

## Introduction: The Real Problem Was Nominal

*“Tell me,” the great twentieth-century philosopher Ludwig Wittgenstein once asked a friend, “why do people always say it was natural for man to assume that the sun went around the Earth rather than that the Earth was rotating?” His friend replied, “Well, obviously because it just looks as though the Sun is going around the Earth.” Wittgenstein responded, “Well, what would it have looked like if it had looked as though the Earth was rotating?”<sup>1</sup>*

Most readers of this book have fairly vivid memories of the post-Lehman financial crisis, as well as the Great Recession of 2007. Liberals and conservatives may differ at the edges, such as which public policies they blame, but both sides share a common understanding of the basic trajectory of the crisis. The bursting of a major real estate bubble helped trigger first a banking crisis and then a deep recession. Monetary policy was extraordinarily expansionary during the downturn and recovery, but largely ineffective at boosting the economy.<sup>2</sup>

In this introductory chapter, I present a radically different interpretation of the Great Recession. At first it may seem implausible, even preposterous. Yet this radical view is based almost entirely on standard macroeconomic concepts, as they were understood back in 2007. It is the mainstream of the profession that abandoned this standard model, and that needs to justify its new view of macroeconomics.

Unfortunately, few non-economists are aware of the state of macro theory circa 2007, so you will have to initially suspend your disbelief in order to see if an alternative view of the past decade makes more sense than the standard view. This alternative is called “market monetarism,” and it developed out of the crisis of 2008.

All of the components of market monetarism are well-established economic principles, although the way they are utilized is novel in certain respects. The remainder of the book will lead you on an intellectual journey—how I came to my current views on monetary economics, which were well-established by 2007. These views have always been heavily informed by both data and theory—one without the other leads nowhere. Thus, we’ll toggle back and forth between the major empirical findings of monetary economics and the models used to make sense out of those relationships. Bit by bit we’ll see how I came to reach market monetarist views, and not some alternative approaches to macroeconomics such as older monetarist, Keynesian, Austrian or Classical schools of thought.

The second half of the book will return to the crisis of 2008, armed with a much better understanding of monetary economics. I’ll ask you a question similar to the

---

<sup>1</sup> Quote taken from *The God Delusion*, by Richard Dawkins, p. 411.

<sup>2</sup> Ben Bernanke’s *The Courage to Act: A Memoir of a Crisis and Its Aftermath* (2015) provides an excellent mainstream account of the financial crisis and the Great Recession.

Wittgenstein quotation above: What would the crisis of 2008 have looked like if the market monetarist view of reality were correct? As with the Solar System, the simplest and most coherent model of the Great Recession is highly counterintuitive, not at all what most of us thought we saw happening in 2008.

## **The Conventional View**

Here is how Stanford economist Robert Hall started off a survey article in the Fall 2010 *Journal of Economic Perspectives*: “The worst financial crisis in the history of the United States and many other countries started in 1929. The Great Depression followed. The second-worst struck in the fall of 2008 and the Great Recession followed.”

Although Hall is one of my favorite macroeconomists, I believe he’s wrong in this case. And wrong in a very revealing way. There was no significant financial crisis in the U.S. during 1929. The major financial crisis of the Great Depression occurred in 1931.<sup>3</sup> Now, why is this timeline so important? Because Hall’s description makes it seem like the financial crisis in 1929 triggered the Great Depression, whereas what actually occurred is that the Great Depression led to a severe financial crisis. Debts are harder to repay when national income is falling rapidly, as income provides the funds that people and businesses use to use to repay debts.

I would argue that something quite similar occurred in 2008. Admittedly, the 2008 case is more complicated than the Great Depression. Whereas the financial system was in good shape in 1929, financial stresses were developing well before the 2008 recession, due to problems with subprime loans. Even so, the specific financial crisis that Hall is referring to (“the fall of 2008”) is the severe post-Lehman crisis that began in late September 2008 and intensified in October.

Why is the timing so important? Because the Great Recession began in December 2007, and became severe after June 2008. Just as in the 1930s, a slump in the economy created severe financial distress. In the 2008 case, it transformed a modest banking crisis into a major crisis. Unfortunately, due to long lags in collecting GDP data, at the time no one understood that the country was already in the midst of a severe recession when Lehman failed in September. It looked like Lehman *caused* the severe recession, as the truly horrifying GDP data came out later in the year and in early 2009.<sup>4</sup>

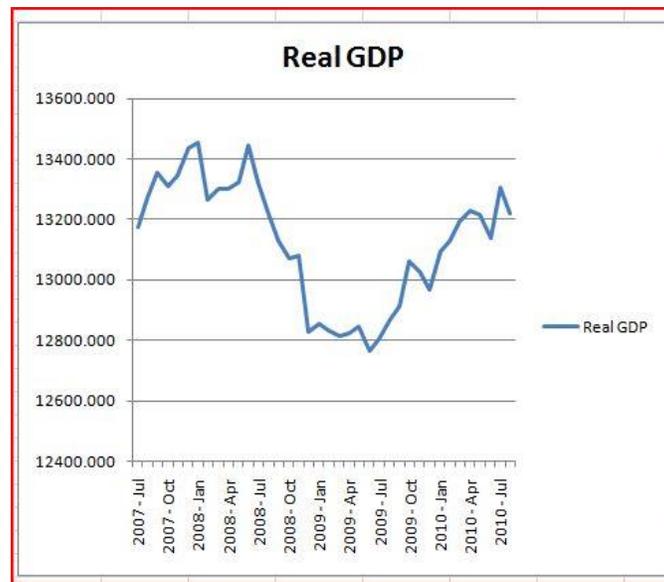
## **Real and Nominal GDP**

---

<sup>3</sup> See Friedman and Schwartz (1963).

<sup>4</sup> In addition, the GDP growth data from 2008 was revised downward in later revisions.

Macroeconomic Advisors estimate monthly GDP data derived from the various data series that the government uses to construct its quarterly GDP estimates. Here's what things looked like during the Great Recession:

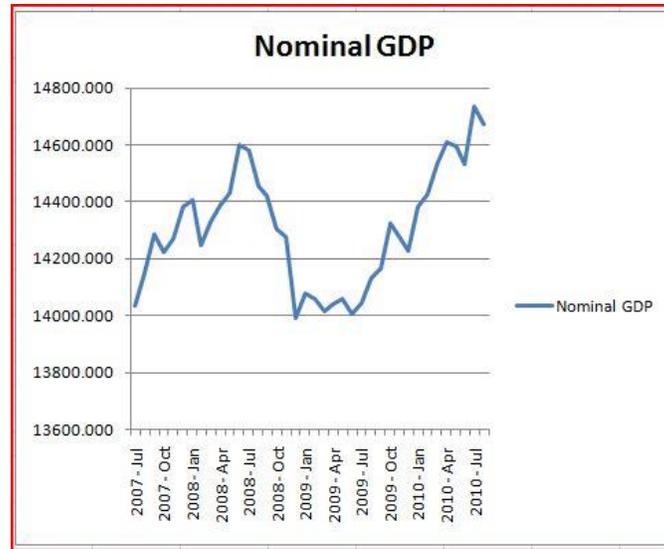


The sharp drop that you see occurs between June and December 2008. Keep that six-month period in the back of your mind, as we will continually be referring back to this crucial period of time. Due to quirks in the relationship between levels and rates of change, even a quarterly data series can be very misleading. Thus, real GDP looks pretty level in the first three months of 2009, but quarterly real GDP actually shows a sharp decline from the fourth quarter, even though the *level* of GDP in 2009:Q1 was not much different from December 2008. That's because GDP during October and November 2008 was far higher than during December.

The bottom dropped out of the economy in the second half of 2008, even though this wasn't understood until very late in the year. Lehman failed about halfway through this steep decline (in September 2008), triggering a major global banking crisis. By December most of the damage was done; the Great Recession had begun, and the effects would linger for years.

