The Promise of Nominal GDP Targeting

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MERCATUS POLICY PRIMER

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Monetary policy is important for two key reasons. First, monetary policy determines the path of the price level, and it heavily influences other variables like nominal wages and nominal GDP. As seen in the 1970s, high inflation can be damaging to the health of the economy and to the well-being of individual citizens. Savers are punished, and resources are diverted from productive investments into inflation hedges such as gold.[1] Second, monetary policy plays a big role in the business cycle. As demonstrated by the Great Depression, and to a lesser extent the global recession of 2008–2009, unstable monetary policy can lead to high unemployment and financial turmoil. Unpredictable monetary policy is especially harmful. The great amount of attention devoted to the Federal Reserve and its actions indicates that the current system is not as predictable as the market would like. A different monetary policy system could enhance predictability and ensure sound money.

This primer will present one such system: nominal gross domestic product (NGDP) level targeting. The first section will clearly define monetary policy, describe the two main methods that central banks have traditionally used to carry out policy, and analyze the weaknesses of these methods. Later sections will articulate what NGDP is and how a policy of NGDP targeting works. Subsequent sections will list the most common criticisms of NGDP targeting and explain why these criticisms are misguided, and they will present arguments in support of the policy. Finally, the primer will provide specific recommendations for how to move from the current system to a system based on NGDP futures targeting.

WHAT IS MONETARY POLICY?

Monetary policy can be defined in different ways. In one sense it is what the Federal Reserve (the Fed) does to affect the supply and demand for the monetary

1. William Poole, "How Predictable Is Fed Policy?," Federal Reserve Bank of St. Louis *Review* 87, no. 6 (November/December 2005): 659.

base. The monetary base is the type of money directly produced by the government and consists of both bank reserves and cash held by the public. Others describe monetary policy in terms of its impact on key variables such as interest rates, broader measures of money, and credit in the US economy.[2] The congressionally mandated goals of monetary policy are to maintain stable prices, promote full employment, and achieve moderate long-term interest rates.[3] Because the Fed believes that price stability is the best way to achieve moderate long-term interest rates, as a practical matter this is treated as a dual mandate: price stability and high employment.

The Fed uses four main tools to carry out monetary policy. Two of these tools are methods for increasing or decreasing the size of the monetary base. The most important tool is open market operations, which is the buying and selling of government securities. Buying securities directly puts more base money into the economy, while selling securities takes money out. This has an indirect effect on interest rates, the quantity of bank-created money (deposits), and other important economic variables.

The second tool is the discount rate, which is the interest rate charged to depository banks for short-term loans from the Federal Reserve. Adjusting this rate influences the amount of discount loans, which are loans of base money to commercial banks. As with open market purchases, discount loans increase the monetary base. Lower interest rates incentivize more borrowing, whereas higher rates discourage borrowing.

The other two Fed tools affect the demand for base money. One tool is reserve requirements. Bank reserves include cash held in their vaults and deposits that member banks must keep at the Federal Reserve. Increasing reserve requirements means that banks must hold more in reserves, which serves to increase the demand for base money. This is a contractionary policy. Cutting reserve requirements reduces the demand for base money. This is an expansionary policy.

The most recent tool is interest on bank reserves, an option Congress gave the Fed in 2008.[4] Higher interest rates on bank reserves tend to increase the

2. Broader measures of money are different from the monetary base because they also include money-like assets created by banks and other financial firms that can be easily turned into purchasing power. For example, M2 is a measure of money that includes cash, checking deposits, savings deposits, money market accounts, and other time deposits.

3. The law passed by Congress to this end is the Humphrey-Hawkins Full Employment Act of 1978, Pub. L. No. 95-523, 92 Stat. 1887 (1978).

4. The Financial Services Regulatory Relief Act of 2006 authorized the Fed to pay interest on reserves held by depository institutions. Pub. L. No. 109-351, 120 Stat. 1966 (2006).

demand for bank reserves, which is contractionary. Lower interest rates on bank reserves tend to reduce the demand for bank reserves.

