Summary: Unconventional monetary policy through quantitative easing [QE] has much more in common with than difference from, normal monetary policy. Once past overt financial crisis, QE affects the economy through largely the same channels and has the same limitations as interest rate setting. Exit from QE measures is not a problem, if the assets purchased were government securities. The direct impact of QE on exchange rates and global oil prices is small. The use of QE and the downward pressure on the US dollar are both the result of a common factor: the financial crisis accelerating the decline of the US economy’s relative macroeconomic stability.

The term ‘unconventional monetary policy’ is misleading, because it exaggerates the difference from ‘conventional monetary policy’ in normal times. This misunderstanding is probably due to a combination of poor communication by central banks and the crisis circumstances when it was undertaken. It is worth noting the difference in circumstances under which Quantitative Easing [QE] measures were begun by the US Federal Open Market Committee [FOMC] and the Bank of England’s...
Monetary Policy Committee [MPC] in late 2008-early 2009, and those when then programs were extended later in 2009, or when another round was undertaken since Autumn 2011. In Autumn 2008, credit markets were locking up to a degree that was completely unexpected, even by those who forecast a recession or crash, with asset prices across almost the entire range of investments and countries moving downwards together. Interest rates were cut aggressively, but the severity of the shock limited the positive impact in two ways: first, central banks would have cut rates more than they did, had they been able to do so without running out of room at (near) zero; second, the impact of cuts on the real economy was greatly diminished because of the panic and dysfunction in the financial system.

Central banks understandably threw whatever it was they had at the problem, which included guarantees to various intermediaries and on specific kinds of transactions, expanding facilities to provide liquidity and to discount a wider range of assets for a wider range of counterparties than normal, and creating central bank reserves to purchase assets in the secondary markets. This last category includes both government bonds and private-sector debt instruments. The goal of all these measures was ultimately to turn around the economy and prevent disaster – which along with other actions by governments they have managed to do. But the proximate target was to restore normalcy to credit markets. So central banks pursued policies to provide a secure counterparty, reduce uncertainty, and provide sufficient liquidity for transactions to go through. They made markets where markets were collapsing.
Compare those circumstances to the ones surrounding unconventional measures from mid-2009 onwards. While risk aversion remained high, and the rate of interest needed to get to full employment remained low, the economy was functioning and recovering. These operations were attempts to expand the broad money supply, especially since the velocity of money was declining and unpredictable during the crisis, so any resulting expansion of credit growth was welcome. They were close to normal policy setting exercises, where an interest-rate setting rule told central banks by how much more they should have cut rates below zero, and the amount of reserve creation or asset price purchases was calibrated to be a rough equivalent. Unlike the initial unconventional measures, which were first attempts to get ahead of mounting credit market breakdowns with aggressive direct interventions, the bulk of QE was focused on convincing investors to move back into riskier asset classes, thereby reflating the economy.

Normal monetary policy by interest rate setting is like getting on a scheduled four hour train trip to a rural destination: one knows how long it will take to get to there; the ride is smooth, well-marked and scenery is to be enjoyed; any particular causes of delays announced and often anticipated. Unconventional monetary policy is like making the same trip to the countryside but: doing so in an urgent hurry; driving a 10 year old used car with a cranky transmission; down a rural road because the railroad track is closed; without much signage, and with all kinds of strange surprises blocking traffic. You will get where you are going using these measures, but you are unsure how long it will take to get there, and you will not enjoy the ride. (Posen (2009))
In other words, we can be confident that unconventional monetary policies’ effect on nominal income is positive, and therefore that our economies would have been stuck in a far worse place had these measures not been implemented. We cannot pretend, however, to have precise knowledge of the size or timing of these measures’ impact. If anything, despite the large sums involved, the measures’ impact was difficult to discern and not overwhelming. One does not get to the destination faster on an unmarked unfamiliar back road in a beat up car, than one does with scheduled rail service.