I'm going to argue that the housing bubble and financial crisis did not cause the Great Recession. Rather, the direct cause of the recession was a fall in nominal GDP (NGDP), and the cause of the decline in NGDP was an excessively contractionary monetary policy. In a sense the Fed was to blame, although it is probably more accurate to say the entire economic profession is at fault, as they were operating with a flawed model of monetary policy.

The Fed rarely strays very far from the consensus view of elite macroeconomists. So, let's take a look at NGDP during the same period of time:



Notice the same sort of steep decline in NGDP as in RGDP during the period of June to December 2008. At this point I usually get questions: “Isn’t this pretty much a tautology?” . . . “Real and nominal GDP are quite similar; obviously if one declines then the other will as well.” . . . “In what sense is a decline in NGDP a cause of a decline in RGDP?” . . . “The real question is what caused them both to decline.”

I sympathize with these questions, but they are based on a fundamental misunderstanding of the relationship between real and nominal variables. Although RGDP and NGDP may sound similar, they are radically different concepts, even at a basic ontological level. You might say nominal and real variables are as different as words and physical objects. Even many economists don’t see this, because we are forced to use numbers to measure both aggregates, and because RGDP includes many different types of objects and thus some sort of “index number” is required to make sense of the concept.

Nonetheless, real and nominal GDP are radically different. Nominal GDP is the total dollar value of all final goods and services produced domestically, in a given period of time. Real GDP is nominal GDP adjusted for change in the price level, to factor out the effects of inflation. If you had to picture NGDP, you might visualize a dollar bill; it’s a monetary concept. If you want to picture real GDP, you might imagine thousands of factories, shopping malls, office buildings and homes. And, of course millions of workers providing services. In 2008, Zimbabwe’s NGDP might be visualized as follows:



And it was soaring higher at an astronomical rate.

In contrast, Zimbabwe's RGDP is a physical concept; in 2008 it took the form of abandoned farms and shuttered factories, due to inept government policies that punished wealth creators. Real GDP plunged as they fell into depression, while NGDP soared higher at the fastest rate in the world.

In the U.S., RGDP and NGDP are more closely correlated. But even here NGDP growth rates soared to double-digit levels in the 1970s, even as RGDP growth ran at about 3%, lower than during the 1960s. They are very different concepts.

And yet, over shorter periods of time, NGDP and RGDP are indeed highly correlated in the U.S., but perhaps not for the reasons you assume. One of the basic goals of this book, and indeed in some respects the key to macroeconomics, is to understand why NGDP and RGDP are highly correlated in some cases and not at all in others. When we finally figure this out, we'll see that a policy that prevented NGDP from falling in 2008 would most likely have also prevented RGDP from falling, or at least greatly moderated the decline. A mild recession might have been inevitable, but the actual slump was far deeper than necessary.

## **What Is the "Stance" of Monetary Policy?**

Let's say that the decline in NGDP was the proximate cause of the decline in RGDP (later I'll explain exactly how and why these variables are related in the short run). That still leaves open the question of how I can claim that the Fed is to blame for the Great Recession. After all, "everyone knows" that monetary policy was extremely expansionary during 2008. The Fed cut interest rates sharply, to near-zero levels by the end of the year. They also pumped lots of money into the economy. As we will see, however, what "everyone knows" just isn't so.

This is not the first time that economists have confused low interest rates with easy money. The same mistake was made during the 1930s. Not until the famous

*Monetary History of the United States* by Milton Friedman and Anna Schwartz was published in the 1960s did economists come to realize that policy was actually quite contractionary, or “tight” during the 1930s, despite near-zero interest rates. Today even Ben Bernanke accepts Friedman and Schwartz’s claim that the Fed was to blame for the Great Depression.

Unfortunately, many economists continued to judge the stance of monetary policy by looking at interest rates. In December 1997, Friedman expressed dismay that many were forgetting the lessons of the *Monetary History*. Interest rates in Japan had fallen close to zero due to deflationary monetary policies, and yet many pundits wrongly assumed that Japan had an easy money policy, despite a falling price level. Friedman wrote in the *Wall Street Journal*:

*Low interest rates are generally a sign that money has been tight, as in Japan; high interest rates, that money has been easy. . . . After the U.S. experience during the Great Depression, and after inflation and rising interest rates in the 1970s and disinflation and falling interest rates in the 1980s, I thought the fallacy of identifying tight money with high interest rates and easy money with low interest rates was dead. Apparently, old fallacies never die.*

Here Friedman is referring to the tendency of interest rates to follow inflation. A tight money policy produces low inflation, which leads to low interest rates, and vice versa.<sup>5</sup>

Although Milton Friedman was perhaps the greatest monetary economist of the 20<sup>th</sup> century, he was also a monetarist with some unconventional views. Maybe he was wrong about the policy stance in Japan, perhaps they did have easy money. But Friedman isn’t alone. Consider these three key lessons for students, from the best-selling monetary textbook in 2008:

- 1. It is dangerous always to associate the easing or the tightening of monetary policy with a fall or a rise in short-term nominal interest rates.*
- 2. Other asset prices besides those on short-term debt instruments contain important information about the stance of monetary policy because they are important elements in various monetary policy transmission mechanisms.*
- 3. Monetary policy can be highly effective in reviving a weak economy even if short term rates are already near zero.*

This was written by Frederic Mishkin, a highly respected New Keynesian economist who served on the Federal Reserve Board with Ben Bernanke. At that time their policy views were quite close, according to Bernanke’s memoir. As an academic,

---

<sup>5</sup> Friedman looked at broader monetary aggregates such as “M2” when evaluating the stance of monetary policy. Unfortunately, the monetary aggregates have not proven to be reliable indicators in recent years.

Bernanke also believe that monetary policy has almost unlimited ability to stimulate the economy when interest rates are stuck at zero.<sup>6</sup>

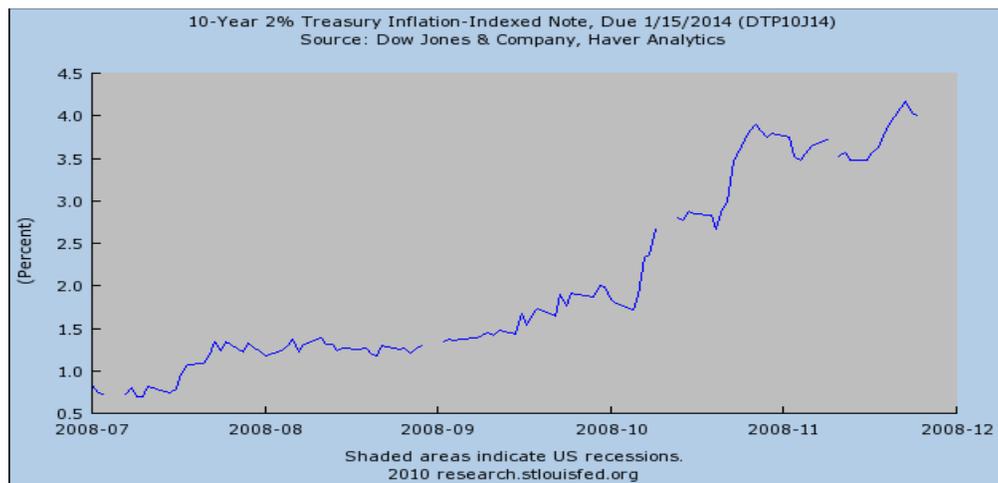
This is also the textbook that I had been using to teach for a quarter century before 2008. I believed these three ideas were extremely important, and always emphasized them in class. Consider my surprise, then, when I looked around in late 2008 and found that few of my fellow economists believed in these assertions. Most economists seemed to think that low interest rates did represent easy money. Most economists also seemed to believe that monetary policy is *not* highly effective when interest rates are close to zero.

This discovery led me to devote my career to trying to change the conventional wisdom back to the ideas in Mishkin's textbook. In this book, I will explain why I stuck with the textbook version of monetary economics in 2008---not the view that caught on with most pundits---that monetary policy became ineffective after rates hit zero in December 2008, if not earlier. As we will see, Mishkin was right in claiming that monetary policy remains highly effective at near zero interest rates.

