOJ. In introducing his policy proposals, Bernanke says

> *Most of my arguments will not be new to the policy board and staff of the BOJ, which of course has discussed these questions extensively. However, their responses, when not confused or inconsistent, have generally relied on various technical or legal objections—objections which, I will argue, could be overcome if the will to do so existed.*

Bernanke continues to disparage the BOJ throughout his paper. He says, for example, that "far from being powerless, the Bank of Japan could achieve a great deal if it were willing to abandon its excessive caution and defensive response to criticism." In discussing exchange-rate policy, Bernanke says "BOJ stonewalling has been particularly pronounced on this issue, for reasons that are difficult to understand." His concluding section includes the passage about paralysis that is quoted at the start of this paper.

Bernanke's 2003 speech in Tokyo, while advocating major policy changes, is less critical of the BOJ than the "Paralysis" paper. Bernanke says the BOJ's responses to the zero-bound problem have been "slow and deliberate," but he also mentions "some willingness to experiment." He criticizes the recently retired Governor, Masaru Hayami, but only indirectly, by expressing hope that the new leaders of the BOJ "will be open to fresh ideas and approaches." Perhaps Bernanke adopts a friendly tone because he believes it will increase his chances of influencing the new policymakers. He may also temper his criticism of the BOJ because he has changed from an academic to a foreign policymaker, and because he is speaking to a Japanese rather than American audience.

III. AN EARLY SHIFT ON EXCHANGE RATES

As documented below, Ben Bernanke's major shift in views about the zero bound occurred over 2003–2004. However, his views about one specific policy—exchange-rate depreciation—changed earlier. Bernanke's "Paralysis" paper in 2000 advocates "aggressive depreciation of the yen," but his 2002 speech on preventing deflation rejects depreciation as a policy tool for the Fed. Bernanke notes that the Fed could influence the exchange rate by purchasing foreign assets. But then he says:

> *In the United States, the Department of the Treasury, not the Federal Reserve, is the lead agency for making international economic policy, including policy toward the dollar; and the Secretary of the Treasury has expressed the view that the determination of the value of the U.S. dollar should be left to free market forces. Moreover, since the United States is a large, relatively closed economy, manipulating the exchange value of the dollar would not be a particularly desirable way to fight domestic deflation, particularly given the range of other options available. Thus, I want to be absolutely clear that I am today neither forecasting nor recommending any attempt by U.S. policymakers to target the international value of the dollar.*

Notice that Bernanke rejects depreciation in part because of the "range of other options" for policy. He maintains the broad view, first expressed in his 2000 paper, that the problems posed by the zero bound are easy to overcome. The 2000 and 2002 pieces differ only in the particular policy tools that Bernanke emphasizes. In 2002, these tools include long-term interest rate targets and money-financed tax cuts, but not depreciation.

Yet Bernanke's shift on exchange-rate policy is stark. His argument that depreciation is unadvisable in the "relatively closed economy" of the United States is at odds with his previous advocacy of depreciation in Japan, an economy with a similar level of openness (as measured by imports or exports as a share of GDP). Most strikingly, Bernanke's argument that the central bank is not responsible for exchange rates is a point he rejects in his 2000 paper. There, in describing the BOJ's "stonewalling" on exchange-rate policy, Bernanke writes

> *The BOJ has argued that it does not have the legal authority to set yen policy … [I]t is true that technically the Ministry of Finance (MOF) retains responsibility for exchange-rate policy. (The same is true for the U.S., by the way, with the Treasury playing the role of MOF. I am not aware that this has been an important constraint on Fed policy.) The obvious solution is for BOJ and MOF to agree that yen depreciation is needed, abstaining from their ongoing turf wars long enough to take action in Japan's vital interest.*

Notice the suggestion that deference to the fiscal authority is an equally weak excuse for inaction on exchange rates by the BOJ and by the Fed. Bernanke continues:

> *Alternatively, the BOJ could probably undertake yen depreciation unilaterally; as the BOJ has a legal mandate to pursue price stability, it certainly could make a good argument that, with interest rates at zero, depreciation of the yen is the best available tool for achieving its legally mandated objective.*

Here, the argument for depreciation is, if anything, *stronger* for the United States than for Japan, because of the Fed's dual mandate. At the zero bound, depreciation could be justified as a tool for reducing unemployment as well as achieving price stability.

Why does Bernanke (2002) disagree with Bernanke (2000) on exchange rates? The natural answer is his appointment as a Fed Governor, which occurred in between the two pieces. Fed policymakers have long deferred to the Treasury on exchange-rate policy, believing that conflicting signals from U.S. officials could destabilize financial markets. In his 2002 Humphrey-Hawkins testimony, Alan Greenspan reminded Congress: "As you know, the Secretary of the Treasury speaks for our government on exchange-rate policy" (Greenspan 2002). In 2000, Professor Bernanke was "not aware" that the Fed's influence on exchange rates was constrained by its relationship with the Treasury. Evidently, he became aware once he was a Fed Governor and chose not to oppose the status quo. Again, one reason is that he saw other ways to solve the zero-bound problem.

