



## Explaining Quantitative Easing

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Over the past decade, the central banks of the United States, the Eurozone, and Japan have implemented policies of quantitative easing (QE). It is important to understand why these central banks did so, and what the merits and shortcomings of QE are.

QE can be viewed as a measure of last resort. When the aim of monetary policy is to stimulate economic activity—or at least prevent the deepening of a recession—and nominal interest rates are close to zero, the traditional interest rate tools of the central bank are not very effective to achieve that aim. QE is the purchase of large quantities of assets by the central bank, paid for with newly created base money (cash plus bank reserves).<sup>1</sup> The purpose of QE is to boost aggregate spending.

QE policies were implemented in the United States in the aftermath of the 2008 financial crisis, a period dubbed the Great Recession. At that time, many pundits wrongly predicted that these policies would lead to much higher inflation.<sup>2</sup> Their mistake was confusing one type of QE, inflationary QE, which has infamously plunged many countries into extremely high inflation, and the other type, defensive QE, which is generally not highly inflationary.

With the first type of QE, when nominal interest rates are positive and the central bank does not pay any interest on bank reserves, large purchases of assets amount to large injections of cash into the economy.<sup>3</sup> Under these conditions, the public tries to get rid of these excess cash balances as quickly as if they were holding a hot potato. The act of spending excess cash balances pushes up aggregate demand. In some cases, the expanding demand will far outrun the growth in production, pushing inflation sharply higher. In fact, this sort of QE has historically led to hyperinflation. Germany in the early 1920s, and Zimbabwe and Venezuela in more recent years are good examples of what I call “inflationary QE.”

The second type is what I call “defensive QE.” When nominal interest rates are close to zero, base money and safe assets such as Treasury bills can become very close substitutes. Under these conditions, banks are willing to hold large quantities of excess reserves, beyond the reserve requirement. Because the “hot potato effect” is no longer operative, these monetary injections typically do not lead to dramatically higher inflation.

Because there is almost no opportunity cost of holding cash or bank reserves at zero interest rates, the demand for base money as a fraction of GDP rises sharply. Thus, in the United States, the demand for base money during the Great Recession rose to as much as 23 percent of GDP,<sup>4</sup> far higher than before rates hit zero—and in a few countries, such as Switzerland and Japan, the demand soared to levels closer to 100 percent of GDP. This is the fundamental problem that pushed so many countries to adopt QE policies as a defensive measure once interest rates hit zero. These money injections were accommodating the increased demand for highly liquid assets such as cash and bank reserves that resulted from near-zero interest rates.<sup>5</sup>

Even though defensive QE programs have a mild expansionary impact, at the margin they should not be viewed as highly expansionary monetary policies. For example, as the Eurozone emerged from the Great Recession, inflation briefly rose in 2011 above the 2 percent target of the European Central Bank (ECB). The ECB responded with several increases in their target interest rate, aimed at slowing the inflation. Unfortunately, this contractionary monetary policy drove the Eurozone into a double-dip recession. As a result, over the next few years, Eurozone interest rates steadily declined, and by 2014 the ECB was forced to push interest rates into negative territory to try to stimulate the economy. In 2015, it also adopted a policy of QE, as further declines in interest rates were impractical. What looked to most outside observers like a highly expansionary monetary policy in the Eurozone (low rates and QE) was actually a *delayed defensive response* to the contractionary monetary policy of 2011.<sup>6</sup>

As a general rule, countries with larger monetary bases as a share of GDP tend to have more contractionary monetary policies and lower inflation rates. Conversely, countries that adopt inflationary QE programs, such as Venezuela or Zimbabwe, tend to have a low level of base money as a share of GDP.

Many people have the same misconceptions about QE as they have about nominal interest rates. On any given day, a decision by the Federal Reserve (Fed) to raise interest rates is a contractionary monetary policy. But over a longer period of time, steadily rising interest rates are often reflective of an earlier expansionary monetary policy, which pushed inflation and nominal interest rates up to much higher levels. This is called the “Fisher effect” and is the standard explanation for the rising interest rates during the 1960s and 1970s. Conversely, when a contractionary monetary policy pushes an economy into deflation, depression, or both, interest rates may initially increase but will eventually fall to much lower levels, as occurred in 1929–33.

