Unconventional Monetary Policy
Hitting their goals or missing the mark?

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EXECUTIVE SUMMARY

> Much of the developed world economy continues to exhibit shades of balance sheet-style recession, as indicated by sustained private sector debt deleveraging resulting in diminishing effectiveness of conventional monetary policy initiatives

> Application of unconventional monetary policies at the height of the crisis (for example: the US Federal Reserve’s QE1) had revived intermediation in wholesale funding and credit markets

> Unconventional monetary policies have successfully lowered liquidity and other market risk premia to pre-crisis levels; default risk premia have also been reduced but not as substantially

> Evidence on the success of these policies in achieving further economic growth is less compelling as witnessed by the diminishing efficacy of progressive applications (for example: QE2)

> Further application of unconventional policies, such as QE, may cause unintended price rises in riskier assets (for example: commodities) which may spill over to inflation; such transitory inflation may be detrimental in a climate of sub-par aggregate demand

> Unconventional monetary policy in an environment of deleveraging under conditions of a balance sheet recession would be more conducive for asset classes that rely less on buoyant economic growth.

Introduction

This article seeks to present some important implications from the Federal Reserve’s (Fed) use of unconventional or non-standard monetary policy (UMP)1 in an environment coloured by the aftermath of the GFC, and characterised by sub-par economic growth and general reluctance to take on debt. The relevance of this exercise lies in the fact that conventional monetary policy tools have reached feasible limits. For example in the US, the Federal Funds (FF) rate is now effectively at the zero lower bound.

The discussion will focus on how such measures work, and more importantly, why they have or have not. This study will use the US economy and US fixed income assets (for example: investment grade (IG) credit) as the ‘risky financial asset’ for illustrative purposes. Conclusions drawn can be applied to similarly developed economies and adjusted accordingly for other asset classes. We conclude by highlighting some broad implications for investors under such conditions given the (likely) persistence of these levels of UMP.

The implementation of Unconventional Monetary Policy: a brief overview

Implementation of UMP began in tentative fashion in August 2007 through heightened short-term liquidity provision2 as the subprime loan crisis escalated into a broader financial credit crisis. Initially the conventional policy tool, the FF rate, remained the major weapon to stabilise the economy. As the crisis lingered, more robust UMP measures were introduced which, at times, did arguably stem spread increases especially during the early stages of the crisis in the second half of 2007. However, while aggressive rate cutting continued into the second half of 2008, the pace of credit spread widening was slowed for only brief intervals due to the growing intensity of the crisis (see the circled section in Chart 1).

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1 By UMP, we refer to central bank tools other than the policy interest rate (and hence not commonly used).
2 Mainly through easing the supply terms of the standard discount window loans and increased liquidity provision to banks through repurchase agreements (repos). A repo is an agreement, pursuant to which the Fed would buy a particular security from banks with a promise to return it at a future date. The assets that the Fed acquires in return for providing short-term temporary liquidity are usually Treasury securities. So a repo is essentially a collateralised loan payable by the counterparty to the transaction. Simultaneously reserve deposits are created for banks.
The Fed clearly preferred the conventional FF rate mechanism, as seen by its efforts to shield UMP’s effects on its balance sheet\(^3\). The effects of this early use of UMP, as an accompaniment of conventional interest rate policy, appeared mild at best, were transitory and not sufficiently focused. However as FF rates neared levels close to zero going into the second half of 2008, any remaining influence on credit spreads waned to the point that credit spreads appeared to move independently of the FF rates (see the boxed section in Chart 1). With traditional policy interest rate actions progressively having less impact, there emerged greater acceptance of UMP to counter the effects of the crisis.

When markets hit emergency levels with the Lehman/AIG events of 3Q–4Q-2008, the Fed began intensifying the use of UMP, a move necessitated also by the loss of the FF rate as a viable policy tool. A new, more aggressive phase of UMP was entered into from this point on, roughly from about November 2008, as the Fed’s balance sheet\(^4\) was allowed to rise substantially (see Chart 2). This period included large scale asset purchases by the Fed termed ‘Quantitative Easing’ (also known as ‘QE1’ by market participants)\(^5\). The intention was two-fold – to stem crisis escalation and to prevent a severe recession. There would be a third phase of UMP, commonly known as QE2, in the second half of 2010 but that would be intended mainly to boost economic recovery.