## How Did Asset Markets Move in Late 2008?

Recall that Mishkin claimed that the stance of monetary policy should not be measured by the level of interest rates. Rather, one should look at the movements in other asset prices. So, let's do that, focusing on the key six-month period in late 2008.

When I point out to other economists that nominal interest rates are not a good indicator of the stance of monetary policy, they often accept my claim, but then point to the real interest rate. So let's look at the real interest on five-year Treasury bonds during the period from July to November 2008:



---

<sup>6</sup> Bernanke (1999). *Japanese Monetary Policy: A Case of Self-Induced Paralysis?*

That's a stunning increase in real interest rates, especially for such a short period of time. And yet most economists that I talk to are not even aware that real interest rates rose from less than 1% to over 4% during the teeth of the financial crisis. Why would the Fed allow this to happen?

In fact, those economists who point to the real interest rate are wrong—it's not a good indicator of the stance of monetary policy, for the same basic reason that nominal rates are unreliable. Just as nominal rates can be distorted by changes in expected inflation, the real interest rate can be distorted by changes in real output. Ironically, however, many of the economists who say we should look at the real interest rate seem unaware of the fact that this indicator suggests that monetary policy was *highly contractionary* in late 2008.

Another popular asset price is the exchange rate, which measures the value of the dollar in terms of foreign currencies. Once again, it's not always a reliable indicator of the stance of monetary policy, but to the extent it is useful, it was signaling extremely tight money in late 2008. Indeed, the foreign exchange value of the dollar soared by about 15% (in trade-weighted terms) in late 2008:



Interestingly, currencies almost always depreciate sharply during a severe financial crisis. Dozens of examples prove this, from Thailand to Mexico to Russia to Iceland. The rare examples when a currency appreciated during a financial crisis (the U.S. in 1931-32 and Argentina in 1998-2001) are cases that we now know involved excessively contractionary monetary policy.

Other asset markets showed the same pattern:

Stock prices crashed in late 2008.

Commodity prices fell by more than 50% in late 2008.

Commercial real estate prices started falling sharply about the same time as NGDP, long after the subprime bubble burst.

Residential real estate prices in the heartland (Texas, etc.) had been stable during the 2006-08 subprime crash, and started falling in late 2008 along with NGDP.

TIPS spreads (i.e., inflation expectations in the bond market) fell sharply.

So if we are to take seriously what we've been teaching our students for years, then it seems that all the "other asset markets" referred to by Mishkin were flashing warning signs that money was far too tight.

Of course, not everyone agrees with Mishkin's way of characterizing the stance of monetary policy. I prefer looking at NGDP growth, as does Ben Bernanke:

The imperfect reliability of money growth as an indicator of monetary policy is unfortunate, because we don't really have anything satisfactory to replace it. As emphasized by Friedman . . . nominal interest rates are not good indicators of the stance of policy. . . . The real short-term interest rate . . . is also imperfect. . . .

Ultimately, it appears, one can check to see if an economy has a stable monetary background only by looking at macroeconomic indicators such as **nominal GDP growth** and inflation.

If we average out NGDP growth and inflation, we find that monetary policy during 2008-13 was the tightest since Herbert Hoover was president. And recall that Bernanke once argue that Hoover's tight money policies caused the Great Depression. Although the stance of monetary policy was extremely contractionary by the criteria laid out by Bernanke in 2003, as Fed Chair he insisted that policy was quite *accommodative* during 2009-13.

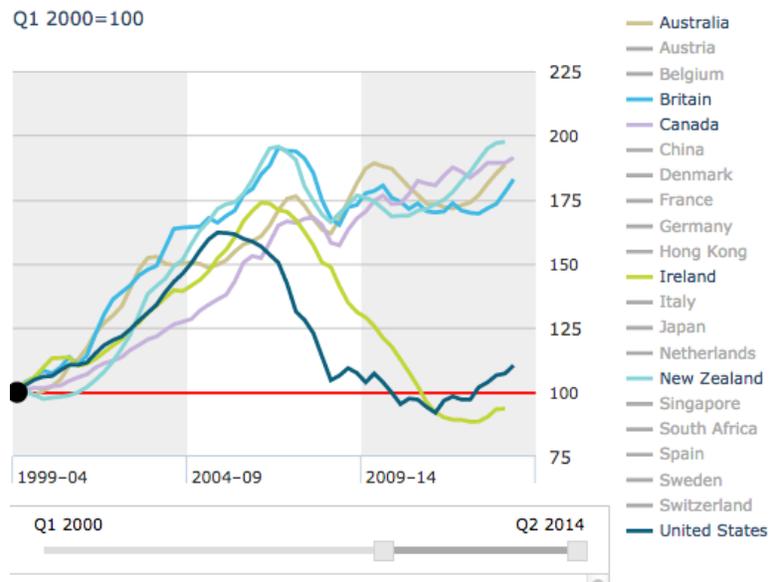
A well-functioning economy requires NGDP to rise at a fairly steady rate, but not too fast. The Fed has all the tools required to make this happen. When NGDP performs poorly, it represents a failure of monetary policy.

## **Didn't the Housing Bubble Cause the Great Recession?**

If macroeconomic theory, circa 2007, clearly points to tight money as the cause of the Great Recession, then why do so few economists believe that? One answer is that it didn't look like tight money was to blame. Even though most economists understand that low rates don't necessarily mean easy money, many don't incorporate the implications of this into their worldview. Instead, there's a

tendency to focus on the most visible manifestations of a tight money policy, such as falling asset prices and financial distress. Just as to early humans it looked like the Sun went around the Earth, to most economists it *looked like* the housing bust and the subsequent financial crisis caused the Great Recession.

Let's start with the housing "bubble." I use scare quotes, as later I'll show that bubbles may not exist, or at least are not a useful concept. The standard view is that American home prices soared to irrational heights during the 2005-06 housing bubble, and that a later sharp decline was almost inevitable. But was it? After all, housing prices soared in many other countries at about the same time. The following graph shows housing prices in six English-speaking countries:



Notice that house prices (in real terms) soared much higher in all six English-speaking markets, and yet prices later collapsed in only two of the markets: the U.S. and Ireland. In the other four economies house prices moved sideways in real terms (and rose even higher in nominal terms).

Back in 2006, it was difficult to predict which of these six markets would experience sharp house price declines. If you correctly predicted the housing bubble collapse in the U.S., you need to consider whether you were merely lucky to have resided in one of the two out of six countries where your prediction would have been accurate.

Even if the fall in U.S. house prices did not represent the bursting of a bubble, it obviously could have caused a recession. After all, there are lots of jobs in home construction and related industries. But did the housing slump actually cause a sharp rise in unemployment? The data suggests the answer is no.

Between January 2006 (when housing construction peaked) and April 2008, the U.S. experienced a more than 50% decline in homebuilding. By the latter date the vast

majority of the decline in homebuilding was over. And yet during that 27-month period the unemployment rate merely edged up from 4.7 to 5.0% (which was still considered to be roughly “full employment”):

Jan. 2006: starts = 2,303,000, completions = 2,058,000, average = 2,180,000,  
Unemployment rate = 4.7%

April 2008: starts = 1,008,000, completions = 1,014,000, average = 1,011,000,  
Unemployment rate = 5.0%

October 2009: starts = 527,000, completions = 745,000, average = 636,000.  
Unemployment rate = 10.0%

The earlier period shows exactly how economies are supposed to work, at least in (classical) theory. An economy has a “production possibilities curve,” which shows the maximum possible output in a variety of industries. If more resources are used to produce one type of good, then fewer resources will be available to produce other types of goods. The opportunity cost of more housing is less production of cars, computers, and restaurant meals.

The period between January 2006 and April 2008 provides a pretty good example of the classical model in action. As homebuilding slumped, workers shifted into other sectors such as manufacturing, commercial construction, exports and services. Because NGDP kept growing (due to sound monetary policy), the unemployment rate stayed fairly low.