The Federal Open Market Committee (FOMC) decides when and how to use these tools. This committee is composed of 12 members.[5] The current monetary policy system is considered discretionary because these 12 individuals decide on a course of action based on their personal judgments.

To get a better understanding of how these tools work, it's useful to apply the supply-and-demand model to base money. Recall that greater demand for a product makes its value rise, and vice versa. Greater supply of a product makes its value fall. Money is no different, but it's a bit harder to see because money has a fixed nominal value. A dollar is always a dollar in nominal terms. In real terms, however, things are very different. A dollar today can only buy as much as six cents bought 100 years ago. The reason is simple: the huge increase in the supply of base money greatly reduced its value. Since the nominal value of a dollar is always $1, the change in its value, that is, the change in its purchasing power, had to occur through a rise in the price of other goods (inflation).

Now let's revisit the four tools. Open market purchases and lower discount rates are both inflationary because they increase the supply of base money and reduce its value. Higher reserve requirements and higher interest on reserves are deflationary because they increase the demand for base money. Thus, while the four key Fed policy tools seem very complex, they are all simple applications of basic supply-and-demand theory.

Nonetheless, the media typically ignores changes in the monetary base and focuses on the impact of these policy tools on the federal funds interest rate. Commercial banks that have excess reserves with the Fed may lend to other commercial banks that need to supplement their reserves. The federal funds rate is the rate that a depository institution charges to lend excess reserves to another depository institution. The media tends to focus on this because the Fed itself tends to use the federal funds rate as a short-term target, so changes in that rate are seen as revealing changes in the stance of monetary policy.

The Great Moderation, a period of stable inflation and NGDP growth lasting from roughly 1984 to 2007, led many to believe that monetary authorities had

5. There are 12 regional Federal Reserve Banks. Each regional bank has a board of directors, and each board appoints a president. The voting members of the FOMC are the president of the New York Federal Reserve, the seven members of the Board of Governors in Washington, DC, and presidents from four of the other regional banks. Regional presidents serve one-year terms as voting members on a rotating basis. Though only four regional presidents are voting members of the FOMC, all presidents of regional banks participate in FOMC meetings.

mastered the art of policy. Inflation fell to a level of roughly 2 percent, and the business cycle, which is the constant cycle of expansions and contractions in the economy, became more stable. The financial crisis and ensuing recession, however, have challenged that belief. Perhaps most importantly, the crisis and recession have highlighted disagreements about the fundamental nature of monetary policy and why it is or is not effective. Esteemed economists have argued for different policy tools and different models.[6] Not only do economists disagree about which models to use, but they also disagree about how to use those models.[7]

Unfortunately, even within the Fed there is much disagreement. This makes it much harder to predict the future path of monetary policy, which makes the economy less stable. Under a discretionary policy regime, market participants must try to anticipate how the members of the FOMC will act. This kind of guessing game is not conducive to predictability and economic stability.

In order to move to a better system, policymakers need to first consider what economists generally agree to be a good outcome. While there are naturally some differences of opinion, stable growth in NGDP is increasingly seen as a reasonably good outcome.

ALTERNATIVE POLICY METHODS

Before discussing NGDP targeting as an option for the Fed, it is useful to first review two nondiscretionary systems that have had significant support. The first is a commodity standard, and the second is a rules-based fiat money system.

Under a commodity standard, the unit of currency is convertible to a specified commodity at a fixed rate; historically this was generally gold or silver. This means the price of the commodity used as the standard is kept fixed. For instance, the price of gold was fixed at $20.67 per ounce from 1879 to 1933, and then at $35 per ounce from 1934 to 1968. This also constrains the quantity of money. The money issuer cannot create more money without possessing sufficient stocks of the commodity to back it up. The three main arguments for a commodity standard are that it leads to stable prices in the long run, serves as an

6. For example, Michael Woodford favors using interest-rate instruments to stabilize the price level. Bennett McCallum favors using monetary-base instruments to stabilize NGDP growth. Milton Friedman desired stable growth in broad monetary aggregate measures. Robert Hall advocates for adjusting interest on bank reserves to achieve a stable price level.