The period of UMP implementation\(^6\), especially the more aggressive stages, did coincide with stability in credit markets and sustained spread narrowing. As noted, repeated FF rate cutting began to lose its effectiveness, quickly becoming irrelevant as target rates hit the ‘zero lower bound’. However before the success of unilateral UMP implementation can be claimed, a closer assessment of the evidence reveals that results may be dependent on the stage of crisis as well as the nature of the tools used. To analyse this further, we will demarcate the period of UMP implementation into three, broadly divided phases (see Table 1 below).

### Table 1: Broad phases of UMP

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
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<tbody>
<tr>
<td>Phase I</td>
<td>Jul/Aug 2007 to Sep/Oct 2008–Characterised by discretionary liquidity provision</td>
</tr>
<tr>
<td>Phase II</td>
<td>Nov 2008 to Mar 2010–Characterised by discretionary large scale purchases of financial assets and direct lending to non-bank entities. QE1 was part of this phase</td>
</tr>
<tr>
<td>Phase III</td>
<td>Nov 2010 onwards–Characterised by discretionary large scale purchases of Treasury securities, particularly medium to long-term tenures until June 2011 (QE2).</td>
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3 In order to maintain control of the federal funds market and the targeting of the FF rate, the Fed had to sell Treasuries to prevent reserves of the banking system, a major balance sheet item, from rising significantly.

4 The Fed’s Treasury sales (to keep its balance sheet from rising to maintain control of the target FF rate) were discontinued as its holdings of Treasuries began declining. With the payment on reserve balances (IOR) policy in October 2008, maintaining a fairly constant size of the Fed’s balance sheet became unnecessary.


7 From September 2011, the Fed announced measures to purchase longer-term Treasuries while selling shorter-term maturities labelled ‘Operation Twist’ by markets. This was followed by explicit commitments to maintain policy rates at existing near-zero levels into 2014. Since these measures are akin to QE2, they will be categorised and analysed as Phase III policies.
An assessment of the effects of Unconventional Monetary Policy: the impact on risk aversion in financial markets

Given that short-term wholesale funding markets tend to signal the market’s tolerance for risk and thereby indicate the direction of broader financial fixed income markets, it may be instructive to assess how UMP measures have worked here. As noted, early UMP implementation such as liquidity provisions through repos and easier lending arrangements which we have termed ‘Phase I’, was too tentative. In spite of the UMP measures implemented, risk spreads blew out significantly whenever fresh news of distress hit money and interbank markets, as seen by spikes in the LIBOR to T-bill spread (the TED spread) in Chart 3a below. Not surprisingly, credit spreads widened in tandem.

As the crisis worsened (for example: the Bear Stearns issue in March 2008), the Fed increased the use of existing UMP devices as well as introduced more robust initiatives (new standing loan facilities such as the Term Auction Facility, Primary Dealer Credit Facility and other similar liquidity enhancement measures8) and currency swaps with foreign central banks. These appeared relatively more effective in countering the rate of spread widening. One that did impart some benefit was the acceptance of non-Treasury instruments as collateral for access to Fed support facilities, thereby helping to make a market for which up until then were shunned assets.

Chart 3a: Initial UMP measures (for example: repos slowed but could not contain rising TED spreads)

Even though Fed efforts to facilitate re-intermediation in these short-term markets through UMP had intensified going into the second quarter of 2008, they could not prevent further escalation of the credit crisis. This was because problems associated with liquidity and credit availability quickly turned into concerns over corporate solvency when asset prices not only failed to recover but began a new downward cycle. As a result, TED spreads (as well as other risk indicators such as VIX, MOVE and A2/P2 spreads) continued rising into the third quarter of 2008. In short this initial phase of UMP, though appearing effective at times, could not contain further rapid rises in risk aversion as more acute events emerged (for example: the Lehman/AIG episode).

The second phase of UMP implementation, from about November 2008, was characterised by substantial increasing of the Fed’s balance sheet (seen earlier in Chart 2) from aggressive, large scale purchases of assets. That is QE1, which involved buying ‘riskier’ assets such as agency debt and mortgage-backed securities, was enacted.