The housing slump did impose some costs on the economy. Workers often find it difficult to switch from one sector to another, and that caused a small rise in the unemployment rate. But these “re-allocation” costs are utterly trivial compared to the costs that occur when money is too tight and NGDP falls. Between April 2008 and October 2009, when NGDP fell sharply, the unemployment rate soared from 5.0% to 10.0%. Now jobs were not just being lost in homebuilding, but also in manufacturing, commercial real estate construction, and even some service industries.

Another popular view holds that big financial crises always lead to big recessions and slow recoveries. It’s not at all surprising that the two are often *associated* with each other, as people, businesses and governments would be expected to have more trouble repaying debts when NGDP falls sharply. But that correlation in no way prevents the central bank from promoting a rapid recovery through monetary stimulus. The banking crisis of 1933 was perhaps the worst in American history, but both NGDP and RGDP rose rapidly after March 1933, despite the fact that much of the banking system was shut down at the time.

How did this 1933 growth miracle occur? According to Ben Bernanke, it was FDR’s decision to adopt a highly aggressive and unconventional form of monetary stimulus—in the form of dollar devaluation. In 1999, Bernanke wrote a paper entitled “Japanese Monetary Policy: A Case of Self-Induced Paralysis?” and answered

the question in the affirmative. He ended the paper by imploring the Bank of Japan to show “Rooseveltian resolve,” in the face of the zero interest rate problem, just as FDR had in 1933.<sup>7</sup> Unfortunately, when it became the Fed’s turn to show Rooseveltian resolve at the zero interest rate boundary, they fell short.

Another misconception is that the Fed “did all it could.” Some excuse the Fed by pointing to the political unpopularity of unconventional tools such as qualitative easing and negative interest on bank reserves. But the Fed did not reach the zero bound until mid-December 2008, by which time most of the great NGDP collapse was over. When the Fed met two days after Lehman failed in September 2008, they refused to take even the most basic conventional monetary policy step, such as cutting their target interest rate (which was 2.0% at the time). In his memoir, Ben Bernanke concedes that it was a mistake not to cut rates in September 2008. Later I’ll explain why this isn’t just “Monday morning quarterbacking”, and should have been obvious to policymakers at the time.

Even after interest rates finally were cut to 0.25% in December 2008, the Fed was far from doing all it could. It could have cut them further, to 0.0%, or -0.25%, or -0.5%, or -0.75%. It could have done far more QE. More importantly, it could have adopted an alternative policy target, such as the “price level targeting” that Ben Bernanke recommended the Japanese adopt, when faced with similar circumstances. Interestingly, Bernanke has recently resumed his advocacy of price level targeting now that he is no longer head of the Fed.

In fairness, I think Bernanke did better than most other economists would have in his place. He was not a dictator, but rather had to work with many other policymakers at the Fed, some of whom had much less enlightened views on monetary policy. The Fed did far better in 2008-09 than in 1929-33, and far better than the ECB. Yet despite the policy of low interest rates and quantitative easing, policy was still effectively tight, and this contributed greatly to an unnecessarily severe recession.

Ben Bernanke has already admitted that the Great Depression was the Fed’s fault. Bernanke has also asserted that the Great Inflation of 1966-81 was the Fed’s fault. Bernanke also suggested that the Fed deserves credit for producing what he called the “Great Moderation” of 1984-2007, a period when the economy performed pretty well. I agree with all three of these claims; all three “Great” events were linked to Fed policy. So why is it so far-fetched to believe the Great Recession was also the Fed’s fault?

## **Almost Everything You Heard about the Great Recession Is Wrong**

---

<sup>7</sup> In chapter 17, I’ll show that the 1999 Bernanke critique of the BOJ mirrors the criticisms of the Fed provided in this book.

In the following chapters I will take you on an intellectual journey that will involve unlearning many of the things that you “know” that just aren’t so. Here are just a few of the many myths regarding the Great Recession:

1. Housing was a bubble that inevitably had to burst.
2. The decline in homebuilding caused a big rise in unemployment.
3. Beginning in 2008, low interest rates represented easy money.
4. Monetary policy was no longer highly effective at zero interest rates.
5. NGDP and RGDP declined *despite* monetary stimulus from the Fed.
6. The Fed was unable to stop the decline in GDP during 2008, because interest rates had already fallen to zero. (They had not.)
7. The Fed cut interest rates as far as they could.
8. The financial crisis caused the Great Recession.
9. An economy cannot recover rapidly during and after a severe financial crisis.
10. After the debt crisis many Americans struggled to make ends meet, and therefore it made sense for aggregate demand to decline, for Americans to “tighten their belts.”

All these and many other misconceptions will be punctured in the following chapters.

## **Chapter 21: Policy Implications of Market Monetarism**

In the preceding analysis, I’ve pushed back against the notion that monetary policy is a series of “gestures,” which supplement other gestures being made by fiscal policymakers, as well as shocks from the private sector. I’ve argued that a better analogy is of a ship captain who steers a large vessel, which is constantly being affected by wind and waves. In this view, the captain (i.e. FOMC) is responsible for the course taken by the ship, and is expected to push back against outside factors.

If we frame things this way, then the “root cause” of destabilizing demand-side shocks is monetary policy instability. For instance, the root cause of the Great Contraction of 1929-33 is the failure of central banks to prevent a big fall in NGDP. Of course you can always look for even deeper root causes, such as the failure to appoint the right officials, or the failure of the interwar economics profession to correctly analyze what was going wrong. But the most *useful* definition of root causes focuses on the role of policy---if we can figure out how to get policy right, then we can prevent economic problems caused by NGDP instability.

If the market monetarist analysis is correct, then what are the implications for policy? People with some familiarity with our ideas often immediately think in terms of NGDP targeting. It’s true that the Fed allowed NGDP to fall sharply during

2008-09, and that this policy failure was the proximate cause of the Great Recession. But it's equally true that the Fed failed to achieve its dual mandate of 2% PCE inflation and high employment. So pointing to a lack of NGDP targeting is not enough---the policy failures went much deeper.

Market monetarists are sometimes associated with unconventional policy tools such as quantitative easing and negative IOR. Once again, however, this misses the bigger picture. It's nice to know how to clean up the mess after a large bridge collapses, but the real point is to *prevent the bridge collapse*. It's useful to have policy tools for a severely depressed economy, but the real point is to prevent events such as the Great Recession. You'd like a policy regime where those tools are not needed. If market monetarism has anything useful to offer, it would lead to a regime where there is much less use of extraordinary policy tools such as QE and negative IOR. The point is to keep NGDP growing strongly enough so that the public and banks don't choose to hoard enormous quantities of base money (cash and reserves).

## 1. What Remains to Be Done?

I am sympathetic to the "Whig view of monetary history," that is, the view that we are learning from previous mistakes and that policy is improving over time. After the Great Depression, the Federal Reserve was gradually given additional flexibility to prevent sharp declines in nominal spending. Unfortunately, it took many years for the Fed to adapt to the almost unlimited discretion available under a pure fiat money regime. The decision to allow gold prices to float after March 1968 was the monetary equivalent to giving a 16-year-old boy the keys to his dad's Maserati. There is a learning curve, in this case the Great Inflation.

By the 1980s, central bankers had absorbed the "Taylor principle", which says that the central bank needs to raise their interest rate target even faster than any increase in inflation.<sup>8</sup> This assures that even the real interest rate will rise when money is tightened, putting downward pressure on inflation. Once central banks had figured this out, high inflation was no longer a problem. In America, this success was attributed to the wizardry of Alan Greenspan, but in fact foreign central banks were equally successful. It's not difficult for a determined central bank to prevent high inflation.

More recently, central banks have struggled with the issue of how to deal with excessively low inflation. It is still unclear how much central bankers have learned from the mistakes made during Great Recession, but surely they have learned *something*. I'm actually pretty optimistic about the future.