7. Some proponents of Taylor rules argued that money was too tight in the recession, whereas Taylor himself used the same rules to conclude that money was not too tight. See John B. Taylor, "The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong" (NBER Working Paper No. 14631, National Bureau of Economic Research, Cambridge, MA, January 2009).

automatic mechanism for determining the money supply, and prevents governments from paying for increased spending simply by printing money.[8]

There are also criticisms of commodity money standards. First, there is a resource cost. Land, labor, and capital must be used to acquire the commodity that is used for monetary purposes. As a practical matter, this is probably not a significant issue because gold demand as an inflation hedge (and the price of real gold) has remained relatively high even after the world switched to a fiat money system. A bigger concern is that, under a commodity standard, the central authority may not be able to increase the money supply in times of crisis, when the demand for money is often much higher. This lack of flexibility can lead to deflation and depression.[9]

A rules-based fiat money regime also has proponents and critics. Proponents point to the fact that a policy rule limits the discretion of the monetary authority. This increases predictability and strongly reduces the ability of monetary authorities to use monetary policy to achieve political aims. For instance, some critics claim that the Fed inappropriately adopted an expansionary monetary policy in 1972 to help Richard Nixon get reelected. At the end of the 1970s, the replacement of one Fed chairman by another led to dramatic swings in monetary policy, which played a role in destabilizing the economy.

Bennett McCallum argues that rules serve the double purpose of reducing discretion (and therefore enhancing predictability) while also preserving the monetary authority's ability to take action when needed to achieve the policy goal. In times of crisis, the authority can still act according to the rules that are in place.[10] These rules enable the authority to help when needed and assure market actors that actions will follow a predictable plan.

Critics of a policy rule worry that it might prevent the Fed from acting as needed in a crisis, especially if there were some sort of unforeseen shock to the economy. One of the most famous policy rules is called the Taylor Rule. In 1993, John Taylor proposed a mathematical formula for adjusting the federal funds rate target in response to undesirable movements in inflation and output. The goal was to keep inflation close to 2 percent and output close to potential (full employment). When the Taylor Rule called for a more expansionary policy, the

8. Lawrence White, *The Theory of Monetary Institutions* (Hoboken, NJ: Wiley-Blackwell, 1999), 39–41.
9. Ben Bernanke and Harold James, "The Gold Standard, Deflation, and Financial Crisis in the Great Depression: An International Comparison," in *Financial Markets and Financial Crises*, ed. R. Glenn Hubbard (Chicago: University of Chicago Press, 1991), 33–68.
10. Bennett McCallum, *Monetary Economics: Theory and Policy* (New York: Macmillan, 1989), 336–48.

Fed would reduce its interest rate target, and vice versa. Critics claimed that there could be periods when the Taylor Rule might give misleading signals to policymakers (e.g., the aftermath of the 2008 financial crisis). In such cases, slavishly following the Taylor Rule could lead to an undesirable outcome, such as greater volatility in either the inflation rate or the output gap.[11]

WHAT IS NGDP?

GDP is the monetary value of all of the goods and services produced within a nation's borders in a given period of time. GDP can be measured in real or nominal terms. Real GDP is adjusted for inflation. This is meant to account for the fact that one dollar generally has less purchasing power now than it did in the past. Quoting GDP in real terms adjusts the total value of output for changes in the value of the dollar. It is intended to measure the actual output of goods and services in the economy in physical terms.

NGDP, on the other hand, does not make adjustments for the changing value of the dollar. NGDP gives the value of output in current dollar terms, without adjustments for inflation, of all output in the specified period of time. During a period of inflation, NGDP will rise faster than real GDP because the growth rate of NGDP is the growth rate of real output plus the inflation rate (plus a small interaction term). Before the Great Recession, NGDP growth had averaged about 5 percent since 1990, roughly 3 percent real GDP growth and 2 percent inflation.