The Channels of Monetary Policy Limit Inflation Risk

To a first approximation, the primary way that all monetary policy affects the macroeconomy is via its effect on aggregate demand. This occurs primarily through relative asset prices and the availability of credit, but also via the exchange rate and liquidity needs. There is a channel by which it directly influences expectations about inflation and other variables, but this effect is smaller than the effect via aggregate demand and cannot take effect instantaneously, given sticky prices and wages. Note that this applies to all forms of monetary policy, not just QE. One key distinction about QE, however, is that it is operating through quantities rather than prices. As a result, the ‘setting’ of monetary policy, the degree of monetary accommodation, is best captured by the size of the central bank’s balance sheet relative to GDP rather than by either the flow of QE or the interest rate the bank has set (adding on to the latter). At present, the three major western central banks (BoE, ECB, and Fed) all have balance sheets in the 27-32%
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of GDP range - though the ECB only came up to that size at the end of 2011, after lagging the other two central banks in activism. (Pisani-Ferry and Posen (2011)

Given this reality-based understanding, the prognostications that talk about high inflation threats from the recent large-scale creation of bank reserves are rather dubious. If one believes in a kind of mechanistic monetarism, then how much money growth has exceeded the amount required to accommodate the development of the economy supposedly matters, irrespective of the surrounding deflationary circumstances. Even the Bundesbank, and more sophisticated monetarist in the spirit of Milton Friedman, acknowledge that MV=PQ, meaning changes in economic activity and in the structure of the economy (the V for velocity) affect the impact of monetary growth. That is why, when looking back at the last forty years in the G7 countries, the only periods where excessive monetary growth led to sustained rises in inflation were during the early and mid-1970s. As we all know, there was a lot more going wrong with macroeconomic policy in those times, and many more upwards pressures on wages prices then, than we have today.

In other instances since then, excessive monetary growth (benchmarked to trend) was not followed by high inflation, and sometimes was even followed by inflation declines. See figures 1a-d, which show the long-run scatterplots and limited correlations of monetary growth with inflation (some of which are negative; the fit is worse for narrow money or different lags). Note that this statement includes instances of excessive monetary growth during the last decade for France, Germany, Italy, and the US, so the
absence of connection between monetary growth and inflation is not an artifact of there having been no high monetary growth instances in recent years. Most similarly, the Bank of Japan officially began what it termed Quantitative Easing in March 2001, buying huge numbers of Japanese government bonds and creating reserves in the banking system. The resultant spike in narrow money growth did not result in an increase in broad money or credit growth, let alone an increase in the price level (see Figure 1d).

For academic research, this points towards theories where money is endogenous. For practical policymaking, the point is that there is no evidence from relevant periods of economic history that the unconventional measures taken will result in high or sustained inflation. The exit from these measures will require operational skill, especially for central banks which have a lot of private sector assets on their balance sheets to sell back\(^2\) - but the macroeconomic impact of such exit, if any, will be in a disinflationary direction by driving down asset prices and driving up interest rates as the economy recovers. The unconventional monetary policy measures have indeed served the pursuit of price stability as intended, although with more uncertainty about their size of impact than central banks would prefer.

**The Effectiveness of QE**

\(^2\) The ECB’s Long-term Repo Operations (LTROs) on many assets that are not government bonds or government guaranteed, with a fixed three-year limit on holding them, presents a more difficult challenge than either the Fed’s holdings of Treasuries and Agencies or the BoE’s holdings of gilts.
Another widely voiced but opposite concern about QE is the claim that our previous “unconventional” efforts to stimulate the economy either were not terribly effective or are unlikely to be effective if extended today. This is another false belief. It is as though the fact that the British economy (or the American, for that matter) is not fully recovered after our previous rounds of QE is evidence that QE failed to work. Even on the face of it, that is a strange type of logic. We know that infusions of QE to the economy have been closely associated with large falls in interest rates out the yield curve of comparable size in the UK and the US. We know that the relative price of riskier assets has gone up, indicating greater demand for them, when QE has been undertaken. And we know that banks have received increased deposits and investors and households have expressed increased confidence in the wake of each round of additional QE, in both the UK and the US. In any understanding of how the economy works, this has a stimulative impact, just as a cut in Bank Rate does through the very same channels. One way of thinking about this is to look again at the decline in the velocity of money since the crisis (see figure 2a)