IV. THE FOMC MEETING OF JUNE 2003

In his Tokyo speech in May 2003, Bernanke was still urging aggressive policies at the zero bound. By July 2003, as we will see, he was ignoring most of his previous ideas and proposing more cautious policies. What explains this sudden change? The obvious answer, at one level, is that Bernanke was influenced by the FOMC meeting of June 24.

At the time of this meeting, Japan had been stuck at the zero bound for 4 years, and the United States was experiencing its deflation scare. In that setting, the meeting began with a briefing by Vincent Reinhart, Director of the Board's Division of Monetary Affairs, called "Conducting Monetary Policy at Very Low Short-Term Interest Rates."

Reinhart outlined possible policies to "provide impetus to the economy" if the federal funds rate reached zero. A week earlier, FOMC members had received outlines of Reinhart's briefing in bullet-point form.

Here I summarize the briefing and the Committee discussion that followed. These summaries are based on transcripts of the meeting, which, per usual policy, were released 5 years later. We will see that Reinhart emphasized cautious approaches to the zero-bound problem, and that FOMC members did not question his caution. When Bernanke spoke, he largely echoed Reinhart's recommendations, even though they differed greatly from policies he had previously advocated.

A. The Briefing

Reinhart discussed three main policy tools at the zero bound. In the written material accompanying his talk, he summarizes these tools as

- Encouraging investors to expect short rates to be lower in the future than they currently anticipate.
- Shifting relative supplies to affect risk premiums.
- Oversupplying reserves at the zero funds rate.

Notice that these policies are close to those the Fed actually followed starting in 2009. The first point foreshadows the Fed's "forward guidance" about the federal funds rate; the second is Operation Twist, which the Fed implemented in 2011 (Reinhart is referring to the relative supplies of short-and long-term Treasuries); and the third is quantitative easing.

In the course of analyzing the option of "shifting relative supplies," Reinhart brings up one of Bernanke's early proposals: ceilings on long-term interest rates. He expresses skepticism that this "extreme" policy would work, saying in part:

> *[P]urchases of securities might have to be massive to enforce a ceiling if investors came to doubt that rates would be kept low. At that point, you might have the concern that the security would become disconnected from the yield curve and from private rates.*

Reinhart's discussion of his three main options covers four pages in the FOMC transcript. It is followed by half a page in which Reinhart notes, "There are other alternatives if the policymakers believed that deflationary forces were severe." He presents a list of policies that include two that Bernanke previously advocated: currency depreciation and money-financed tax cuts. The list also includes increased discount-window lending, purchases of corporate debt and equity, and reductions in reserve requirements. Lumping all these options together, Reinhart dismisses them:

> *You can see why I put this list last. These options would change how we are viewed in financial markets, involve credit judgments of a form we are not used to, perhaps smack of desperation, and pull us into a tighter relationship with other parts of government.*

B. Committee Discussion

In the FOMC transcript, the Reinhart briefing is followed by a wide-ranging discussion among Committee members and senior staff. The discussion covers 42 pages in the transcript. For our purposes, the following are highlights:

- A number of Committee members comment on Reinhart's proposals for quantitative easing and for management of expectations. In general, opinions of these proposals are moderately positive. Several people see quantitative easing as a natural next step for policy if the federal funds rate reaches zero, although others question the size of the effects.
- Many Committee members discuss ceilings on long-term interest rates, and they all oppose the idea. For example, Chairman Greenspan says that adopting such a policy "would be courting remarkable uncertainties" and would probably be ineffective. Governor Gramlich says

> *It strikes me that targeting the rate structure is a losing game. Six or seven people have spoken against that already. If we want to focus our staff's effort, I would propose that they spend less time on that.*

- There is almost no mention of policies besides Reinhart's three preferred options and the unpopular one of long-term rate ceilings. Aside from Bernanke's comments (discussed below), the discussion of additional options consists of, literally, a single sentence from San Francisco Fed President Parry. He says he would like to see more study of discount lending as a policy tool at the zero bound.

C. Bernanke's Comments

Bernanke was the 12th member of the FOMC to speak at the June 2003 meeting, out of 18 overall. His comments cover two pages of the

42-page discussion. Bernanke begins his remarks by outlining the policy options as he sees them:

> *I find it useful in thinking about monetary policy at the zero bound to view it as working in three broad ways. First, it works by affecting expectations of future short-term interest rates, which affect longer-term interest rates and other asset prices. Second, it works through mechanisms that depend on the imperfect substitutability of different assets. That would be, for example, the purchases of individual assets or the asset portfolio substitution effects that were described by Vincent. Third, it works through fiscal effects, which were not much emphasized in the materials we've looked at and are a form of last resort action, but which I think in the Japanese case might be called for at this point.*

The first two of Bernanke's suggestions are policies emphasized in Reinhart's briefing. The third, "fiscal effects," presumably refers to money-financed tax cuts, one of the policies that Bernanke had advocated in the past.

Bernanke compares the three policies on his list and concludes "I think we should be concentrating more on the expectational and commitment effects looking forward." He advocates this policy because its effects "are best understood." In contrast, the effects of asset purchases "are probably weak and difficult to identify at this point." Bernanke reiterates that the "fiscal effects probably fall into the last resort category," though he does not give a reason for this judgment.