NGDP AND MONETARY POLICY

NGDP can serve as a guide for monetary policy, as can the inflation rate, the money supply, the exchange rate, or many other possible targets. In fact, targeting a stable growth rate in NGDP would most likely also lead to a relatively stable rate of inflation in the long run. If the long-run growth trend of the economy were 2 percent, for example, then a stable 4 percent growth rate in NGDP would mean 2 percent growth and 2 percent inflation in the long run. The total value of all goods produced would grow by 4 percent, with half of this growth owing to inflation and half owing to productivity gains.

The advantage of NGDP targeting is not that it leads to a higher long-run growth rate or a different inflation rate. Rather, NGDP targeting allows inflation

11. David Beckworth and Joshua R. Hendrickson, "Nominal GDP Targeting and the Taylor Rule on an Even Playing Field" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, October 2016).

to vary in the short run in such a way as to smooth out the business cycle. It essentially prevents demand shocks (such as those experienced in 2008–2009) from hitting the economy, and it also reduces the instability that results from supply shocks. It cannot prevent supply shocks from occurring, but it can prevent them from causing unnecessary and unrelated damage to labor markets. As a counterexample, under inflation targeting, a large increase in the price of imported oil would cause the Fed to tighten policy enough to prevent a rise in inflation. Therefore, non-oil prices would fall to offset the increase in oil prices. The problem with this is that producers, who would face lower prices for their goods, would not be able to meet their wage costs and would have to lay off some workers. This is essentially the mistake, or one of the mistakes, the Fed made in 2008–2009. Under an NGDP targeting system, such a contractionary policy would not be necessary.

To repeat, the goal of NGDP targeting is a steady rate of growth in the total money value of all goods produced. Accomplishing this goal requires expanding or contracting the money supply in response to shocks to money demand. For example, if the public chose to hold more money as a share of their income, then under NGDP targeting the money supply would also increase.

NGDP targeting responds to demand shocks exactly as inflation targeting would. When a demand shock occurs, where the velocity of money increases or decreases as individuals spend more quickly or slowly, the money supply would adjust to keep NGDP on a stable growth path. Increased aggregate demand, which could lead to inflation, would be offset by a contraction in the money supply, while lower aggregate demand would cause the money supply to increase. It may help to think in terms of a simple mathematical equation:

$$\text{NGDP} = \text{price of goods} \times \text{quantity of goods} = \text{money supply} \times \text{velocity}$$

In order for NGDP to grow at a steady rate, there must be an inversely proportional relationship between the quantity of transactions and the price level. If velocity changes, the money supply moves in the opposite direction in order to stabilize NGDP growth.

ADVANTAGES OF NGDP TARGETING

One advantage that NGDP targeting has over inflation targeting is that measures of inflation are more prone to errors and subjectivity. The revenue of a given firm, which is a part of NGDP, is relatively objective and easy to collect and verify. Measures of inflation, on the other hand, rely on subjective determinations of

changes in quality over time. A phone now is very different from a phone 10 or 20 years ago, and a car now has distinct qualitative differences from a car made a decade or more ago. How much of the price change is due to quality, and how much is inflation? There is no scientifically objective way of answering that question; indeed, the answer may vary from one individual to another.

A second advantage of NGDP targeting is that it is easier for the public to understand. It is desirable that the monetary authority and the general public have roughly the same understanding of what monetary targeting means. Today, many people wrongly believe the Fed is trying to hold inflation as low as possible; however, when the inflation rate falls below 2 percent, the Fed actually tries to raise it. The public was bewildered in 2010 when the Fed announced that inflation was too low and that it was trying to raise the cost of living for Americans. The Fed could explain NGDP targeting as a method for keeping the total incomes earned by Americans growing at a rate of roughly 4 percent per year.