While it fell significantly in all three western monetary zones, reflecting the banking problems and liquidity preference, it has stopped falling well above zero, and begun to recover. In Japan (see figure 2b), velocity kept falling over an extended period due to failure to confront financial reform

Again, let’s return to common sense and our personal experience. You (or probably better, you and me both) might be taking medicines right now to reduce your blood pressure and your cholesterol levels. A huge body of scientific research as well as basic chemical logic tells us that these prescription

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3 For assessments of the impact of the Bank of England’s QE program, see Bean (2009), Dale (2010), and Joyce, et al, 2010). For assessments of the impact of the Federal Reserve’s QEI and QEII, see Gagnon, et al (2010), and Yellen (2011). On prior QE experience in Japan, see Bowman, et al (2011) and Posen (2010a). All support this picture.

4 Strong statements in support of the effectiveness of QE can be found in BoE Governor King’s answer to Question 14 from the November 2010 Treasury Select Committee in Transcript (“I have as much confidence in the impact of asset purchases as I do in interest rate changes.”).
medicines do reduce the intermediate targets of cholesterol and blood pressure. A huge body of scientific research establishes as well that high blood pressure and cholesterol are associated with a higher risk of heart disease and stroke (god forbid). Millions of people like you and me take these medicines as a result, serious side effects are rare and can be easily discerned, and we can see readings of our BP and cholesterol decline. As a result, our doctors and even our public health officials recommend they be widely prescribed. Yet, it is difficult to prove directly that taking these medicines prevent heart disease and stroke, given how many other factors are involved in those outcomes. Only after a lot of time passes and a lot of cases are seen has the statistical association between some of these medications and the ultimate health goals been established. And even then, it is no guarantee that any individual taking these medicines will not develop heart disease. But still we should take them and our doctors should prescribe them if we have the unfortunately right indications.

This is the same situation we are in with QE. We know it has a discernible significant effect on things like credit conditions, confidence, relative asset prices, and liquidity, as well as bank lending, in the expected and desired direction. We know that moving credit conditions, et al, in the expected and desired direction has a significant effect on macroeconomic outcomes in the desired direction, all else equal. We cannot on the basis of a handful of instances of QE programs in total estimate definitively the size of the impact that our programs to date have had on our economies – in part because these economies are busy having financial arteriosclerosis and rising blood pressure for a bunch of other reasons at the same time (that is why the QE was prescribed in the first place, after all). Evaluations of the fiscal stimulus program in the US at the start of the Obama administration have faced the same misperception for parallel reasons, and policymakers just have to do more of what is right in either case and get over being unappreciated.

Given the measurable impact that QE had on all these various channels of the economy – which by the way is no different than tracking the impact of a move in Bank Rate, which also works through all...
these various channels of the economy – it seems reasonable to think that GDP was at least 1.5% higher and inflation at least 0.5% higher in the UK in Summer 2000 than it would have been in the absence of QE.\(^5\) The cumulative impact of the additional £125 billion in Gilts purchased since October 2011 should be expected to be an additional 0.7% of GDP and 0.3% on inflation. One can make similar estimates for the US, but the calibration mapping amounts of QE into estimated macro effect would differ.

The state of the banking system of course does matter to QE. That particular channel of transmission from QE – or from a cut in Bank Rate, were we not effectively at the Zero Lower Bound, for that matter - is impeded at present, for all of the well-known reasons. But as argued in Bean (2009), Dale (2010), and Fisher (2010), part of the point of QE was to go around the damaged banking system, and it still works to do so. True, the level of longer-term interest rates is lower than it was when we started QE in 2009, and the yield curve is flatter. Yet, there is still room to bring down the longer end of the yield curve, and, as interest rates get lower, smaller moves in them will produce larger shifts in the prices of risky assets. QE also has a bigger impact via the confidence and liquidity channels when there is panic in financial markets and the substitutability between gilts and other types of financial assets decreases.\(^6\) That would presumably be lower than in early 2009, although recent developments in financial markets suggest that these potential effects of QE are becoming larger again, especially as a function of any given banking system’s connection to the euro area.