One way of thinking about the optimal monetary policy is to look at what went wrong during the Great Recession, and how well the next iteration of policy rules

---

<sup>8</sup> The Taylor Principle was developed by John Taylor, and the related "Taylor Rule" for setting the interest rate target is a widely used benchmark to evaluate the stance of monetary policy.

can further improve the Fed's performance. I see three lessons coming out of the policy failures of 2008-09:

**1. Policy needs to target the market forecast.** In 2008, Fed officials relied too much on economic models and not enough on market forecasts. An optimal monetary policy is one that results in the market consensus expecting success. If the Fed is targeting nominal GDP growth of 4%, then the market should forecast 4% nominal GDP growth

**2. We need some sort of level targeting regime.** Preferably this would be a level targeting of NGDP, but even price level targeting would be far superior to the current "let bygones be bygones" inflation-targeting regime. The purpose of level targeting is not just to correct past mistakes and provide long-term predictability for the path of NGDP, although that's a worthy goal. More importantly, level targeting would help stabilize the economy by reducing the volatility of velocity. In the past, one of the biggest sources of volatility has been instability in the long-run path of monetary policy.

**3. Policymakers need to adopt a "whatever it takes" approach to policy.** The primary tool should be open-market purchases and sales of government securities. If not enough securities were available it would be better to adopt unconventional policies such as purchases of alternative assets and/or the adoption of negative interest on reserves, rather than just having policymakers throw up their hands and ask for assistance from fiscal authorities. Congress is simply not equipped to implement an effective countercyclical fiscal policy regime. Exhibit A is the major tax cut implemented in 2018, a period of only 4% unemployment.

The adoption of these three policy principles has the potential to greatly moderate the business cycle, while continuing to minimize the so-called "welfare cost of inflation," which is actually the welfare cost of excessively high and unstable NGDP growth. But of course the devil is in the details, and we need to think about two specific issues; what is the appropriate policy target, and how can we best insure that the stance of monetary policy leads to on-target market forecasts of growth in aggregate demand?

## **2. Is NGDP Targeting Optimal? If So, At What Rate?**

Throughout this book there's been an assumption, either implicit or explicit, that unstable nominal GDP growth creates economic problems, especially for the labor and financial markets. But this does not necessarily mean that NGDP targeting is desirable. Indeed, I very much doubt that the optimal monetary policy target is precisely equal to NGDP.

To see why NGDP targeting is not always optimal, consider country such as Kuwait, where oil production makes up a large share of GDP. Obviously a small country like Kuwait has relatively little impact on the global price of oil. If the global price of oil

were to suddenly rise from \$50 a barrel to \$100 a barrel, and if Kuwait's oil output remained fairly stable, then nominal expenditure on Kuwaiti oil would roughly double. If the Kuwaiti central bank were engaged in NGDP targeting, then nominal expenditure on goods other than oil would have to plummet sharply, perhaps triggering a depression.

The preceding thought experiment demonstrates that NGDP targeting is not some sort of magic bullet that solves all macroeconomic problems. The standard argument is that NGDP instability creates problems for the labor market because changes in NGDP are closely correlated with changes in total labor compensation in countries like the US. Because hourly nominal wage rates are sticky in the short run, any change in total labor compensation is likely to produce similar changes in total hours worked. In a country like Kuwait, however, there is much less correlation between changes in NGDP and changes in total labor compensation. The oil industry is not very labor-intensive, relying more heavily on natural resources and physical capital. When oil prices soar, so do profits for the state-owned Kuwaiti oil company.

My own view is that a monetary policy aimed at targeting total nominal labor compensation per capita may be slightly preferable to an NGDP target. However, in the US there is not likely to be much difference between the expected growth rate of NGDP and the expected growth rate of total nominal labor compensation. In that case, NGDP targeting may be relatively close to the optimal monetary policy. Keep in mind, however, that NGDP targeting is likely to be less effective in countries where unstable commodity markets represent a larger share of GDP. Thus NGDP is a slightly less reliable indicator of monetary stability in a major commodity producer such as Australia, than it is in a highly diversified economy such as the United States.

If we take NGDP as a reasonable approximation of the optimal policy target, the next task is to choose an appropriate growth rate? And should the growth rate be adjusted occasionally in order to offset shocks to productivity, thus keeping inflation stable in the long run? Here I can't emphasize enough that with NGDP targeting, unstable inflation is a *feature not a bug*. Most economists think of inflation and real GDP as being the key variables, whereas NGDP growth (the sum of these variables) is a sort of ungainly hybrid, like a minotaur---half man/half beast. To market monetarists NGDP is the "real thing" whereas inflation is an almost meaningless data point created by government bureaucrats lacking any coherent economic model for their work.

Given how often economists talk about inflation, and how much effort the central banks put into targeting the variable, you might assume that economists have a pretty clear idea what the CPI is supposed to measure. Nothing could be further from the truth. Consider the example of "entry level luxury cars." How rapidly did they rise in price between 1986 and 2016? In fact, there is no way to answer that question, or more precisely there are many different ways, and no clear way of determining which approach is correct. Consider these two approaches:

A. An entry-level luxury car like the Acura Legend sold for \$22,500 in 1986. By 2016 the Legend was no longer produced, but a Honda Accord selling for \$22,500 was better than the 1986 Legend in almost any possible way you could measure quality. Bigger, safer, more powerful, more luxurious, more durable, more features, etc. So in that sense the price of an entry-level luxury car has fallen since 1986, you get more for your money today.

B. Now let's think of an entry level luxury car not as just a bundle of mechanical attributes, but rather as a fashion statement. In 1986, a person could impress their neighbor by parking an entry-level luxury car in their driveway for \$22,500. By 2016 they might have had to spend \$33,750 to get a car considered "entry level luxury." So in that sense the price of cars had risen by roughly 50%.

So which is it? Which do economists consider to be the "correct" way of measuring inflation? In fact, there is no consensus on this issue at all; indeed I'm not sure how many economists even understand how far we are from a clear definition of inflation. To most average Americans, 50% inflation in entry-level luxury cars would be the right figure. Average people are unimpressed by the claims of economists that TV prices have fallen by more than 90%, due to the enormous improvement in picture quality. To most Americans, the concept of "cost of living" means something like "the cost of living the way we live now". As quality improves, people expect to have better TVs, cars, cell phones, etc. They want to know how much more they need to make to "keep up with the Joneses."

Most economists are slightly condescending about the public's view of inflation, and would insist that you need to adjust prices for quality changes. And there are cases where that makes sense. If automobile tires last for 30,000 miles instead of 10,000 miles, then just looking at the price of tires will overstate the inflation rate for tire services. But the economists' view also has its flaws. After all, in economics the ultimate barometer of value is supposed to be "utility." And since humans are social animals, it may well be that a psychological concept like utility is more accurately described in case B than in case A. Maybe you need to buy a \$33,750 car in 2016 to get the same utility that someone could have derived from a \$22,500 car in 1986. Maybe it's prestige that determines utility, where you are in the pecking order, not the physical attributes of a car.

But if utility is what matters, as economic theory seems to imply, then what are we to make of the fact that surveys of Americans don't indicate any increase in average levels of happiness since the 1950s? This would seem to imply that there has been no increase in real income, properly defined, and all of our nominal gains have been pure inflation. That's actually not my view, but these thought experiments do raise a real issue---there is no *objective* measure of inflation, because the variable has never been properly defined. Thus it's not just a question of "biased" estimates, we wouldn't be able to come up with an objective measure of inflation even if we had perfect information about the world. We don't know what we are trying to measure.

Interestingly, John Maynard Keynes had the same intuition, as this passage from his *General Theory* demonstrates:

But the proper place for such things as net real output and the general level of prices lies within the field of historical and statistical description, and their purpose should be to satisfy historical or social curiosity, a purpose for which perfect precision -- such as our causal analysis requires, whether or not our knowledge of the actual values of the relevant quantities is complete or exact -- is neither usual nor necessary. To say that net output today is greater, but the price-level lower, than ten years ago or one year ago, is a proposition of a similar character to the statement that Queen Victoria was a better queen but not a happier woman than Queen Elizabeth -- a proposition not without meaning and not without interest, but unsuitable as material for the differential calculus. Our precision will be a mock precision if we try to use such partly vague and non-quantitative concepts as the basis of a quantitative analysis.