Like many of his colleagues, Bernanke opposes targets for long-term interest rates:

> *To those of you who have argued against trying to "target" long-term interest rates—if by that you mean that we specify a target for the five-year bond and then try to enforce it by buying five-year bonds—I must say to you that I agree 100 percent that that's not going to work.*

At this point, Bernanke is far along in his evolution from Bernanke 2000 to Bernanke 2009–2011. The main policy he supports, commitments about future interest rates, is a Reinhart proposal that he did not emphasize in the past. Of Bernanke's four old proposals, he rejects one "100 percent" (targets for long-term rates), mentions one as a "last resort" (money-financed tax cuts), and ignores the other two (depreciation and a higher inflation target).

V. AFTER THE FOMC MEETING

The shift in Bernanke's views, which was far along in June 2003, was completed shortly thereafter. In a speech in July 2003, Bernanke presented ideas about zero-bound policy that are clearly influenced by Reinhart's FOMC briefing. Then, in 2004, Bernanke coauthored two papers with Reinhart that follow Reinhart's reasoning very closely.

A. The Speech of July 2003

This speech was presented at the University of California, San Diego (Bernanke 2003b). Titled "An Unwelcome Fall in Inflation?," it discusses the risk that ongoing economic slack could lead to deflation, and how policy might respond. Bernanke says:

> *Should the funds rate approach zero, the question will arise again about so-called non-traditional monetary-policy measures. I first discussed some of these measures in a speech last November (Bernanke 2002). Thanks in part to a great deal of fine work by the staff, my understanding of these measures and my confidence in their success has been greatly enhanced since I gave that speech.*

In this passage, Bernanke acknowledges that his views have been shaped by Fed staff work, presumably the Reinhart briefing. Perhaps it is also significant that Bernanke cites his 2002 speech on deflation as his first discussion of the zero bound. He ignores the "Paralysis" paper of 2000, where he harshly criticized the BOJ.

After the passage quoted above, Bernanke describes his current views on zero-bound policy:

> *I see the first stages of a "non-traditional" campaign as focusing on lowering longer-term interest rates. The two principal components of that campaign would be a commitment by the FOMC to keep short-term yields at a very low level for an extended period … together with a set of concrete measures to give weight to that commitment. Such measures might include, among others, increased purchases of longer-term government bonds by the Fed, an announced program of oversupplying bank reserves, term lending through the discount window at very low rates, and the issuance of options to borrow from the Fed at very low rates.*

Here, Bernanke lists all three of the policies that Reinhart emphasized in his briefing. Notice that he borrows a piece of idiosyncratic terminology from Reinhart: he describes quantitative easing as "oversupplying bank reserves."

Bernanke deviates modestly from Reinhart by including expanded discount lending and options on discount loans among the most likely responses to the zero bound. In Reinhart's briefing, expanded discount lending is one of the policies that is mentioned cryptically and dismissed—like currency depreciation and money-financed tax cuts.

B. Bernanke and Reinhart Together

Bernanke's next discussion of the zero bound occurred at the AEA meetings in January 2004. He presented a paper with Reinhart as coauthor and with the same title as Reinhart's FOMC briefing ("Conducting Monetary Policy at Very Low Short-Term Interest Rates"). This paper is essentially a revised draft of Reinhart's briefing. At this point, Bernanke has adopted Reinhart's views as his own.

The introduction to the Bernanke-Reinhart paper lays out Reinhart's three policy options with only modest changes in wording. The options are

> *(1) providing assurance to financial investors that short rates will be lower in the future than they currently expect, (2) changing the relative supplies of securities (such as Treasury notes and bonds) in the marketplace by shifting the composition of the central bank's balance sheet, and (3) increasing the size of the central bank's balance sheet beyond the level needed to set the short-term policy rate at zero ("quantitative easing").*

The paper also follows Reinhart in rejecting targets for long-term interest rates. It entirely ignores the options that the Reinhart briefing "puts last," including currency depreciation, money-financed tax cuts, and increased discount lending.

Along with broad conclusions, the Bernanke-Reinhart paper takes many details from the Reinhart briefing. One example is the argument that targets for long-term Treasury rates could cause these rates to become "disconnected from private rates." Another is the discussion of alternative commitment policies, which stresses the distinction between "unconditional" commitments to policies for a certain time period and "conditional" commitments tied to future economic events.

Later in 2004, Bernanke and Reinhart published an article in the *Brookings Papers* with a third author, Brian Sack of the Fed staff. This paper seeks to quantify the effects of Reinhart's three policies based on historical experiences, such as Japan's quantitative easing and periods when the supplies of short- and long-term Treasuries shifted for various reasons. In the paper's conclusion, the authors are equivocal about the policies they consider:

> *Despite our evidence that alternative policy measures have some effect, we remain cautious about relying on such approaches.... The effects of such policies remain quantitatively quite uncertain.*

Based on the questionable efficacy of nonstandard policies, Bernanke and his coauthors argue that policymakers should act preemptively to avoid the zero bound. The tone differs greatly from Bernanke's early writings, which say that the zero-bound problem is easy to overcome.