It is possible that further QE will be insufficient on its own to create a sustained recovery because of widespread risk aversion and liquidity preference killing investment demand (as in Krugman (1998), Eggertson and Krugman (2011), Posen (2010c)). If that situation becomes evident, then that is the time...
for further fiscal stimulus, and monetary policy can support such measures.\(^7\) Obviously, the room for fiscal stimulus is subject to limitations from the conditions of debt sustainability and market credibility that any given government faces. As a general proposition, I will just note that, if QE is less than effective due to persistent excessive liquidity preference and deflationary expectations, economic theory says that money financed fiscal stimulus is the right response. The indicator of such a situation is persistently low and declining government bond interest rates. In practice, it was when fiscal and monetary stimulus worked together in conjunction with a banking clean-up that Japan did grow in the 2000s, and emerged from its Great Recession (Posen (2010a)). Let us hope we do not face that dire situation of mounting risk aversion, and I do not think it very likely, given the QE undertaken to date.

**Operational Aspects of QE**

As argued in Bean, et al (2010) and Bernanke (2010), uncomfortable though some might be with utilizing the unconventional monetary policy measures undertaken over the last two years, there is no real economic or technical impediment to undertaking more of them in the present circumstance. Bernanke (2000, 2011), Kuttner (2009), Nishimura (2009) and Posen (2011) discuss from a practitioners’ perspective some of the various policy options available currently available to central banks.

The persistence of deflation in Japan, despite the Bank of Japan’s own LSAPs of Japanese government bonds from 2003-2006, remains a cautionary tale that QE – like any monetary policy – has to constitute a credible commitment.\(^8\) A Japanese economist friend teased me in 2009 that once I got inside a central bank, I then realized how difficult it was to get the desired effects from QE, so I toned down my rhetoric. That turned out not to be true, as my votes in 2010 and 2011 demonstrated.

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\(^7\) Blanchard, Dell’Ariccia, and Mauro (2010) and Posen (1998) discuss the effectiveness and viability of fiscal stimulus under such circumstances.

indeed been less loudly critical of the Bank of Japan’s now past actions, but, as I told my friend, my rhetorical switch came in 2004 when it became apparent that the Bank of Japan was trying LSAPs, and reflation was not arriving as easily as I had and others had presumed it would.

Subsequent research suggests that part of the problem was that the Bank of Japan waited too long to begin LSAPs, so that deflationary expectations were already entrenched. The Bank of England and other central banks took a lesson from that, citing the example to motivate their rapid reactions in 2008-09. The BoJ leadership also engaged in rhetoric until the time of Governor Fukui in 2003 that undercut any expectations impact from QE, and reverted back to type in 2006 forward. Another source of the difficulty the Bank of Japan had with getting maximum effect on prices from its QE program was that the Bank actually bought short maturity bonds, which are close substitutes for cash and thus would be expected to have only a limited effect on portfolio behavior. (McCauley and Ueda (2009); Kuttner (2009)).

The Japanese experience raises a legitimate issue whether the only assets to be purchased by central banks should be (medium- to long-maturity) government bonds, or whether other private assets (such as corporate bonds, commercial paper, or high quality mortgages) might be purchased in quantity by central banks as well. My feeling has always been that while purchasing private assets has some risks, notably in terms of public holdings overhanging market prices, and of difficulty in exiting the position in a given asset market when monetary contraction becomes desirable, these risks are manageable or at least much smaller than the macroeconomic risks of inaction. In fact, my instinct,

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10 There are all kinds of other ill-founded concerns raised about the expansion and eroding quality of central bank balance sheets, irrespective of the type of asset purchased, just as were mooted in Japan in the 1990s. As I argued in Posen (1999, 2000), these proved to be unfounded when QE was undertaken on a large scale by the Bank of Japan in 2003-06, and so far in the UK or US. Since these are just the shibboleths that lead to ‘self-induced paralysis’ by
and I believe that I am not alone in this view, is that purchasing private assets should have a larger macroeconomic impact than purchasing government bonds, *ceteris paribus*, because then one is going after risk spreads, as well as liquidity issues or term-premia, and potentially unblocking a distressed market (Nishimura (2009), Posen (2009)). Further, to the degree one believes in the ‘preferred habitat’ view as a source of QE’s effectiveness, purchasing assets that are less perfectly substitutable for cash than government bonds would seem to be the way to go to maximize bang for the buck (especially in a liquidity trap).  