Keynes suggested some alternative variables. One key variable in the *General Theory* is of course aggregate demand, which we can proxy with nominal GDP. And then Keynes points to two other important variables:

In dealing with the theory of employment I propose, therefore, to make use of only two fundamental units of quantity, namely, quantities of money-value and quantities of employment. . . .

We shall call the unit in which the quantity of employment is measured the labour-unit; and the money-wage of the labour-unit we shall call the wage-unit.

The “wage-unit” is what I’ve been calling nominal hourly wages. Recall that nominal GDP, total hours worked, and nominal hourly wages are the key variables in my musical chairs model of the business cycle. Keynes correctly saw the instability of capitalism as being caused by unstable NGDP combined with sticky wages, resulting in unstable employment levels. You can toss in prices and output if you like, but they don’t really add anything substantive to the model.

If NGDP targeting is politically infeasible, it is certainly possible to create an NGDP/inflation targeting hybrid by gradually adjusting the trend rate of NGDP growth to match long run changes in the trend rate of real GDP growth. That would still deliver at least 90% of the benefits of NGDP targeting, and it would keep inflation close to 2% over the entire business cycle. But it would be an entirely unnecessary tweaking of the model, done merely to placate people who are unaware of the underlying logic of NGDP targeting.

One common criticism of NGDP targeting is that the public understands the logic of inflation targeting, but doesn’t know anything about NGDP. I would argue that almost the exact opposite is true. Back in 2010, inflation fell below 1% and Ben Bernanke discussed the need to boost the rate of inflation back up to 2%. There was a firestorm of criticism on talk radio, and many Americans wondered why the Fed was trying to raise the cost of living when they were already suffering from a housing crash and high unemployment. In fact, not one American in a hundred

understands the logic of inflation targeting. Most assume that the lower the rate of inflation the better.

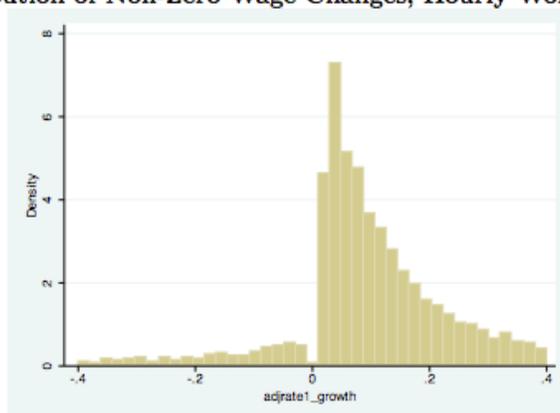
The problem here is that Americans don't understand the distinction between supply-side inflation and demand-side inflation. When picturing the effects of inflation, they tend to hold their own nominal income fixed. Thus inflation seems like something that would lower their real income. In practice, they are envisioning supply-side inflation, which really does reduce real income of Americans. But in 2010 Bernanke was proposing higher demand-side inflation, and in a depressed economy an increase in aggregate demand boosts both prices and real output. That means that the real income of Americans rises when there is demand-side inflation, at least in the short run. Yet very few Americans understand this distinction.

In contrast, suppose Bernanke had made the following statement in 2010: "The Federal Reserve has determined that the US economy is healthier if the average income of Americans grows by roughly 4% per year. In recent years income growth has been far lower, and we are implementing an expansionary monetary policy to raise the average income of Americans." Would that statement have caused as much confusion as Bernanke's call for a higher cost of living for Americans? Almost certainly not, but most economists overlook this messaging problem and continue to assume that the public understands inflation targeting, despite overwhelming evidence to the contrary. Economists are too close to their abstract models, and often lose sight of how average people think about macroeconomic concepts.

So let's say the Fed does decide to target NGDP, maybe even adopt level targeting. What trend rate of NGDP growth should they shoot for? Like almost everything in economics, there are costs and benefits of higher and lower NGDP growth. The major cost of rapid NGDP growth results from distortions in our tax system. Higher NGDP growth raises nominal returns on capital, and this leads to higher taxes on capital income. In many public finance models the optimal rate of taxation of capital income is zero. Thus the higher the rate of NGDP growth, the higher the rate of taxation of capital, and the lower the level of saving and investment.

There are two primary problems with excessively low NGDP growth, both associated with a zero bound problem. As the trend rate of NGDP growth slows, the percentage of workers who need nominal pay cuts to stay employed will increase. Because there is a psychological barrier to nominal wage cuts (due to money illusion), excessively slow NGDP growth makes the labor market less efficient. Unemployment is higher than optimal, because of downward sticky wages. How do we know that there is money illusion? If money illusion did not exist then the distribution of wage gains would be roughly bell-shaped. Instead there is a sharp break at 0%.

Figure 5: Distribution of Non-Zero Wage Changes, Hourly Workers, 1996 Panel



Barattieri, Alessandro, Susanto Basu, and Peter Gottschalk. "Some Evidence on the Importance of Sticky Wages." NATIONAL BUREAU OF ECONOMIC RESEARCH (NBER). Accessed May 25, 2017. <http://www.nber.org/papers/w16130>.

There is also a zero bound problem for interest rates. Contrary to the claim of the Keynesians, the zero bound issue does not make monetary policy ineffective. But it can lead to a dramatic increase in the size of the central bank balance sheet, forcing central banks in places like Japan and Switzerland to buy vast quantities of assets. This is the “socialism or inflation” dilemma discussed in chapter 19. If we assume that the public doesn’t want central banks to hold vast quantities of private sector assets, then it is important to set the trend rate of growth in NGDP high enough to keep the economy above the zero bound for interest rates.

I’m not certain exactly which rate of NGDP growth is optimal, but something on the order of 3% or 4%, per capita, seems like a reasonable compromise. In the long run, those sorts of growth rates should keep both zero bound problems (nominal wages and nominal interest rates) at manageable levels, while also avoiding the extremely high tax rates on capital seen in high inflation periods such as the 1970s.

The most important goal should be maintaining stable growth in NGDP---the exact rate chosen is far less important. Indeed the optimal growth rate for NGDP will depend on how heavily capital income is taxed---any model of the “welfare costs of inflation” that excludes that issue should be heavily discounted.

### 3. NGDP Futures Targeting

So let’s say the Fed decides on a 4% NGDP target, level targeting. They commit to doing whatever it takes to hit their target---or at least to achieve a situation where the market expects them to hit their target. How do they decide where to set their policy instruments? And what policy instrument should they use?

Let’s work back from the second question. It’s easy to describe what policy instrument they should *not* use---interest rates. Interest rates are one of the very worst possible policy instruments, as the instrument becomes ineffective when

rates fall slightly below zero. Using interest rates is like buying a car with steering that works fine 90% of the time, and then locks up on twisty mountain roads. The interest rates instrument locks up when rates fall slightly below zero, but that's likely to be in the midst of a deep recession, *when you most need an effective monetary policy*.

Almost any alternative would be superior to interest rates, including the monetary base, the exchange rate, or even the price of gold. While exchange rates seem to work fine for small economies like Singapore, they are probably not a practical tool for the US. If the Fed tried to adjust exchange rates in such a way as to hit its policy goals, there would be howls of outrage from other countries that experience what they view as undesirable moves in their exchange rate against the dollar. Of course any monetary policy will influence the exchange rate, but the politics of directly targeting the exchange rate make this tool an unlikely choice for the US.

As much as I oppose the use of interest rates as a policy instrument, most central banks are committed to the use of this policy tool. Thus any proposed monetary policy rule should be flexible enough to allow for short-term interest rate as a policy tool.

So let's then move on to the next question: how does the central bank decide where to set the policy instrument? Indeed, to many people this is all there is to monetary policy, deciding where to set interest rates. In fact, it's a less important decision than determining the policy goal (such as NGDP level targeting), but it is nonetheless a significant issue, worth careful thought.