At the same time, the Fed intensified the use of existing measures. An example was the use of targeted provision of loan facilities to non-bank entities such as the extension of special loans to AIG beginning in November 2008 as well as to participants in specialised credit markets, for instance the commercial paper (CP) market. The sustained and aggressive use of these measures appeared to have

Chart 3b: More aggressive UMP moves needed to stem risk aversion (changes in Reserve balances and TED spreads)

8 For full details on these and other similar Fed market support facilities, refer to ‘Monetary Policy’ on the Federal Reserve website, www.federalreserve.gov/monetarypolicy/bst.htm.
successfully turned the corner on TED spread widening early in the fourth quarter of 2008, as shown in Chart 3b above. This outcome is also repeated for broader credit assets, albeit with a slight lag as shown in Chart 3c below.

Chart 3c: UMP Phase II (which included QE1) coincides with falling IG spreads

This trend of credit spread narrowing, from January 2009, occurred despite a deteriorating economic environment which would not turn for at least another three quarters or so (see Chart 4). In light of the above discussion, it is reasonable to infer that sustained narrowing of spreads was due to significant mitigation of risk aversion through efforts to revive market intermediation.

Chart 4: Economic conditions (Industrial Production growth) and IG spreads

The third UMP phase, popularly known as ‘QE2’ first alluded to by Governor Bernanke in August 2010 and officially announced in November 2010, involved the Fed ‘swapping’ its holdings of risk assets into longer-term Treasury notes. This was soon expanded to outright market purchases of Treasuries. As noted earlier, the purpose was to boost the economy, given the abating of the crisis, as recovery remained slow and fears of deflation began to surface. After all, risk aversion had reduced significantly especially in wholesale interbank markets with the TED spread almost at pre-crisis levels from the third quarter of 2009 onwards (see Chart 5).

Chart 5: UMP Phase II (which included QE1) coincides with reduction in risk aversion

As was mentioned earlier, the stabilising of short-term wholesale funding markets accompanied, and arguably preceded, receding volatility in broader fixed income markets. Certainly substantial reduction of risk aversion in private credit markets was a major tangible achievement. It is also interesting to observe that UMP Phase II incorporating QE1 had the most significant ‘risk removing’ effect, at least insofar as credit markets are concerned. In fact comparing the effects of QE1 and QE2 on IG spreads, using higher frequency data, cements the above finding (see Chart 6).

Chart 6: UMP impact on risk aversion in credit markets

Although we should also acknowledge the role of Federal Treasury initiatives to assist Fed actions (for example: Troubled Asset Relief Program or TARP).
An assessment of the effects Unconventional Monetary Policy: the impact on economic fundamentals

However while financial market stability, and hence, sustained spread narrowing has been accomplished, there is increasing evidence that such unconventional policies have not delivered the desired lasting economic improvement (see Charts 7a to 7c). This is especially obvious with the third phase of UMP (QE2), which is rather disappointing.

After all, QE2 was intended as an economic, rather than a market, stabilising panacea. In comparing QE1 and QE2, the former was clearly the more efficacious. This can be seen in Chart 8 below where a growth-related economic variable such as the All-Economy ISM performed better at the end of QE1. It is, thus, reasonable to infer that simply pulling the trigger and pushing out more UMP measures may just result in diminishing rates of success.

Chart 7a: UMP Phase I (Jul 2007 to Sep 2008) and major economic variables

Chart 7b: UMP Phase II (Nov 2008 to Mar 2010) and major economic variables

Chart 7c: UMP Phase III (Aug 2010 to Jun 2011) and major economic variables

Chart 8: Greater improvement in business and economic expectations during QE1 relative to QE2

Source: Barclays and Bloomberg, Macquarie August 2012
Exploring Unconventional Monetary Policy’s channels of transmission

This phenomenon of diminishing efficacy can be understood better by looking at how the Fed’s UMP measures transmit their effects to the broader economy and market. Firstly, such policies seek to impart expansionary effects through reducing general risk aversion and lowering long-term interest rates, as well as an added channel through the rebalancing of portfolios, which the Fed had anticipated UMP Phases II and III would achieve. By changing specific prices and yields, and boosting overall asset prices, a second round of stimulatory wealth effect could be generated, thereby raising incomes and expenditure. Finally, the expected positive impact on both lender and borrower balance sheets could also spur lending activity, and facilitate growth in capital expenditure.