VI. THE ZERO-BOUND PERIOD

In December 2008, the United States hit the zero bound. In the years that followed, the Fed's main policy responses were close to the three suggestions in Reinhart's 2003 briefing and the Bernanke-Reinhart papers from 2004:

- The Fed sought to lower long-term interest rates through announcements about short rates, which have been called "forward guidance." Starting in 2009, the FOMC said after each meeting that it expected "exceptionally low levels" for the federal funds rate "for an extended period." Starting in August 2011, the Committee announced specific lengths of time that it expected rates to stay near zero. Finally, in December 2012 it switched to "conditional commitments" in Bernanke and Reinhart's terminology, saying that near-zero rates would continue until unemployment and inflation reached certain levels.
- Starting in September 2011, the Fed changed the relative supplies of assets through Operation Twist, in which it bought long-term Treasuries and sold short-term Treasuries.
- The Fed oversupplied bank reserves through several rounds of quantitative easing, QE1 in Spring 2009, QE2 in Fall 2010, and QE3 beginning in September 2012. (These actions also changed the relative supplies of securities, because the bonds purchased during the QE's were long-term.)

In sum, starting in 2009, the Fed implemented the contingency plans for the zero bound that the Greenspan Fed developed in 2003.

Fed officials including Chairman Bernanke generally ignored more aggressive policy options. For example, in Congressional testimony in October 2011, Bernanke asserted that the Fed could take additional steps to stimulate the economy if necessary. When a Congressman asked "what other tools are you contemplating?," Bernanke replied:

> *Generally speaking, there's a variety of things under the heading of communication, giving information to the public about how long and under what conditions we would hold interest rates low. That's one way of providing more stimulus. Of course, we could continue to buy securities in the open market would be a second way. A third relatively small step would be to reduce the interest rate that we pay on the reserves that banks hold with the Federal Reserve. Those are the main directions that I could cite.*

Leaving aside the "relatively small step," the policies that Bernanke mentions were merely extensions of ongoing policies. The "main directions that I could cite" do not include any of Bernanke's early proposals for zero-bound policy. One can see why advocates of more aggressive policy wanted Bernanke to reread some of his papers.

In Bernanke's public statements from 2009 through 2011, I can find only two occasions when he commented on aggressive policies that he once advocated. In both cases, the policy was an inflation target of 3–4%. At a hearing in April 2010 (Bernanke 2010a), a Congressman asked about 4% inflation and Bernanke replied, "that's not a direction that we're interested in pursuing. We're going to keep our inflation objectives about where they are." He explained that a higher inflation target would damage the Fed's "hard-won credibility" as a producer of price stability.

Bernanke also discussed a higher inflation target at the Jackson Hole Conference in August 2010 (Bernanke 2010b). Some economists had recently suggested a 4% target, notably Olivier Blanchard (Blanchard et al., 2010). In response, after outlining the Fed's three main policies, Bernanke mentioned "a fourth strategy, proposed by several economists," which "would have the Committee increase its medium-term inflation goals above levels consistent with price stability." Bernanke said "I see no support for this option on the FOMC" and again cited the harm to the Fed's anti-inflation credibility.

VII. WHY DID BERNANKE ADOPT REINHART'S VIEWS?

It is clear that Ben Bernanke's views on zero-bound policy changed over time, with most of the changes occurring in 2003 and 2004. At one level, the cause of the changes is also clear: Bernanke was swayed by Vincent Reinhart's briefing in June 2003 and the FOMC discussion that followed.

But why did Reinhart's briefing have such dramatic effects? Of course, someone can change his mind as a result of new evidence or arguments; Bernanke could simply have found Reinhart persuasive. Yet it is questionable that this simple explanation is the whole story. In 2003 Bernanke was one of the world's most eminent monetary economists, and he had written extensively about zero-bound policy. Given his expertise and the strong views he had expressed, one might expect Bernanke to take a leading role in the FOMC discussion, to put forward his ideas, and not to change his mind quickly. Even if Reinhart's arguments were strong, it is puzzling that Bernanke accepted them immediately.

In addition, Bernanke apparently dropped some of his old positions without hearing arguments against them. Reinhart's briefing and the FOMC discussion emphasized the drawbacks of targeting long-term interest rates, one of Bernanke's early proposals. But Reinhart cryptically dismissed Bernanke's ideas about money-financed tax cuts and depreciation, and he completely ignored the idea of 3%–4% inflation—and no FOMC member brought up any of these proposals. On these issues, rather than agreeing with persuasive arguments, Bernanke accepted his colleagues' implicit position that his old ideas were off the table.

Why was Bernanke so unassertive? It is hard to answer this question because we cannot observe Bernanke's thought processes. Yet we can speculate about the causes of his behavior—and our speculation can be informed by social psychology, which studies group decision-making. Here I discuss two factors that may have influenced Bernanke. The first, groupthink, was arguably a common feature of the Fed in the Greenspan era. The second factor is specific to Ben Bernanke: his personality.

A. *Groupthink*

Janis (1971) introduced the concept of groupthink and today it is a standard topic in psychology textbooks (e.g., Myers 2010). Janis defines groupthink as "the mode of thinking that persons engage in when concurrence-seeking becomes so dominant in a cohesive group that it tends to override realistic appraisal of alternative courses of action." When groupthink occurs, individuals go along with what they perceive as the majority view or the view of a group leader. They censor opinions of their own that differ from the majority because they value group harmony and they want to avoid disapproval from others. Because of self-censoring, the group may fail to consider some promising courses of action.