Therefore, QE is not necessarily highly inflationary for the same reason that low interest rates are not necessarily expansionary—both may be reactions to previous contractionary policies. A policy of QE that would be inflationary during normal times, when interest rates are positive, no longer leads to high inflation when a previous contractionary policy has pushed nominal interest rates down to zero.

### THREE POLICY OPTIONS

If the monetary policy regime is such that interest rates frequently fall to zero, then the two options immediately available are either to engage in massive QE to boost the economy, or to passively allow the economy to fall into a deep recession. I would argue that neither of those two options is particularly attractive, although a severe recession is clearly worse.<sup>7</sup> But even QE has drawbacks: central banks find it more difficult to hit their inflation targets when relying on policies of QE than when using more traditional policy tools. This is because the impact of QE depends on whether the injections of newly created money are perceived as temporary or permanent, and central banks have difficulty communicating this information to the public.<sup>8</sup>

A better alternative is to adopt a policy that avoids the need for QE. Central banks can adopt a policy regime that has the effect of keeping expected inflation and nominal GDP growth at a high enough level to prevent interest rates from falling to zero. Indeed, that was essentially the policy in the United States from the Korean War up until 2008. Going forward, one option would be to raise the inflation target from 2 percent to, say, 3 or 4 percent. Higher inflation expectations lead to higher nominal interest rates, providing more room to cut interest rates during a recession. QE is not needed as long as nominal interest rates remain above zero.

However, in my view this is not the best option, as high inflation also imposes costs on the economy, such as discouraging saving and investment.

An even better alternative might be to keep inflation close to 2 percent, but switch to level targeting of prices or of nominal GDP (NGDP). The term “level targeting” means that the central bank would spell out an explicit target path for its policy goal variable (prices or NGDP), and then promise to come back to the target path over time whenever the economy temporarily deviated from the policy goal. Research by Michael Woodford suggests that this is one way of keeping monetary policy effective, even at zero interest rates.<sup>9</sup> Thus if the policy goal is 2 percent inflation, then when inflation temporarily falls to less than 2 percent, a policy of level targeting would call for slightly more than 2 percent inflation going forward. Conversely, when inflation temporarily rises to greater than 2 percent, level targeting would call for slightly less than 2 percent inflation going forward, until the economy had returned to the target path for the price level (which rises at 2 percent per year). Woodford also suggests that level targeting of nominal GDP growth around a 4 percent trend line might be even more effective at overcoming the problem of zero interest rates.

To summarize, there are actually three options facing modern central banks, not two:

1. Set an inflation target (or a nominal GDP growth target) at a high enough level to keep equilibrium interest rates well above zero. In that case, no QE is needed.
2. Adopt a policy of defensive QE once interest rates fall to zero in order to keep inflation from falling far below the 2 percent target.
3. Refrain from doing QE, even when interest rates have fallen to zero, allowing inflation to fall well short of the central bank target and risking a deep recession.

In my view, option 3 is clearly inferior to the first two options, and indeed the difference between options 2 and 3 largely explains why the US did much better than the Eurozone during the Great Recession. Early on, the Fed was more aggressive in using unconventional tools such as QE, while the more conservative ECB remained much more passive until the double-dip recession of 2011–13 caused such financial distress that the ECB was virtually forced to adopt policies that it had previously disdained, including QE.

The best way to prevent QE is to have a regime that precludes its necessity. Any need for QE would suggest that the central bank has already failed to generate adequate growth in nominal spending and that the economy is falling well short of the central bank's objectives. While some research suggests that QE is effective at boosting spending and prices, most observers believe the effects have been quite modest, and central banks adopting QE have generally fallen short of their inflation targets.<sup>10</sup>

## **INTEREST ON RESERVES AND UNCONVENTIONAL ASSET PURCHASES**

There are two additional real-world complications to the implementation of QE. One factor is the increasingly popular central bank practice of paying interest on bank reserves (IOR). A second issue is the question of which assets are to be purchased. Should the central bank confine its asset purchases to safe assets such as Treasury bonds, or they should engage in the purchase of riskier assets?