However, even if the above policy effects on monetary conditions eventuate, their overall net impact on real economic activity may still be small. Firstly, the lowering of long-term rates, all else being equal, from QE may be modest – at best 50 basis points on average as shown by the Fed’s own research, a finding in line with key academic work for example a yield reduction from QE2 of about 20 basis points by academics Hamilton and Wu. In reality, long-term rates ended up higher after both QE1 and QE2 (see Chart 9). While not terribly surprising given that long-term rates were at near-historical lows to start with, higher long-term yields occurred most probably because disinflationary momentum had been stemmed, a point that will be explored in more detail below. Bernanke himself admitted that low long-term rates, in the first place, were more a reflection of a weakening economy rather than a result of fundamental loosening of monetary conditions.

There is also a genuine concern here that even lower real long-term rates may not be sufficient to overturn weak economic expectations. An example is that recovery in longer-term expenditure such as non-residential investment has been slow as shown in Chart 10a. Of course, new residential investment remains weak given the moribund housing market. The chart also suggests that real investment spending need not always respond in the anticipated manner to changes in interest rates. As for the other (expected) positive effects of UMP measures, it is reasonable to infer that potential outcomes could be mixed, at best. For instance, portfolio rebalancing effects may be more diffuse, spilling over to other asset prices (for example: commodities and equities) rather than just inducing lower lending rates and boosting demand for goods and services (see Chart 10b). Moreover, positive wealth effects may not be as strong given current evidence that wealth effects are far greater from real estate than from financial assets (and we know how weak the former market is currently). This implies the housing market could be an even greater drag on incremental expenditure.

Chart 9: UMP, US long-term bond yields and inflation expectations

<table>
<thead>
<tr>
<th>QE1 announced</th>
<th>QE1 begins</th>
<th>QE1 purchases begin</th>
<th>QE1 ends</th>
<th>QE2 announced</th>
<th>QE2 begins</th>
<th>QE2 news*</th>
<th>QE2 ends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trend inflation</td>
<td>Phase II</td>
<td>Long-term bond yields</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
| Source: Barclays and Bloomberg, Macquarie August 2012


13 ‘However, more recently, as the pace of economic growth has slowed somewhat, longer-term interest rates have fallen…’, Chairman Ben S. Bernanke, At the Federal Reserve Bank of Kansas City Economic Symposium, Jackson Hole, Wyoming August 27, 2010, The Economic Outlook and Monetary Policy
14 Some commentators have pointed out that net portfolio rebalancing effects may be non-existent or even negative given that higher commodity prices could cause cost-push inflation in a weak economy ie stagflation. See Reuters Insider, ‘QE’S End to Send Dollar Up, Risk Assets Down, Says Mosler’ 12 May 2011 (http://insider.thomsonreuters.com/link.html?cn=share&type=group_channel&chid=3&cid=216601&shareToken=Mzp2ZmM20Q1Z1kMjFlTQS5NYWYXbZS00Mzd2ZjQ1ZGlyZS%3D%3D&start=0&end=488&cn=uid13761http://bit.ly/lKrkJk).
The inference of a less than impressive positive wealth effect from UMP measures, such as QE2, can also be gleaned from the state of the market for loans. Despite significant application of the Fed’s balance sheet, total credit growth has not been compelling (see Chart 11a). This is remarkable given that conditions appeared increasingly supportive, as overall balance sheets continued to improve while greater willingness to extend loans was clearly gaining traction (see Chart 11b).
Unconventional Monetary Policy under conditions of deleveraging and a balance sheet recession

So why has UMP Phase III, with its use of QE2, been relatively less effective in achieving its aims than Phase II’s QE1? The key to answering this is to consider the economic conditions, arguably still being faced to date, which the Fed had to work under.

The developments described in the previous sections are symptomatic of an economy in the throes of debt deleveraging which follow asset price declines resulting from financial crises. By re-aligning balance sheets towards greater savings in order to regain desired levels of positive net worth (see Charts 12a and 12b), the private sector is in fact adding even more drag to weak expenditure intentions. Such conditions also give rise to pressures which eventually drive short-term interest rates to zero.

Chart 12a: US private sector deleveraging activity remains at historical highs as savings outpaces investment

Source: US Department of Commerce, Macquarie August 2012

Chart 12b: US private sector deleveraging activity and US excess capacity

Source: US Department of Commerce, Federal Reserve and Conference Board, Macquarie August 2012

Heightened debt retrenchment, coupled with the sluggish pace of aggregate demand and low use of productive capacity in an environment of virtually zero interest rates, has been called a balance sheet recession. In contrast to your garden variety recession (where outright contraction in economic activity is the norm, that is negative GDP growth), balance sheet recessions tend to be characterised by positive but sub-par growth rates for a sustained period, usually over more than a year or two. This appears to be the case at least with the US, where private deleveraging may still have some way to go (see Chart 12c).