Janis and others use groupthink to explain disastrous military decisions, such as the Bay of Pigs invasion and the escalation of the Viet Nam war. Other psychologists apply the concept to political decisions such as the Watergate coverup and to business decisions such as Ford Motor's introduction of the unpopular Edsel. Sibert (2006) suggests that groupthink may occur in monetary-policy committees, although she does not cite specific decisions.

We can interpret the June 2003 FOMC meeting as an example of groupthink. The recommendations in Reinhart's briefing were presented as the views of a unified Fed staff. In the FOMC discussion, nobody, including Chairman Greenspan, seriously questioned Reinhart's focus on his three preferred policy options. By the time Bernanke spoke, a consensus had emerged on a number of points, such as opposition to targets for long-term interest rates. Groupthink may have discouraged Bernanke from shaking up the discussion with his past ideas for zero-bound policy.

A reluctance to disagree with the consensus was common at the Greenspan Fed, according to some observers. Cassidy (1996) describes how Alan Blinder, Fed Vice Chair from 1994 to 1996, reacted to FOMC meetings:

> *The thing that surprised Blinder most was the way decisions were made at the Board. Most of the time, the governors were presented with only one option: the staff recommendation. "There was a real reluctance to advance alternative points of view," Blinder says.*

Is groupthink a correct interpretation of Bernanke's behavior? When social psychologists ask whether groupthink explains a certain decision, they closely examine the decision-making process. Researchers have identified factors that cause groupthink, based on both historical examples and laboratory experiments, and they tend to interpret an episode as groupthink if these factors are present. A number of commonly cited factors were present at the FOMC in 2003 (see my 2012 working paper for more detail on these points).

- *A directive leader*: Groupthink is encouraged if the group leader expresses his views early and often in discussions and expects others to fall in line. Fed watchers and past FOMC members agree that Alan Greenspan was such a leader, a view that is supported by Greenspan's dominant role in the June 2003 FOMC meeting.
- *A tradition of consensus*: A desire for consensus encourages group members to stay quiet when they doubt the majority view. Such a desire at the Greenspan Fed is reflected in FOMC votes, which were usually unanimous and never had more than two dissents. Committee members believed that dissents would signal unhealthy conflict and undermine confidence in the Fed.
- *A sense of common purpose*: When group members feel they are working toward common goals, they are less likely to question one another's views. FOMC members agree on their primary goals—full employment and price stability—because these goals are prescribed in the Fed's legal mandate.
- *Camaraderie*: This factor, also referred to as "amiability" or "clubbiness," involves the personal relationships among group members. Observers of the FOMC during the Greenspan era report such an atmosphere, which included warm welcomes for new members, effusive tributes to Greenspan when he retired, and frequent inside jokes and laughter.
- *Insularity*: Groupthink is more likely when a group does not exchange views with outsiders. At the FOMC, briefings are based on analyses by Fed staff and often ignore outside research. Transcripts of meetings are secret for 5 years, and members warn each other not to reveal too much about their discussions in public.

We can better appreciate the FOMC's tendency for groupthink by comparing it to its counterpart in the U.K., the Bank of England's Monetary Policy Committee. Sibert suggests that groupthink is *not* likely at the Bank of England. The reasons include the absence of a directive leader or a desire for consensus: 5–4 votes on policy decisions are common, and the Governor is sometimes on the losing side. Each committee member has a legal mandate to vote based on her individual views. The committee includes "external" members who are not part of the Bank's management (arguably, however, Reserve Bank Presidents have a similar role on the FOMC). Finally, the Bank of England has long encouraged outside scrutiny through post-meeting news conferences, a practice that started only in 2011 at the Fed.

B. Bernanke's Personality

Students of groupthink explain a person's behavior within a group with characteristics of the group. Someone's behavior also depends on his individual personality. Does Ben Bernanke's personality help explain his behavior as a policymaker?

To address this question, we must first examine Bernanke's personality. To that end, I have surveyed published comments about Bernanke by journalists and professional colleagues. These people typically describe Bernanke with a set of related terms including "modest," "unassuming," and "quiet." Perhaps the most common term is "shy." For example, when *Time* magazine named Bernanke its Man of the Year for 2009, it called him "shy" and "a nerd" and said he "doesn't have a commanding presence" (Grunwald 2009). In the *Time* article, Mervyn King, Governor of the Bank of England, calls Bernanke "modest and unassuming." In a 2009 interview, Mark Gertler, Bernanke's long-time coauthor, says Bernanke "is pretty shy and unassuming" (Public Broadcasting System [PBS] 2009). Journalist David Wessel says "Bernanke is by nature kind of shy and introverted" (quoted in Gross 2009).

We can gain perspective on Bernanke by comparing him to other economic policymakers. Adam Davidson of National Public Radio compares Bernanke to Henry Paulson, the Treasury secretary during the financial crisis of 2008: "It's easy to contrast the two men, Henry Paulson and Ben Bernanke, this kind of headstrong, tall, bold bulldog in Henry Paulson and the much softer, quieter, bookish Bernanke" (Public Broadcasting System [PBS] 2009). Another obvious comparison is Lawrence Summers, like Bernanke an academic star who has held top policy positions. Journalists describe Summers with words such as bold, outspoken, hard-charging, domineering, and arrogant—never shy or unassuming.