The most famous model for setting the policy instrument is the Taylor Rule, which uses a formula for setting the fed funds target based on recent levels of output and inflation. For a period of several decades, the Taylor Rule provided a plausible approximation of the method by which the Fed set interest rates. But during the 2000s, the rule seemed increasingly misleading. The basic problem is that the Taylor Rule assumes that the natural real rate of interest is stable, whereas in fact it has been gradually declining over time. Thus adherence to the Taylor Rule would have led to excessively contractionary monetary policy after 2002. Indeed policy was too contractionary after 2007, even though at times it was more expansionary than recommended by the Taylor Rule.

Interestingly, the Taylor Rule was supposed to fix some of the problems associated with simpler monetary supply rules proposed by monetarist like Milton Friedman, who favored a steady increase in the M1 or M2 money supply, at roughly 3%/year. When velocity became unstable during the early 1980s, these sorts of rules fell out of favor. The problems with the Taylor rule after 2002 are eerily similar to the problem with previous monetarist proposals---it is dangerous to rely on the

assumptions that key parameters in the model will remain stable, after a new monetary regime is adopted.<sup>9</sup>

Despite the problems with previous policy rule proposals, I do believe that some sort of rule is necessary. But the rule needs to focus more on the policy goal, and less on the instrument. Instead of requiring central banks to set their instrument according to some sort of rigid formula, we need a rule where central banks are required to set their policy instrument at a position that is expected to achieve their publicly announced policy goals. Thus if the goal is 4% NGDP growth, the central bank should be required to set the policy instrument at a position expected to achieve 4% NGDP growth.

In 1989, I proposed using futures markets to target NGDP. Over the years, this proposal has been widely misunderstood, even by prominent economists such as Ben Bernanke and Michael Woodford.<sup>10</sup> So it will be useful to consider the intuition behind this proposal, one step at a time.

Let's start with the 12-member FOMC, and assume that they wish to target NGDP growth at 4.0%/year. How can we motivate them to set the policy instrument (the monetary base or the fed funds rate) at the correct position? One idea is to reward FOMC members who made the correct decision with a monetary bonus, and punish those who made a poor decision by docking their pay. If this proposal had been in effect during 2008-09, then the hawks would have been punished for being too contractionary to hit the target. If in effect during the 1970s, the doves would have seen their pay being docked for being too expansionary.

Here's how the system might work. Each member votes on a policy instrument setting. The actual policy instrument is determined by the median FOMC voter. Those that took a more dovish position can be viewed as predicting below 4.0% NGDP growth, while those who took a more hawkish than average position are implicitly forecasting above 4.0% NGDP growth. When the actual numbers are announced one year later, those who guessed right might get a \$1000 bonus, while those who guessed wrong would pay a \$1000 fine.

This is just the first step. The "wisdom of crowds" suggests that we should expand the FOMC to more than 12 members, indeed why not allow all 7.3 billion humans to have a vote on the FOMC? Obviously most people would choose not to participate, as they have little interest in risking \$1000 on an issue that they know little about. But surely some people would be willing to vote on the appropriate instrument setting for monetary policy.

---

<sup>9</sup> Goodhart's Law (named after Charles Goodhart) says that a monetary policy indicator will become less reliable as soon as the central bank begins to target that indicator.

<sup>10</sup> See Bernanke and Woodford (1997).

The next step is to move beyond “one man, one vote” to a regime of “one dollar one vote”, which is how things are done in “efficient” asset markets. Now the Fed would stand willing to buy and sell unlimited quantities of NGDP futures at a given price, say \$4000. The policy instrument is set at a position where the longs and shorts roughly balance out. When the actual NGDP is announced a year later, the speculators are paid off based on the difference between the actual NGDP growth and the Fed’s policy goal (assumed to be 4.0% NGDP growth.) Thus if actual growth comes in at 4.2%, then the contracts are valued at \$4200 at maturity, and those who took a long position make a \$200 profit on each contract, while those taking a short position incur a \$200 loss. If NGDP comes in at 3.7%, then the short sellers earn a \$300 profit and those with a long position lose money.

Later I’ll describe a modified version of this proposal, which addresses four common criticisms of this plan. Before doing so, however, I want to emphasize that I believe even this simple version of NGDP targeting would work fine, and that the following four critiques do not raise any important objections. Let’s consider each criticism in turn:

1. The circularity problem. In 1997, Ben Bernanke and Michael Woodford published a paper arguing that NGDP (and CPI) futures targeting was subject to a “circularity problem.” If central bankers used futures markets to guide policy decisions, and if markets had faith that the central bank would take whatever steps are needed to offset the effect of economic shocks, then futures markets would never provide the sort of signals that the central bankers needed to adjust policy. The NGDP futures price would stay at \$4000, providing no market signal to the Fed that easing or tightening is needed. The term ‘circularity problem’ refers to the fact that central bankers would be looking to markets for guidance, and markets would be looking to central bankers for guidance.

But this criticism does not apply to my 1989 NGDP targeting proposal. In that regime, the important point is not that the markets are predicting the future level of NGDP (although they are), rather that they are *predicting the instrument setting that would lead to on target NGDP growth*. The actual price of NGDP futures is always exactly \$4000 during the period when they are being targeted, because the central bank promises to buy and sell unlimited quantities of these futures contracts at the target price. If this scheme were subject to a circularity problem that made it infeasible, then this would be equally true of the classical gold standard (where the Treasury pegged gold prices at \$20.67/ounce from 1879 to 1933), or the Bretton Woods fixed exchange rate system. The system I proposed in 1989 would effectively elicit market forecasts of the optimal instrument setting, which does not involve any circularity problem.<sup>11</sup>

---

<sup>11</sup> Indeed even Bernanke and Woodford acknowledged that having the market forecast the appropriate policy instrument setting was a way to circumvent the circularity problem.

2. Inefficient markets. Not everyone accepts my claim that the EMH is approximately true, and that asset markets are efficient. What if there were a speculative bubble in NGDP future prices? In that case, the price of NGDP futures might diverge from the optimal forecast of future NGDP, leading to a risk premium in NGDP futures prices. Obviously anything is possible, but I'd argue that NGDP futures are about the least likely market to suffer from speculative bubbles. Indeed there is so little interest in trading NGDP futures contracts that this sort of market does not even exist, despite the fact that NGDP is not even currently being targeted. So there's not much demand to hedge against NGDP risk. Any risk premium embedded in NGDP future prices is likely to be quite small, far less than 100 basis points. While the NGDP risk premium might be regarded as significant from a financial market perspective, it would be of little consequence from a macroeconomic stability perspective. Furthermore, only a time-varying risk premium would cause macroeconomic instability.

In addition, research suggests that bubbles are more likely to occur when the market consists of people with similar perspectives, rather than a large and diverse set of traders. A small FOMC is much more prone to the dangers of "groupthink" than a large and diverse asset market.<sup>12</sup>

3. Some point to the non-existence of a NGDP futures market as an argument against NGDP futures targeting. What if no one traded NGDP futures contracts? My response is that if no one traded NGDP futures, then policy would be on the right track. During late 2008, I would have been frantically selling NGDP futures short, in anticipation of what was obviously going to be a sharp decline in actual NGDP. If no one else were trading the contracts, I could have become quite wealthy.

This is one of the features I like best about NGDP targeting. No, not the idea that I could become fabulously wealthy---indeed just the opposite. I'm quite fatalistic about get rich quick schemes; I don't ever expect to win the lottery. What I like about this sort of thought experiment is that it shows that if NGDP futures targeting failed then *it would be easy to become wealthy*. Because I am skeptical that it will ever be easy for me to become wealthy, I don't expect NGDP targeting to fail.