So while the economy grows, it does so at rates that are insufficient to absorb significant unused productive resources thereby giving rise to persistently higher than usual unemployment rates and/or stagnant capital expenditure expectations. A key consequence of being stuck in such a state of affairs is greater than normal susceptibility to fresh economic ructions and risk-inducing crisis events. In short, the presence of a balance sheet recession, one suspects, is a significant roadblock to the use of monetary policy, even unconventional variants, to effectively stimulate economic activity. Clearly, this is not good news on the outlook for the performance of risk assets in general.

Chart 12c: US household debt to income levels still in deleveraging phase

Source: US Department of Commerce, Macquarie August 2012

A reconsideration of Unconventional Monetary Policy’s achievements (or why QE2 was less effective than QE1 in hitting their goals)

It is important to reiterate that the key point of distinction among the three phases of UMP was the extent of the reduction in risk aversion, which incidentally was highest around the time of QE1’s announcement. This elevated risk climate was not present to the same degree at the start of QE2 as the credit emergency phase had passed. Any further retrenchment of risk aversion now had to come from economic improvement. Although deflationary expectations did appear to have been stemmed and may have reversed somewhat (as seen earlier in Chart 9), real economic activity has not revived as expected. This point can be seen in the shape of the interest rate term structure, with the steepening of its slope at around the period when QE2 entered market consciousness. Clearly the steeper yield curve was due more to inflationary expectations creeping in rather than being reflective of higher real yields–a rise in the latter is an indicator of economic improvement (see Charts 13a and 13b). This reinforces the view that UMP measures have been inadequate in boosting real economic activity.

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16 This has been the malaise plaguing Japan for the best part of two decades since their real estate crash of 1989-90. See Koo (2011), for a detailed and comprehensive discussion of balance sheet recessions http://www.paecon.net/PAEReview/issue58/Koo58.pdf.
In fact, QE2 should not have been expected to significantly boost lending and investment spending in the first place and thus to be of little impetus to real economic activity. This is because QE2 simply constituted a ‘swap’ of assets (of almost similar risk attributes but different maturities, that is Treasuries for reserves) with no new net financial assets added to the system (the Appendix expands on this). Therefore any fundamental economic impact will be modest. In that sense, any QE effect on expectations is more psychological than material and sustainability is questionable. Obviously this form of non-fundamentally driven ebullience could encourage market re-entrants to push up risk assets such as commodities (as seen earlier in Chart 10b). But again, for the same reasons, this cannot be expected to persist.

It is also our view that the fuelling of inflationary expectations, without corresponding changes in the fundamental economy, was an unintended effect of QE2. This means exogenous factors, rather than aggregate demand which has shown little significant strength, were the actual drivers of inflation. In short, this is more ‘cost-push’ style inflation rather than ‘demand-pull’ type pressures. Chart 14 hints at this as actual headline inflation which tends to get pushed around by external price factors did in fact rise around the period of QE2. However it gradually converged in the second half of 2011 to underlying inflation (a more reflective measure of structural demand) which did not move to the same extent.

Chart 14: UMP and impact on risk aversion in credit markets

Source: Barclays and Federal Reserve, Macquarie August 2012
QE2-induced effects may even be net negative given that higher, ‘cost-push’ induced prices in the presence of a tepid economy, even for brief periods, may be contractionary (stagflation anyone?). This last point is significant in that once UMP measures such as QE2 dissipates, commodity price effects would also fade and deflationary fears could return, perhaps with even greater intensity. Thus we could reasonably say that this is a clear unintended consequence of QE2.

This leaves us with the risk reduction effect. The Fed’s efforts at re-intermediating key short-term funding markets (for example: the interbank and CP markets and support of other higher risk credit markets) have significantly and sustainably lowered risk perceptions. As noted, all this mainly occurred in UMP Phase II with QE1 in operation. Such stabilising of markets is arguably the cause of strong spread narrowing.