Common sense suggests that someone's personality influences his behavior in a group meeting. Presumably someone who is quiet and shy is less likely than a more aggressive person to play a large role in the meeting or to forcefully advocate unpopular positions. This idea is supported by experimental research by social psychologists, who categorize individuals as "shy" or "not shy" based on questionnaires and then examine their behavior in meetings (e.g., Bradshaw and Stasson 1998).

Ben Bernanke's personality could therefore help explain his acquiescence to the majority view during the FOMC's discussion of the zero bound. Perhaps someone with the same views but a different personality would have behaved differently. Imagine a hypothetical FOMC member who had recently advocated policies that Reinhart's briefing ignored, and who was a "bulldog" like Henry Paulson or "outspoken" like Lawrence Summers. Such a person might have spoken up earlier and more assertively in the meeting and questioned Reinhart's emphasis on cautious policies.

VIII. THE ROLE OF POLITICAL AND ECONOMIC FACTORS

Many factors influence monetary policy. In explaining Ben Bernanke's changing views about the zero bound, I have emphasized the influence of the Fed staff and psychological factors. Here I discuss two other possible influences on Bernanke. One is the change in his role from academic to policymaker as a Fed Governor and then Chair. The other, suggested by Bernanke himself, is the absence of deflation in the United States. Both of these factors have probably had some effect on policy, but I argue that their importance is secondary.

A. From Academic to Policymaker

Several readers of this paper suggest that Bernanke's shift in views reflected his appointment to senior policy positions. When Bernanke became a Fed Governor in 2002, the attention to his statements from the press and financial markets may have made him more cautious in advocating new policies. When he was Fed Chair, he may have been influenced by the strong criticism of the Fed during the financial crisis. Recall Krugman's accusation that Bernanke "is allowing himself to be bullied" by inflation hawks like Ron Paul, and Mankiw's prediction that Bernanke would soon be a professor again if he pursued more aggressive policies.

These interpretations, however, do not fit the timing of the changes in Bernanke's views. His views did not change greatly when he became a policymaker: his speeches as a Governor in 2002 and 2003 echoed his advocacy of aggressive zero-bound policies as an academic. Bernanke's cautious attitude did not appear until the June 2003 FOMC meeting.

As discussed earlier, Bernanke's appointment as Governor *does* coincide with a change in views on one particular policy, currency depreciation. In his first zero-bound speech as a Governor, Bernanke affirmed the Fed's traditional deference to the Treasury on exchange-rate policy, which he had dismissed as an academic. In that speech, however, Bernanke's rejection of depreciation led him to argue more strongly for other aggressive policies, such as targets for long-term interest rates.

Clearly Bernanke's change in views occurred long before he became Fed Chair. He had stopped advocating aggressive zero-bound policies by 2004, when the zero-bound problem was still hypothetical for the United States. At that time, nobody imagined a future with Bernanke as Chair, the Great Recession, and increased politicization of monetary policy. The policies that Chairman Bernanke implemented after 2008 were remarkably similar to those he supported in 2004, suggesting that post-2008 criticism did not influence him greatly.

B. The Absence of Deflation

The Japanese experience analyzed by the early Bernanke included both an output slump and deflation. As Fed Chair, Bernanke faced an economy in a deep slump but with positive inflation. The absence of deflation might help explain why Bernanke's policies for the United States do not match his proposals for Japan.

Bernanke himself has suggested this idea. At his news conference of June 22, 2011, a Japanese journalist noted Bernanke's past criticism of the BOJ and asked about its relevance to U.S. policy. Bernanke replied, "I'm a little bit more sympathetic to central bankers now than I was 10 years ago." But then he continues

> *I think it's very important to understand that in my comments—both in the published comment a decade ago as well as in my speech in 2002 about deflation—my main point was that a determined central bank can always do something about deflation.... So we acted on that advice here in the United States, in August, September of last year. We could infer from, say TIPS prices—inflation index bond prices—that investors saw something on the order of a one-third chance of outright deflation going forward. So there was a significant risk there. The securities purchases that we did were intended, in part, to end that risk of deflation. And I think it's widely agreed that we succeeded in ending that deflation risk. I think also that our policies were constructive on the employment side. This, I realize, is a bit more controversial. But we did take actions as needed, even though we were at the zero lower bound of interest rates, to address deflation. So that was the thrust of my remarks 10 years ago. And we've been consistent with that approach.*

Here, Bernanke suggests that preventing deflation is the primary purpose of unconventional monetary policy, and that the Fed's cautious policies have sufficed to achieve that goal. In the United States, the aggressive policies that Bernanke advocated for Japan were not necessary to prevent deflation.

It is likely that the absence of deflation was one influence on Fed policy under Bernanke. Some zero-bound policies are more attractive in a deflationary slump than a non-deflationary slump. For example, if a money-financed tax cut raises inflation, this effect is welcome if inflation is initially negative. During much of Bernanke's tenure, he and colleagues would *not* have welcomed a significant increase in inflation because inflation was near their desired level of 2%.

Once again, we can better understand Bernanke's behavior by closely examining his writings and the June 2003 FOMC meeting. This record suggests that the absence of deflation is *not* the primary reason that Bernanke post-2008 differs from Bernanke 2000. This view is supported by two points.