4. Some people argue that an NGDP futures market might be subject to market manipulation. Suppose a wealthy person bought lots of NGDP futures contracts. That would trigger a contractionary monetary policy response (as going long on NGDP is an implied prediction that NGDP growth will overshoot the target.) The worry is that a speculator might then make side bets in other markets impacted by

---

<sup>12</sup> See Henry W. Chappell Jr., Rob Roy McGregor, and Todd A. Vermilyea, *Committee Decisions on Monetary Policy: Evidence from Historical Records of the Federal Open Markets Committee* (Cambridge, MA: MIT Press, 2005). Also Marco Battaglini, "Policy Advice with Imperfectly Informed Experts," *Advances in Theoretical Economics* 4, no. 1 (2004): 1. And Clare Lombardelli, James Talbot, and James Proudman, "Committees versus Individuals: An Experimental Analysis of Monetary Policy Decisionmaking," *Bank of England Quarterly Bulletin* 42, no. 3 (2002): 262-73.

monetary policy—say going short on equities. Tight money might depress stock prices. Then even if they lost money in NGDP futures, they could profit in their side bet on stocks.

This sort of scheme is much harder to pull off than it might appear.<sup>13</sup> If you did succeed in making monetary policy too contractionary to achieve the policy target, then other speculators could profit at your expense by taking a short position on NGDP futures, thus pushing policy in the opposite direction. If this were a feasible strategy, then why didn't this sort of manipulation occur under a fixed exchange rate regime. Thus George Soros might sell large quantities of a currency, forcing a tightening of monetary policy and perhaps triggering a decline in domestic equities. And yet I don't recall people using the "market manipulation" hypothesis as an argument against fixed exchange rate regimes, including the gold standard. People who worry about market manipulation think they have found a special flaw with NGDP futures targeting, but the argument proves too much, as the same objection would apply to numerous other systems that seemed to work just fine over a period of decades.

Even though I don't find any of the preceding criticisms of NGDP targeting to have merit, it turns out that there is an alternative approach that delivers almost all the benefits of NGDP futures targeting, without any of the problems that critics have pointed to.

#### **4. Setting Guardrails on Monetary Policy**

It turns out that there is a much simpler and less controversial way of using NGDP futures contracts in monetary policy.<sup>14</sup> Let's start with the assumption that central banks are worried about unforeseen events and thus are reluctant to give up all discretion. But let's also assume that they are open to rules that make their job easier. As an analogy, you might like the freedom to drive your car wherever you wish, but also appreciate the safety provided by guardrails, which put constraints on where you can drive your car.

Imagine the following conversation with a central banker (CB):

Me: Why not set a 4% NGDP growth rate target?

CB: There might be times when a 4% growth rate is not appropriate.

Me: OK, but surely there is some range of NGDP growth that if breached would not be consistent with your dual mandate?

---

<sup>13</sup> See Robin Hanson, Ryan Oprea, and David Porter (2006).

<sup>14</sup> I got the basic idea for this approach from William Woolsey, "Index Futures Targeting and Monetary Disequilibrium" (unpublished paper, January 2013).

CB: Yes, I suppose an NGDP growth rate of below 2% or above 6% would be pretty clearly destabilizing.

Me: Then why don't you offer to sell unlimited NGDP futures contracts at a price implying 6% NGDP growth, and buy unlimited contracts at a price implying 2% NGDP growth?

CB: I'm not sure we can trust this futures market to set monetary policy. Markets are occasionally prone to irrational behavior, to bubbles.

Me: You don't have to let the NGDP futures market set policy, you are free to set monetary policy wherever you wish, as long as you promise to buy and sell NGDP future contracts at the two extremes.

CB: But what if most investors took either a long or short position, we might lose lots of money.

Me: You just told me you think you are smarter than markets, which are occasionally irrational. In that case, you'll make money on average. But if deep down you don't believe that you are smarter than the markets, then don't set policy at a position where almost everyone thinks NGDP growth is going to be far too high, or far too low.

I see this as a way for central banks to dip their toe into the water, to get used to markets taking a modest role in directing policy. Actually, markets already play a role, but in a far less efficient way. The Fed already pays attention to TIPS spreads, which offer a crude forecast of inflation. They already pay attention to the fed funds futures market, which forecasts future policy settings by the Fed. They even react to the stock market. NGDP futures are a far more efficient way of bringing market expectations into the policymaking process, because they reflect market expectations of the variable that policymakers *actually care about*---aggregate demand.

Setting the guardrails at 2% and 6% would still allow a fair bit of discretion---too much in my view. Recessions would still occur, as when NGDP growth suddenly slowed from 5.5% to 2.5%. But once this framework was in effect, it would be easy to gradually narrow the guardrails. Perhaps in the second year the limits could be set at 2.1% and 5.9%. After two years they could be narrowed to 2.2% and 5.8%. After 10 years, the guardrails might be 3% and 5%, which is narrow enough to dramatically moderate the business cycle. Recall that in 2008 the growth rate of NGDP slowed from the usual 5% to something close to *negative* 3%, the sort of dramatic slowdown that would be nearly impossible under a 3%/5% guardrails regime.

These sorts of NGDP futures guardrails would be sort of like the beeping sound that your car makes when you back up too close to an object. You can override those

beeps and continue backing up, but you are incurring a risk of accident. The central bank can ignore the fact that 99% of speculators are selling 2% NGDP growth contracts, expecting even lower than 2% growth, but the central bank will have been warned, and better have a very good excuse ready if there is a deep recession and Congress asks them why they recklessly ignored the market forecast.

Here's another way of thinking about the policy. If a 3%/5% guardrails regime had been in place in 2008, then either one of two things would have happened:

1. The Fed would have noticed lots of speculators taking a bearish position, and eased policy enough to support adequate NGDP growth.
2. The Fed would have ignored the futures markets, and I would have become very wealthy taking a short position in NGDP futures.

Because I don't ever expect to become very wealthy, I do expect NGDP futures targeting to successfully stabilize NGDP expectations.

## **5. One Rule to Rule Them All**

There's a longstanding debate in economics centered around the issue of "rules vs. discretion" in monetary policy. Should central banks be free to choose the policy that they think best, or should their policy be constrained by a clearly spelled out policy rule.

Both sides of the debate are better at seeing the flaws of the other side than the weaknesses of their own view. Previous proponents of policy rules often sought out a mechanical formula, which the Fed could use to set the policy instrument. Thus the monetary base might grow at a fixed rate, or respond in some predictable fashion to changes in velocity. Alternately, interest rate targets might be set based on a formula such as the Taylor Rule.

Critics pointed out that a formula might work at one point in time, but not another. They argued that policymakers must have discretion to deal with unforeseen circumstances. But discretion has its own problems, leading to increased uncertainty, which can destabilize the economy. We need policy rules, but they must be the right kind of rule---robust enough to work under changing conditions.

There is only one type of policy rule that is truly robust---Lars Svensson's "target the forecast." Policy should always be set in a position where it is expected to succeed. Any other policy rule will be fragile, likely to be abandoned when conditions are not favorable.

Rules that rely on market expectations to guide policy are likely to be especially robust. One can view all previous policy rule ideas as being embedded within NGDP futures targeting. If monetarists are correct, and NGDP growth is driven by money

supply growth, then speculators will take account of money supply data when investing in NGDP futures contracts. If John Taylor is right about how interest rate targets should be set to stabilize inflation and employment, then his insights will factor into expectations of NGDP growth. As we learn more about the relationship between policy instruments and the macroeconomy, the policy rule will automatically adjust to incorporate those new insights.

In the field of monetary policymaking, the market-based approach can be seen as a sort of “end of history.” It’s almost impossible to imagine a policy superior to NGDP futures targeting, because if such a policy existed it could be used to get rich trading in NGDP futures. I don’t expect to be proved wrong about NGDP futures targeting for the same reason that I don’t ever expect to become a billionaire---markets are scarily efficient.

Fortunately, the Fed is already gradually moving in the direction of market monetarism. In early 2019, the Fed suddenly backed off from predictions of two rate increases during 2019. The change was not motivated by the output of macro models, which tend to rely on dubious concepts such as the Phillips Curve. There was no new macro data that would have justified this sudden policy change. Rather, the Fed was responding to clear market signals that two rate increases risked pushing the economy into recession.

And while the Fed has not yet adopted NGDP targeting as an official policy goal, more and more Fed officials are discussing the importance of keeping NGDP growing along a stable path. Over the past decade, market monetarism has made enormous progress, and I expect policy to continue moving in our direction.