Therefore while real economic activity may not be significantly higher going forward, the fear of a downward spiral is clearly off the table. For example, solvency fears for firms caused by liquidity and short-term funding difficulties would now be significantly mitigated. This can be observed in Chart 15 which shows rising default rates turning and moving into a declining trend during QE1’s implementation. However, further reduction of solvency or default risks will require stronger economic conditions. This is not the prevailing picture today, nearly five years out from when the credit crisis erupted17.

Implications and conclusions

The discussion above clearly makes a case for UMP in the event of severe market dislocation, particularly when standard policy tools (the Fed Funds rate in the case of the US) begin losing efficacy. Quick and clinical application of such policies have proven to be effective in reducing risk aversion in markets which certainly has been the case for fixed interest securities markets. The added lesson here is that the magnitude of policy response and the nature of assets targeted are critical. For example, QE1’s size and focus on riskier assets saw a sustained climb-down from ruinous levels of risk premia in the aftermath of the Lehmans/AIG crisis episode.

However, other findings have not been as positive. Simply put, when some semblance of stability has returned to markets, further application of such unconventional policies has proven less spectacular. More importantly, economic gains have not been obtained to similar extent nor have they persisted for any significant period of time. For example, QE2 has noticeably failed to boost real economic activity. At best, it has prevented deflationary fears from taking root.

Interestingly the more enduring memory of QE2 has been the short-term igniting of prices in ‘riskier’ assets such as equities and commodities. However, not only have these gains not sustained (and thereby fail to generate significant positive wealth effects), they have given rise to unintended ‘cost-push’ inflation. Such developments, in an environment of deleveraging and weak aggregate demand (that is, the balance sheet recession), can only harm further economic growth. Recall that economies under these conditions are susceptible to negative shocks.

In short, unconventional monetary policies such as QE2 is of limited scope to boost an economy mired in a balance sheet recession. At best, implementation can only reduce escalation of risk premia and limit fears of default. Economic growth is all together another matter. As a result, even the short-term price spurts by ‘riskier assets’ from more QE may diminish with successive applications as markets begin to realise the lack of sustainable impact on economic fundamentals.

Of course, policymakers may turn ‘radical’ and alter the nature of QE to buy ‘riskier assets’ such as equities, thereby prolonging the rally in such assets. However, for the reasons given in our discussion, the lack of impact on economic activity, would most certainly limit the sustainability of any gains. With this in mind, investments that rely on the diminishing of risk premia ought to be seriously considered. Assets requiring a sustainably stronger economic trajectory would not be preferred. However given the prevailing economic fragility associated with deleveraging and balance sheet recessions, it would be prudent also for investors to maintain significant positions in ‘safety-first’ asset classes.
APPENDIX: EXPLAINING THE LACK OF IMPACT OF QE2 ON ECONOMIC ACTIVITY

Reserves and lending from a banking system perspective

Before we touch on quantitative easing proper, we should clear up a key definitional issue, that of bank reserve balances (or simply ‘reserves’). Banks are required, operationally as well as by statute in certain countries, to keep reserve accounts at the central bank. These reserves are liabilities of the central bank—thereby assets of the banking system—and operate to ensure the payments, or more accurately, the settlements system functions smoothly. Without a viable system of settlement of funds (which includes net holdings of reserves), banks could easily find themselves unable to ‘honour’ another bank’s demands relating to the net claims arising from thousands (or millions) of transactions that occur daily when customer accounts are drawn upon. Of course, as commercial entities, banks endeavour to minimise the costs of maintaining these reserves.

Banks will seek funds to ensure they have the required reserves, whether statutory or transactionally determined, in the relevant accounting period. They can borrow from each other in the interbank market but note though, that if the system overall is short of reserves these ‘horizontal’ transactions will not add to the required reserves. In these cases, an individual bank will sell bonds back to the central bank or borrow outright, as part of the ‘normal’ central bank short-term lending at the policy rate or through the ‘discount window’ with the accompanying penalty rate.

The interbank market (for example, the federal funds market in the US) functions to ‘allocate’ the reserve balances that these banks keep with the central bank. This ensures that individual banks can meet their reserve targets (which might simply be zero balances) at the end of some regulatory period. In general, all central banks stand by to provide the reserves that are required by the system to ensure that all payments settle.

Given the above rationale for bank reserves, it can be seen that, on aggregate, the (existing) level of reserve balances has nothing to do with constraining the extending of loans, at least not directly; they exist in the banking system as a form of ensuring financial stability. Loans are not ‘funded’ by reserves balances nor are deposits required to add to reserves before a bank is able to lend. In other words, the level of reserves, or for that matter, deposits, does not operationally constrain loans.