In October 2008, the Fed began paying IOR for the first time in its history. The effect of this policy was an increase in the demand for bank reserves, and hence the overall demand for base money. Prior to 2008, the monetary base was more than 90 percent composed of currency held by the public.<sup>11</sup> The various QE programs, combined with the adoption of IOR, caused bank reserves to soar dramatically higher. Today, bank reserves comprise slightly more than 60 percent of the monetary base.<sup>12</sup> As with any policy that boosts the demand for base money, paying IOR is a contractionary monetary policy.

The problem here is that a contractionary policy was not needed when IOR was adopted, and hence the subsequent QE policies were, in part, a defensive measure to offset the contractionary

impact of paying IOR. In other words, when the economy is depressed, a policy of IOR creates a sort of artificial problem of increased demand for bank reserves. And a higher demand for bank reserves is contractionary. The central bank then uses QE (an expansionary policy) to accommodate this increased demand for reserves. However, owing to the payment of IOR the overall policy stance may remain contractionary, despite the implementation of QE.

A better option might be to not pay any IOR (or even pay a negative rate of IOR), which would allow the central bank to hit its policy objectives while engaging in a much smaller amount of QE. Without the payment of IOR, the demand for base money will be lower. In that case, any given monetary injection will be more expansionary than when IOR is positive. If there are concerns about the size of the central bank's balance sheet, paying a positive IOR makes the problem even worse.

The second complication has to do with the types of assets that are purchased by the central bank. In general, the least controversial types of QE involve the purchase of safe assets such as Treasury securities. Because Fed holdings of Treasury securities are both liabilities of the Treasury and equivalent assets for the Federal Reserve, the decision by the Fed to purchase T-bonds, for example, does not add any net risk to the consolidated government balance sheet. However, long-term Treasury securities can be risky for the Fed, considered in isolation. If long-term interest rates were to rise quickly, the market value of the Fed's holdings of T-bonds would fall just as fast. In an extreme (albeit unlikely) case the Fed might become insolvent, requiring a bailout from the Treasury.

Again, this is *not* a risk borne by the government as a whole, because any capital losses accruing to the central bank are exactly offset by capital gains accruing to the Treasury, for which T-bonds are a liability.<sup>13</sup> Nonetheless, officials at the Fed may have had a nagging fear of ending up in an embarrassing situation where the fiercely independent central bank needed to be bailed out by the Treasury. This fear inhibited Fed T-bond purchases during the Great Recession and partly explains why the Fed fell short of its inflation target despite the three QE programs.<sup>14</sup>

During the three rounds of QE, Fed purchases were generally confined to safe assets such as T-bonds or the sort of mortgage-backed securities that have been at least de facto guaranteed by the Treasury. Other central banks have occasionally taken greater risks. Indeed, the Bank of Japan has purchased substantial quantities of equities. This reflects the fact that nominal interest rates are even lower in Japan than in the United States and the fact that the demand for base money is dramatically higher there. At some point, a central bank wishing to do QE may run out of safe assets to purchase and be forced to engage in the purchase of riskier assets such as corporate bonds, equities, or both.

## **QE IS THE SYMPTOM; WE NEED TO FOCUS ON THE POLICY REGIME**

The preceding analysis does not mean that we should look to QE as an unalloyed good. Many analysts are apprehensive of massive central bank asset purchases. This apprehension partly reflects confusion between the sort of QE that leads to hyperinflation and defensive QE, which has recently occurred in developed economies. But it also reflects concerns that central banks will increasingly move into areas that are better left to the private sector, such as credit allocation. The concern is not just with *how much* central banks purchase, but also with *what* they buy. Indeed, one common criticism of QE is that it bleeds over into “credit allocation,” as the purchases of mortgage-backed securities could be seen as a way of directing credit to the mortgage loan market.

A monetary policy regime that keeps nominal interest rates from falling to zero in the first place does not need QE. Australia’s monetary policy, for instance, kept interest rates above zero throughout the Great Recession and therefore did not need to use QE to prevent deflation. The lesson is that it is better to have a monetary policy regime that maintains a high enough inflation rate, NGDP growth rate, or both to keep interest rates well above zero. Although people think of QE as an expansionary monetary policy, it’s often a defensive policy that is needed because *previous monetary policy was too contractionary* to keep interest rates from falling to zero.