Reassuringly, however, the best empirical studies to date of the impact of QE in the UK (Joyce, et al, (2010)) and of the impact of ‘credit easing’ in the US (Gagnon, et al (2010)) estimate that the immediate impact on interest rate spreads of LSAPs are comparable whether done with public or private asset purchases. Moreover, the feasibility of the private assets purchase approach depends upon the availability of different types of assets and relative depth of markets in a given economy, as I discussed in Posen (2009). In the UK, perhaps surprisingly, we have very limited depth and breadth in our markets for corporate bonds and mortgage backed securities, and large scale purchases by the central bank would essentially overtake the whole market. A central bank should not want to have a monopsony position as a sole buyer of all of an asset class, or to make choices about specific private-sector assets’ relative worth, if it can possibly avoid doing so.

A related interesting issue is raised by the US experience at present. The Federal Reserve has ceased to expand its balance sheet, perhaps due to political concerns. Instead, the FOMC has emphasized forward looking commitments not to raise interest rates until a set date is met or a macro

central bankers (in Bernanke’s (2000) apt phrase), and I already have refuted these in Posen (1999, 2000, 2009, 2010b) and elsewhere, I will skip recapping those misleading arguments here.

11 I am grateful to Ken Kuttner for discussion of this idea, as part of our research work in progress.  

12 Neely (2010) presents some evidence that LSAPs by the Federal Reserve also had large international effects. The overseas spillovers of unconventional monetary policy measures merit further analysis.
target is achieved. The Fed also engaged in an extensive version of ‘Operation Twist” trying to drive down the long end of the Treasuries yield-curve versus the short end. These seem to have had the desired effect on interest rates. The theory that one can achieve all of monetary policy at the Zero-Lower Bound through pre-committing to keep rates lower for longer is well established (Eggertson and Woodford (2002), Okina and Shiratsuka (2004)) It is an interesting question, however, whether such a commitment would have been believed absent the prior purchases of Treasuries expanding the Fed’s balance sheet, and thus the credible threat of further expansion being real. On the other hand, perhaps the MPC did not need to purchase quite so many additional gilts, if a pre-commitment were enough. Still, there has to be some cost to pre-committing on interest rates, especially if one pre-commits with regard to timing instead of with respect to target variables.

**International Spillovers from QE -**

Occasionally one hears that LSAPs by central banks is a form of competitive depreciation of exchange rates, nothing more. If QE were such a ploy, however, I and other monetary policymakers would not have been encouraging our counterparts at other central banks to undertake simultaneous if not coordinated monetary stimulus— which of course is precisely what we have done both on the record (e.g., Posen (2010b) and related New York Times articles) and in international meetings of policymakers.

Consider the graph of the Bank’s Sterling Effective Exchange Rate over time presented in Figure 3a. In March 2009, the Bank of England began quantitative easing, with the Index at 75.2. Approximately six weeks before QE was announced, the pound had stopped falling (the index hit a local low of 70.4 in January 2009 from a relative high of 102.4 at the start of January 2007). While this may be mere coincidence, the claim that the Bank (or MPC) intended to depreciate competitively is demonstrably false. After QE began, the pound moved sideways until the euro crisis, and overall is flat between the announcement of our Asset Purchase Program and the suspension of asset purchases in February 2010.
(77.2 versus 75.2 on the announcement dates). Our restarting QE in October 2011 had no discernable impact on the exchange rate beyond day-to-day noise.