Of course, for the reasons outlined above, banks do still require funds in the form of sufficient holdings of reserves in order to operate. It just means that they do not need reserves before they lend. In fact, the direction of ‘causality’ is the reverse. It is the creation of loans that gives rise to deposits and hence, reserves. To reiterate, reserves are needed for net settlements that transactions (including loans) give rise to. Loan decisions can and are made without direct recourse to the banks’ reserve positions.

So while banks do not lend reserves, they do ‘transact’ the reserves between themselves on a commercial basis. However, in doing so they cannot increase or reduce the total volume of reserves in the system. Only government to private transactions can change the net reserve position. All transactions between private entities net to zero.

We are not saying that reserves have no impact or influence on loans whatsoever. Notice the phrase used was ‘operationally constrain’, rather than just ‘constrain’. Loans are largely a function of future prospects balanced by relative marginal costs, which includes costs of obtaining funds to ‘settle’ the loans made as well as other transactions. So where reserves do come in is through the ‘costs’ of obtaining those reserves, especially at the margin or the incremental level required. As noted, banks always try and obtain cheaper sources of funds for their reserves settlement, at least no higher than the interest charged for their loans.

So, at the individual bank level certainly, the ‘price’ of reserves will play some role vicariously in the credit department’s decision to loan funds. But the reserve position per se will not matter. As long as the margin between the return on the loan and the rate they would have to borrow from the central bank (as the final resort to obtain net settlement funds) is sufficiently acceptable, the bank will lend. In short, the profitability of the loan desk is influenced by what they can lend at relative to the costs of the funds they have to get to satisfy settlement. So the influence of reserves on lending is indirect and from a commercial profitability perspective; however it is most definitely not an operational (that is, quantity or volume) constraining factor.

So, if reserve requirements do not limit bank lending, what does? The answer is the bank’s capital or shareholders’ funds which are bound by regulatory requirements. Bank balance sheets must rest on a certain ‘critical mass’ of paid-in equity, so making loans reduces a bank’s ability to make further loans. That is exactly how capital adequacy requirements are meant to work and of course, the whole point of their existence.

This appendix offers a very brief explanation on why QE2 fails to boost spending. For a more complete discussion, please see the following: http://moslereconomics.com/2008/12/17/quantitative-easing-for-dummies/ and http://bilbo.economicoutlook.net/blog/?p=661.
Implications for Quantitative Easing

Let us now apply the above to the implementation of a quantitative easing (QE) operation whereby the Fed buys Treasuries from the public – which was what QE2 amounted to. The Fed’s purchases of longer-term securities reduce the amount of such securities and increase the amount of reserves (notice that reserves are effectively equivalent to overnight securities). So QE ‘merely’ involves the government altering the mix of investments offered to investors. Interest rates, as always, continuously fluctuate to reflect current expectations of future Fed rate changes and current ‘technicals’ of supply and demand. QE changes those dynamics and results in a yield curve that reflects those conditions. The Fed’s purchases of longer-term Treasury securities is functionally identical for the economy to the Treasury having issued short-term bills. The Fed ‘creates excess reserves’ and purchases Treasuries.

Note that the Treasuries are already in existence; the Fed buys them from bank balance sheets, not from the Treasury. They are already part of the financial system. When the Fed buys these Treasuries and transfers them to its balance sheet, it gives the financial institutions an equal amount of reserves and hence, there are no new net financial assets in the banking system. Obviously, the structure of the assets is different, but the amount of assets is the same.

Since QE simply swaps one type of asset for another, it does not alter the net financial assets of the private sector in any significant way, merely their composition. Consequently, there is no significant boost to the private sector’s purchasing power in aggregate. They possess fewer bonds but more reserves. More significantly, the private sector has relinquished higher interest earning bonds for lower interest earning reserves, thus reducing purchasing power. However, they have sold them at a higher price due to QE, thereby increasing purchasing power. The net effect tends to be insignificant, especially given the current state of low yields.