People who ask whether QE is a good policy are posing the wrong question. Debates about QE need to back up one step and ask why our monetary policy regime got us into a position where QE was deemed necessary in the first place, and then ask whether there are alternative policy regimes that would not require such extreme measures. In my view, eliminating IOR and setting a level targeting policy of 4 percent NGDP growth would largely eliminate the need for QE. But if we do not do those things, then QE may be better than the alternative: a deep recession and deflation.

## **ABOUT THE AUTHOR**

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## NOTES

1. Base money (aka the “monetary base”) includes bank reserves and cash held by the public. The Fed generally creates base money by purchasing financial assets with newly created money. The Fed purchased large quantities of Treasury securities and also mortgaged backed securities.
2. A letter published in the WSJ in 2010, signed by 23 economists, investors and pundits, warned that QE risked “currency debasement and inflation.” See “Open Letter to Ben Bernanke,” *Wall Street Journal*, November 15, 2015.
3. Nominal interest rates are the actual market interest rate, reflecting a real return plus inflation compensation. During periods of high inflation, nominal interest rates are typically very high.
4. Federal Reserve Bank of St. Louis, “Monetary Base; Total,” accessed February 14, 2018, <https://fred.stlouisfed.org/series/BOGMBASE>; Federal Reserve Bank of St. Louis, “Gross Domestic Product,” accessed February 14, 2018, <https://fred.stlouisfed.org/series/GDP>.
5. In the United States, the payment of IOR also contributed to the increased demand for base money.
6. Scott Sumner, “Monetary Policy Rules in Light of the Great Recession,” *Journal of Macroeconomics* 54, PA (2017): 90–99.
7. Scott Sumner, *The Midas Paradox: Financial Markets, Government Policy Shocks, and the Great Depression* (Oakland, CA: Independent Institute, 2015).
8. David Beckworth, “Permanent versus Temporary Monetary Base Injections: Implications for Past and Future Fed Policy,” *Journal of Macroeconomics* 54, PA (2017): 110–26.
9. Michael Woodford, “Methods of Policy Accommodation at the Interest-Rate Lower Bound,” in *The Changing Policy Landscape: 2012 Jackson Hole Symposium* (Jackson Hole, WY: Federal Reserve Bank of Kansas City, 2012).
10. Joseph Gagnon found that QE did have an expansionary impact. See Joseph E. Gagnon, “Quantitative Easing: An Underappreciated Success” (Policy Brief No. 16-4, Peterson Institute for International Economics, Washington, DC, April 2016). David Greenlaw and his coauthors were more skeptical. See David Greenlaw et al., “A Skeptical View of the Impact of the Fed’s Balance Sheet” (working paper, February 2018). Paul Krugman and David Beckworth argued that temporary monetary injections are particularly ineffective at boosting spending and prices. See Kathryn M. Dominguez, Kenneth S. Rogoff, and Paul Krugman, “It’s Baaack: Japan’s Slump and the Return of the Liquidity Trap” (Brookings Papers on Economic Activity No. 2, Brookings Institution, Washington, DC, 1998); Beckworth, *Permanent versus Temporary Monetary Base Injections*.
11. Author’s calculations based on Federal Reserve Bank of St. Louis, “Monetary Base; Total”; Federal Reserve Bank of St. Louis, “Currency Component of M1,” accessed February 14, 2018, <https://fred.stlouisfed.org/series/CURRENCY>.
12. Author’s calculations based on Federal Reserve Bank of St. Louis, “Monetary Base; Total”; Federal Reserve Bank of St. Louis, “Total Reserves of Depository Institutions,” accessed February 14, 2018, <https://fred.stlouisfed.org/series/TOTRESNS>.
13. Ben S. Bernanke “Some Thoughts on Monetary Policy in Japan” (remarks, Japan Society of Monetary Economics, Tokyo, May 31, 2003).
14. Joseph E. Gagnon, “Is That All There Is? The Remarkably Small Costs of Quantitative Easing,” *Realtime Economic Issues Watch*, Peterson Institute for International Economics, September 5, 2012.