A third advantage that NGDP targeting has over inflation targeting is that it leads to less confusion about the roles of monetary and fiscal policy. Under inflation targeting, many people have come to believe that monetary policy deals with inflation while fiscal policy deals with output shortfalls. The reality is that both have a direct impact on aggregate demand but only an indirect impact on prices and output. If fiscal policy succeeds in increasing demand, it will also tend to increase inflation. If the Fed is targeting inflation, it will try to neutralize this effect. If the monetary authority is successful at keeping inflation at the desired level, fiscal policy will have no (demand-side) effect whatsoever. Under NGDP targeting, it's clear that the monetary authority has sole responsibility for maintaining stable growth in aggregate spending.

NGDP targeting encourages sound public policies that make the economy more efficient and promote economic growth. If the monetary authority had kept NGDP growing on the same stable trajectory during the 2008–2009 crisis, it would have been harder to advocate for bailouts of favored firms. Because total spending rises at a slow but steady rate under NGDP targeting, it would be more apparent that a bailout for one firm comes at an equal cost to another firm or firms. Furthermore, saving a failed firm would not seem like an imperative if people understood that total spending would not implode due to the dissolution of a business. Similarly, if the public understood that NGDP would grow at a consistent rate, and that this growth rate was composed of both real productivity growth and inflation, then it would be easier to advocate for policies that are conducive to growth. Tax reform and easing the burden of regulation would become

more attractive as policies for spurring growth because they would tend to hold down inflation and thus boost real incomes.

Finally, NGDP targeting would help to depoliticize monetary policy. The current system has a dual mandate of supporting full employment and maintaining a stable rate of inflation. Each of the two major parties can point to one of the mandates and argue that policy has succeeded or failed. Within the Fed, hawks and doves battle for influence, arguing over whether more emphasis should be put on inflation or on employment. Adoption of NGDP targeting would address the broad goals of the dual mandate with a single target variable, thus mitigating the political pressures facing the monetary authority.

THE MISGUIDED CRITICISMS OF NGDP TARGETING

Some of the criticism leveled at NGDP targeting stems from a misunderstanding of the policy proposal. Other objections can be addressed by modifying the way the system works.

One criticism is that it is unclear exactly how the Fed could actually achieve a stable path for NGDP. After all, monetary policy affects the economy with a lag, so it isn't always clear which money supply setting or interest rate today will lead to on-target NGDP growth over the next year or two. One way to address this problem is with an NGDP futures market. The Fed could adjust monetary policy until the price of NGDP futures contracts was exactly equal to the policy target.

Ben Bernanke and Michael Woodford have argued that a "circularity problem" could emerge from a policy where the central bank targeted market expectations.[12] The central bank would watch markets for signals of excessive demand at the same time as the market watched the central bank for cues. This means that the price of NGDP futures contracts might never move away from the target value. If the market believed the central bank's promises to be credible, and if the central bank pledged to intervene if the value of futures deviated from the target, then the price would always remain at the target. For the central bank, this means that there would be no signal to act on. However, Woodford and Bernanke acknowledged that this criticism does not hold if the market itself predicts the optimal policy setting or implements policy, perhaps by automatically triggering open market operations. As discussed below, such a regime is feasible.

12. Ben Bernanke and Michael Woodford, "Inflation Forecast and Monetary Policy," *Journal of Money, Credit and Banking* 29, no. 4 (1997): 653–84.

Another concern, called the first-mover problem, is that traders would have an incentive to wait until the last minute to make trades.[13] If NGDP were calculated and published only quarterly, traders who waited until the end of the quarter would have access to more information about the economy and the likely policy setting. This problem could be addressed with daily estimates of NGDP, derived from interpolating data from monthly data series.

This leads to a third criticism: how should revisions to NGDP data be handled? Because of data lags and changes in methodology, the estimate of NGDP for a given period is generally revised several times over the months following the initial announcement. However, as long as the revisions are unbiased, the forecast of the first estimate should be an unbiased estimate of the final revision. Therefore, a futures price linked to the first estimate should still generate an optimal monetary policy.