First, Bernanke's claim that preventing deflation was the "main point" of his early writings is not completely accurate. Deflation *was* the main point of his 2002 speech, but not of his paper on "Japan's Slump" (the "published comment" that he mentions). That paper, as the title suggests, emphasized the slump in Japan's real economy. It begins by arguing that Japan has a large output gap and that "there is much the Bank of Japan, in cooperation with other government agencies, could do to promote economic recovery in Japan." The concluding discussion of "paralysis," quoted at the start of this paper, also refers to the output slump. Neither the paper's introduction nor its conclusion mentions deflation.

It is not surprising that "Japan's Slump" does not emphasize deflation, because it was first presented in January 2000. At that point it was not yet clear that Japan had entered a sustained deflation: in the late 1990s, inflation was slightly negative as measured by the GDP deflator but slightly positive as measured by consumer prices. The paper includes a discussion of Japan's "slow or even negative rate of price increases," but it appears in a section called "Diagnosis: Demand Deficiency." As this title suggests, Bernanke cites inflation behavior as evidence that Japan's slump was caused by a fall in aggregate demand, which monetary policy could reverse, rather than "structural problems." Bernanke does not say that deflation is harmful per se.

In sum, Bernanke's 2000 paper argues that an economic slump at the zero bound can and should be overcome through aggressive actions by the central bank. Bernanke's reasoning does not depend on the presence of deflation. Therefore, a policymaker with Bernanke's 2000 views would have responded more aggressively to the U.S. Great Recession than Chairman Bernanke did.

The second reason that inflation behavior does not appear central to explaining Fed policy involves the timing of Bernanke's shift in views. As emphasized throughout this paper, most of this shift occurred at the June 2003 FOMC meeting and shortly thereafter. At the meeting, Vincent Reinhart and Committee members discussed ways to stimulate demand if the U.S. hit the zero bound. They addressed this problem—a hypothetical one at the time—without saying explicitly whether the purpose of demand stimulus was to boost output, prevent deflation, or both. However, we can infer the likely mind-set of meeting participants from a briefing that occurred later in the meeting: a review of the state of the economy by David Wilcox of the Division of Research and Statistics. This briefing included estimates from the Fed's forecasting model of the probability that the U.S. would hit the zero bound (defined as a federal funds rate below 0.25 points) and the probability of deflation (defined as core personal consumption expenditure inflation below 0.5 points). According to these estimates, deflation was more likely than hitting the zero bound. Specifically, for 2004, there was a 19% chance of deflation without hitting the zero bound, an 18% chance of both deflation and the zero bound, and only a 4% chance of hitting the zero bound without deflation.

It therefore seems fair to assume that, when participants in the 2003 FOMC meeting discussed zero-bound policy, they had in mind a scenario that included deflation as well as an output slump. Starting at the 2003 meeting, Bernanke apparently supported Reinhart's cautious policies as a response to deflation. If this interpretation is correct, then Chairman Bernanke would have pursued cautious policies even if the Great Recession were accompanied by deflation—he still would have rejected his early proposals for Japan. The absence of deflation is not the primary explanation for Bernanke's caution.

IX. CONCLUSION

There is no doubt that Ben Bernanke's views on zero-bound policy changed over time. Once, he called targets for long-term interest rates a "policy I personally prefer"; later, he "agreed 100%" with opposition to that policy. Bernanke once advocated a 3%–4% inflation target for Japan; as Fed chair, he said "that's not a direction that we're interested in pursuing." Bernanke also abandoned his early proposals for currency depreciation and for money-financed tax cuts. More generally, as Fed Chair he no longer argued that a central bank can easily overcome the zero-bound problem "if the will to do so exists."

At one level, the primary reason for these changes is also clear: Bernanke was influenced by the work of the Fed staff, as summarized in Vincent Reinhart's June 2003 briefing to the FOMC. By 2004, Bernanke was coauthoring papers with Reinhart that advocated the same zero-bound policies as the briefing. These policies were communication about the federal funds rate, quantitative easing, and shifts in the Fed's holdings of short-and long-term securities—exactly the policies that the Bernanke Fed followed starting in 2009. In sum, Bernanke's views about the zero bound changed greatly between 2000 and 2004, but they were consistent after that.

The puzzle about this history is why Bernanke so quickly and completely dropped his previous views and adopted those of the Fed staff. We cannot be sure, but social psychology suggests two possible factors: groupthink and Bernanke's shy personality. These two factors are complementary. An atmosphere of groupthink pervaded the FOMC in 2003, discouraging anyone from questioning the views of the Fed staff. As a shy person, Bernanke may have been especially reluctant to suggest unpopular policies.

If this interpretation of history is correct, it has implications for the design of monetary-policy committees. A committee is likely to explore a greater range of options if the causes of groupthink are avoided, as Sibert suggests. Since the financial crisis, the Federal Reserve has taken some steps in that direction. The emphasis on consensus has diminished, as evidenced by an increase in dissents from FOMC votes—sometimes three dissents at one meeting. The FOMC has also reduced its insularity by publishing detailed statements about its unemployment and inflation goals, and through the Chair's post-meeting news conferences.