A similar lack of pattern can be seen in the US experience (figure 3b). In Japan’s QE period as well (figure 3c), the yen appreciated very strongly, even in the face of direct currency market intervention to sell dollars by the Japanese government on a huge scale in 2003 and early 2004, supplementing LSAPs. One can contemplate trying to uncover more of a link between QE and exchange rates, using more variables or fancier econometric techniques, but no such robust relationship exists. Exchange rates remain a random walk, absent direct exchange rate intervention combined with capital controls by governments (in which case, QE is no longer an option to set on its own). If anything, the direct relationship looks even weaker because of course QE is undertaken in response to data which pushes the growth and inflation forecast for a given economy down, so controlling for the impact of that expectation on exchange rates, there is even less to attribute to QE independently.

More legitimately concerning, however, is the question of whether QE in the anchor economy (the US) affects prices in commodity markets, especially when those commodities are priced in that anchor currency. If one of the main impacts of QE is to encourage investors at the margin to shift out of cash and treasuries into other assets, then there may be some upwards pressure on commodity prices from QE in the US. The empirical question, however, is how large an effect is that, beyond whatever impact on those prices from QE’s contribution to US (and thus to global) recovery in aggregate demand. Given that commodities futures markets do not seem to have an exploitable link to QE, we tried to investigate this directly.

We ran a series of regressions of the monthly commodity price index (broad, in dollars) and oil price (in dollars) on world gdp growth and US narrow money growth, as well as alternative measures of the change in FOMC balance sheet size. We data-mined to pick appropriate lags, included one or two lags of the dependent variable if significant, and estimated for periods of both 2000-present and
2008-present, and then chose the lag of US narrow money growth or Fed balance sheet size which maximized the t-statistic on that variable. This was all in order to give the best possible change for a significant result that monetary ease by US matters for commodity prices beyond its impact on US or world growth. It turns out that for the post 2000 sample, the coefficient on US narrow money/FED balance sheet is statistically significant (and positive) at the 5% level and in most cases even at the 1% level, for both oil prices and commodities. For the post-2008 sample, the coefficient on the FED balance sheet is significant for both oil and commodity prices, but that on US narrow money is not.

Figure 4 below shows the annual oil price growth and the contributions of the explanatory variables when the US narrow money growth is used as a measure of monetary ease for 2000-present (our representative case). The difference between statistical significance and economic significance is clear. As can be seen, the model does not do a great job overall of explaining the variation in oil price movements, and the contribution of US narrow money, though statistically significant, is economically quite small. Similar results obtain for all of our remaining regressions. A more complete model would include supply factors as well as demand. While such factors might improve overall fit, there is little reason to expect monetary policy would have an impact on oil supply, and hence little reason to think that omission of supply determinants biases downward the coefficient on monetary policy.

Conclusion -

Markets and the public should maintain some perspective on the ‘unconventionality’ of our current monetary policy measures, especially given the magnitude of the shocks to which our economies have been subjected. I think both the Bank of England and the Federal Reserve gained an exaggerated confidence over the Great Moderation of 1992-2007 about just how finely central banks could both forecast and control inflation. We can still control inflation over the medium-term, but the degree of extreme predictability seen then was due not just to the good policy regime, but was also partly due to
good luck in terms of the absence of major shocks, and thus was misleading. Monetary policy, whether by interest rates or asset purchases, is useful within limits. QE undertaken by the Fed is a response to the financial crisis accelerating US relative economic decline, just as the desire to move out of dollars is a response to that fact – QE did not cause that fact. If a house is on fire, both the firemen pumping water and people escaping are responses to the fire. The water pumping does not cause the evacuation.
References


Figures

Figure 1a Broad Money and Inflation UK

![Figure 1a Broad Money and Inflation UK](image)

Figure 1b Broad Money and Inflation US

![Figure 1b Broad Money and Inflation US](image)
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Figure 1c Broad Money and Inflation Euro Area

![Euro Area diagram](image)

Figure 1d Broad Money and Inflation Japan

![Japan diagram](image)
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Figure 2a Velocity of Money in today’s crisis areas

Figure 2b Velocity of Money in Japan

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Figure 3a Sterling ERI (Shaded periods are of MPC’s QE operations)

Figure 3b -Dollar ERI (Shaded periods are of FOMC’s QE operations)
Figure 3c Yen ERI (Shade period is of BOJ’s QE operation)

Figure 4 A simple decomposition of oil price movements