Another concern is that insufficient trading would occur. After all, there is currently no NGDP futures market, so perhaps there is little interest in trading such a contract. This concern misses an important point. A lack of trading does not mean that a meaningful market price does not exist. If the central bank set a price for NGDP futures contracts and no one purchased any contracts, it would presumably be a sign that market participants believe that no economic profits can be had at the given price. This is akin to a gold standard regime where the money supply is set at a level where no one chooses to redeem dollars for gold. Conversely, a situation where the bank sets a price for futures contracts that is far from what the market expects would almost certainly lead to a high volume of trading. Traders would want to purchase contracts in order to profit. Furthermore, empirical evidence indicates that prediction markets can be effective even without high volumes of trading.[14]

Some worry that futures contracts would include a risk premium due to people hedging NGDP risk. In that case, the market price of the contracts might differ slightly from the market expectation of future NGDP. The demand for NGDP futures as a hedge would probably be limited, however, because there is currently not enough demand for such a contract to be traded. Moreover, the value of NGDP does not matter nearly as much as the growth rate. If contracts consistently traded with a given risk premium built in, then the growth rate of NGDP would not change at all, and that is what is important for economic stability.

13. Roger W. Garrison and Lawrence H. White, "Can Monetary Stabilization Policy Be Improved by CPI Futures Targeting?," *Journal of Money, Credit and Banking* 29, no. 4 (1997): 535–41.
14. Justin Wolfers and Eric Zitzewitz, "Prediction Markets," *Journal of Economic Perspectives* 18, no. 2 (2004): 107–26.

Some worry that a bubble could arise in NGDP futures prices. The "bubbles" in technology stocks near the turn of the century, as well as the more recent housing bubble, have led many to worry that asset markets can be inefficient. This criticism is misguided as applied to NGDP targeting because the danger of bubbles is actually an argument in favor of the use of a futures market in NGDP contracts. Including all market participants in the monetary policy system helps to avoid the groupthink that may lead to bubbles. As a small and relatively homogenous group, the FOMC is much more likely to fall prey to a single mistaken belief about the future path of NGDP than is the large, heterogeneous pool of market participants. Indeed, researchers have found that there is pressure within the FOMC to reach a unanimous decision[15] and that inefficiency converges on zero as the number of experts included increases.[16]

Some fear that the market for NGDP futures could be manipulated. For example, a firm or individual that stood to benefit from a jump in the growth rate of NGDP could short sell a large amount of futures contracts. This would induce the central bank to take a more expansionary position, which would serve the trader's interests. Prediction markets are not easy to manipulate, however.[17] Taking a large position, either long or short, leaves one exposed to other traders who can take advantage of that position and profit from the gap between the expected market value and the manipulator's position. One way to address manipulation would be for the central bank to take the opposite position for any trades with suspected manipulators. If the central bank consistently lost money on such trades, that would indicate that the motive was not manipulation. Rather, it would indicate that traders were acting on expectations about the future market price.

The suggestion above does create risk for the central bank's balance sheet. In general, the central bank should probably adjust monetary policy so that traders are roughly equally balanced between long and short positions. In this way, the central bank can minimize risk of trading losses.

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15. 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).
16. Marco Battaglini, "Policy Advice with Imperfectly Informed Experts," *Advances in Theoretical Economics* 4, no. 1 (2004): 1.
17. Robin Hanson, "Foul Play in Information Markets," in *Information Markets: A New Way of Making Decisions*, ed. Robert W. Hahn and Paul C. Tetlock (Washington, DC: AEI-Brookings Press, 2006), 126–41; Robin Hanson, Ryan Oprea, and David Porter, "Information Aggregation and Manipulation in an Experimental Market," *Journal of Economic Behavior and Organization* 60, no. 4 (2006): 449–59.

OPERATING AN NGDP FUTURES MARKET

An NGDP futures market does not currently exist in the United States. This actually has one advantage, as it allows the Fed to set up a futures market in a way that best serves the desired purpose: providing an optimal forecast of the monetary policy most likely to achieve stable growth in NGDP.