The history described here also has implications for the choice of people to serve on policy committees. It suggests that decisions are influenced not only by policymakers' expertise and opinions, but also by their personalities. Outspoken "bulldogs" may be more likely than shy people to contribute new ideas to policy debates. The appointment of such people to the FOMC might ensure that a wider range of policies are considered. On the other hand, appointing someone with a dominant personality as *Chair* of the Committee could have the opposite effect, as a dominant leader is one factor that contributes to groupthink.

REFERENCES

Bernanke, B. S. "Japanese Monetary Policy: A Case of Self-Induced Paralysis?," in *Japan's Financial Crisis and Its Parallels to U.S. Experience*, edited by A. Posen and R. Mikitani. Washington, DC: Institute for International Economics, 2000, 149–66.

———. "Deflation: Making Sure 'It' Doesn't Happen Here." 2002. Accessed March 10, 2015. http://www.federalreserve.gov/BOARDDOCS/SPEECHES/2002/20021121/default.htm.

———. "Some Thoughts on Monetary Policy in Japan." 2003a. Accessed March 10, 2015. http://www.federalreserve.gov/boarddocs/speeches/2003/20030531/default.htm.

———. "Remarks Before the Economics Roundtable, University of California, San Diego." 2003b. Accessed March 10, 2015. http://www.federalreserve.gov/boarddocs/speeches/2003/20030723/default.htm.

———. "Testimony Before the Joint Economic Committee of Congress." 2010a. Accessed March 10, 2015. http://www.federalreserve.gov/newsevents/testimony/bernanke20100414a.htm.

———. "The Economic Outlook and Monetary Policy." Jackson Hole Symposium, August 27, 2010b. Accessed March 10, 2015. http://www.federalreserve.gov/newsevents/speech/bernanke20100827a.htm.

———. "Testimony Before the Joint Economic Committee of Congress." October 4, 2011. Accessed March 10, 2015. http://www.federalreserve.gov/newsevents/testimony/bernanke20111004a.htm.

Bernanke, B. S., and V. R. Reinhart. "Conducting Monetary Policy at Very Low Short-Term Interest Rates." *American Economic Review*, 94, 2004, 85–90.

Bernanke, B. S., V. R. Reinhart, and B. P. Sack. "Monetary Policy Alternatives at the Zero Bound: An Empirical Assessment." *Brookings Papers on Economic Activity*, 2, 2004, 1–78.

Blanchard, O., G. Dell'Ariccia, and P. Mauro. "Rethinking Macroeconomic Policy," IMF Staff Position Note SPN/10/03, February 2010.

Bradshaw, S. D., and M. F. Stasson. "Attributions of Shy and Not-Shy Group Members for Collective Group Performance," *Small Group Research*, June 1998.

Cassidy, J. "Fleeing the Fed." *The New Yorker*, February 19, 1996.

Eggertsson, G., and M. Woodford. "The Zero Bound on Interest Rates and Optimal Monetary Policy." *Brookings Papers on Economic Activity*, 1, 2003, 139–211.

Federal Open Market Committee. "Transcript of FOMC Meeting." June 24–25 2003. Accessed March 10, 2015. http://www.federalreserve.gov/fomc/minutes/20030625.htm.

Greenspan, A. "Testimony Before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, July 16, 2002." 2002. Accessed March 10, 2015. http://www.federalreserve.gov/boarddocs/hh/2002/july/testimony.htm.

Gross, D. "In the Fed We Trust." *Newsweek*, August 10, 2009.

Grunwald, M. "Ben Bernanke." *Time*, December 16, 2009.

Janis, I. L. *Groupthink: Psychological Studies of Policy Decisions and Fiascoes*. Boston: Houghton Mifflin, 1971.

Klein, E. "Interview with Christina Romer." 2011. Accessed March 24, 2011. www.washingtonpost.com.

Krugman, P. "It's Baaack: Japan's Slump and the Return of the Liquidity Trap." *Brookings Papers on Economic Activity*, 2, 1998, 137–205.

Krugman, P. "Ron Paul and the Inflationistas Are Bullying Bernanke." *New York Times*, April 29, 2011a.

———. "Bernanke's Perry Problem." *New York Times*, August 25, 2011b.

Mankiw, N. G. "What's with All the Bernanke Bashing?" *New York Times*, July 30, 2011.

Mikitani, R., and A. Posen. *Japan's Financial Crisis and Its Parallels to U.S. Experience*. Washington, DC: Institute for International Economics, 2000.

Miller, R. "Professor Bernanke's Paralysis Warning Meets Fed Facing Same." *Bloomberg News*, June 20, 2011. Accessed March 10, 2015. http://www.bloomberg.com/news/articles/2011-06-20/professor-bernanke-warning-of-japan-paralysis-meets-fed-chief-facing-same.

Myers, D. *Social Psychology*. 10th ed. Chicago: McGraw-Hill Publishing Company, 2010.

Public Broadcasting System (PBS). "Inside the Meltdown." *Frontline*, February 17, 2009. Accessed March 10, 2015. http://www.pbs.org/wgbh/pages/frontline/meltdown/.

Sibert, A. "Central Banking by Committee." *International Finance*, 9, 2006, 145–68.

Svensson, L. E. O. "The Zero Bound in an Open Economy: A Foolproof Way of Escaping from a Liquidity Trap." *Monetary and Economic Studies, Special Edition*, February 2001, 277–312.