While there are many ways that NGDP futures markets could be utilized, the simplest method is to set up a system that is analogous to a gold standard monetary regime, but with NGDP futures contracts replacing gold as the nominal anchor. Recall that even under the gold standard, many of the day-to-day transactions were done with currency notes. The difference from modern fiat money is that these notes could be converted to gold at a fixed price.

Something similar could be done with NGDP targeting. The Fed might agree to buy or sell unlimited quantities of NGDP futures to anyone who wanted to take a long or short position, with the price at maturity set at one dollar plus the target rate of growth. So if the target rate of NGDP growth is 4 percent, then the price of the contract might be $1.04. At maturation in one year, the value of these futures contracts would equal the ratio of NGDP at maturity to NGDP at the time the contract was issued. If NGDP were to grow by exactly 4 percent, then the value of the contract would still be $1.04. However, if NGDP grew by 6 percent, then the value of the contract at maturation would be $1.06, and those with a long position would earn two cents on each contract. If NGDP growth turned out to be only 2 percent, those with a short position would earn two cents on each contract.

As the buyer and seller of unlimited quantities of contracts, the Fed would be exposed to counterparty risk—that is, the risk that some market participants would not pay for their losses. To protect against this risk, the Fed could require all participants to put money into a margin account. A deposit of 10 cents per contract would protect against a roughly 10 percent (unexpected) change in NGDP, which is more than adequate protection given the historical stability of NGDP growth. At maturity, the money in a margin account would be returned with interest.

Under the gold standard, the central bank had very limited discretion over the money supply. It could produce currency notes, but if there were excessive money creation, then the public would return these notes to the central bank to be redeemed. Similarly, under NGDP futures targeting, a central bank would have some limited discretion to produce currency and bank reserves. But if too much money were being produced, leading to expectations of excessive NGDP growth, then the public would buy large amounts of NGDP futures contracts. If

NGDP were expected to grow faster than the 4 percent target, the central bank would tighten monetary policy to avoid being exposed to large capital losses. The opposite would occur if too little money were being produced and the public expected below-target NGDP growth.

Under the gold standard, the central bank would often sell gold for a slightly higher price than it bought gold. This gave the central bank a bit more discretion over policy. Similarly, under NGDP futures targeting, the Fed could start off with a modest degree of discretion by offering to take a long position on NGDP contracts priced at $1.03 and a short position on NGDP futures contracts priced at $1.05. In that case, speculators would trade with the Fed whenever they expected NGDP growth to fall outside the range of 3–5 percent per year. The Fed would have limited discretion for NGDP growth within that range.

Once the Fed becomes more comfortable with the new policy regime, it could gradually narrow the price band to target NGDP growth more precisely. In other words, switching from a discretionary to a rules-based regime can be done gradually, with the central bank learning from experience. This is important, as central banks are conservative institutions (which they should be, given the importance of sound money to the overall economy).

CONCLUSION

The 2008 financial crisis highlights the need for using NGDP futures as a guide for monetary policy. NGDP fell by roughly 3 percent from mid-2008 to mid-2009, the sharpest decline in more than 50 years. However, this was not entirely unforeseeable. Falling asset prices indicated that by late 2008 investors almost certainly expected NGDP to fall. Unfortunately, the people with this knowledge had no way to profit from it and certainly had no way to use that information to guide monetary policy. Had the Fed been operating an NGDP futures market as described above, market participants would have sold futures contracts until monetary policy was made sufficiently expansionary to keep expected future NGDP growth on target. Even if actual NGDP growth had not always remained exactly on target, the expected rate of growth would have remained stable.

A stable path of expected growth in total nominal income is essential to well-functioning labor and financial markets. Workers and firms sign wage contracts in nominal terms, with certain expectations about the future path of total NGDP. If those expectations are not met, high unemployment can result. Home buyers and businesses sign debt contracts with fixed nominal values. If growth in NGDP is not what was expected, a financial crisis can result. Adopting NGDP

futures targeting as a monetary policy regime would depoliticize policy, discourage an array of harmful policies in other areas, and make both labor and financial markets more stable.

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