To conclude that there must be ‘greater purchasing power’ in the private sector from having more ‘funds’ is simply not the case. That is why the term ‘quantitative’ can be misrepresentative – there are no new quantities of net funds from altering the composition of the private sector’s net financial assets, and hence no ‘quantitative encouragement’ to greater spending in the real economy. Prior to QE, individual holders of Treasuries were at liberty to exchange their bonds for cash if so desired. Since the desire to spend on real goods and services remains weak (or absent), there is no reason to convert to cash; alternatively the assets could have been used as collateral to obtain ‘cash’ to buy goods.

Under QE, the private sector became willing to convert to ‘cash’, not due to a greater desire to spend but because the Fed had pushed up the price of longer-term bonds. This in essence makes the private sector willing to alter the composition of their savings, but not necessarily the level of their savings. People are net saving by definition—that is, Treasuries outstanding plus cash in circulation plus reserves—are just the tangible record of the cumulative deficit spending, and is an identity.

Hence QE is not printing money in the sense that no new loans are created in the process and if, as is usually the case, only banking institutions take part in the exercise, no new deposits are created as well. So when QE is going on, there are some savers getting fewer coupons which constrains their aggregate demand, and banks moving out of duration assets and into cash reserves.

From the perspective of a bank, more reserves held at the Fed (instead of T-bonds on its books) do not mean it has more funds to lend. Recall, in our discussion earlier, that the volume of reserves does not constrain nor ‘cause’ fresh loans. It is, of course, the other way round. As explained above, loans, from a supply perspective, are constrained by capital and the lender’s propensity to extending loans, such as internal risk management policies and the marginal benefit of the loan relative to its marginal cost. The only purpose of reserve balances are to settle net financial flows between banks arising from transactions, including intermediary actions, involving banks and the non-bank sector. So there is no reason to believe that it will cause anything more than changes in sentiment or expectations. That is why risk assets such as commodity prices may rise temporarily. See Appendix Table 1 for a simplified series of transactions that illustrate these points.

For QE to have a positive impact on aggregate demand, and potentially cause inflation, is if it significantly lowers borrowing rates. However this is a second stage effect and by no means assured. For example, if the economy is highly depressed (say, in a balance sheet recession), lending rates tend to be already low. Then, of course, the marginal impact on real consumption and investment has to be sufficiently high from a change in interest rates. Note that inflation becomes a problem only when the economy’s productive capacity is near capacity, a scenario that is unlikely from a lengthy spell of stagnation. Our discussion in the main text has made a case that these direct follow-through effects on the US economy from QE2 have been small.

So for QE to impact real spending, and therein inflation, the policy would need to induce a change in the saving behaviour of the private sector. Remember changing one form of savings for another does not lead to more spending in a given point in time.
### Appendix Table 1. Simplified example of a QE transaction

#### Starting point

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<thead>
<tr>
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<tr>
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<tr>
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<tr>
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<tr>
<td>Loans to Bank B</td>
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<tr>
<td>T-bonds</td>
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<td>10</td>
</tr>
<tr>
<td>Federal Reserve</td>
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</tr>
<tr>
<td>‘Assets’ (Treasury Deposits at Banking System)</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Reserve Balances</td>
<td>Banking System</td>
<td>Banking System</td>
</tr>
<tr>
<td>T-bonds</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

**Action: QE2 – Fed buys 10 T-bonds from banking system**

<table>
<thead>
<tr>
<th></th>
<th>Bank A</th>
<th>Bank B</th>
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<tbody>
<tr>
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<tr>
<td>Deposits</td>
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<td>100</td>
</tr>
<tr>
<td>Loans</td>
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<td>130</td>
</tr>
<tr>
<td>Capital</td>
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<td>10</td>
</tr>
<tr>
<td>Loans to Bank B</td>
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</tr>
<tr>
<td>T-bonds</td>
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<td>5</td>
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<tr>
<td>‘Assets’ (Treasury Deposits at Banking System)</td>
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<td>Reserve Balances</td>
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<tr>
<td>T-bonds</td>
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</table>

**Non-Bank Public X**

<p>| | | |</p>
<table>
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<tr>
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<td>Loans</td>
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<td>10</td>
</tr>
<tr>
<td>Net Worth</td>
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<td>10</td>
</tr>
</tbody>
</table>

**Action: Bank A ‘speculates’ on commodities, pays 10% more for X’s holdings**

<table>
<thead>
<tr>
<th></th>
<th>Bank A</th>
<th>Bank B</th>
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<td>Loans</td>
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<tr>
<td>Loans to Bank B</td>
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<tr>
<td>T-bonds</td>
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<tr>
<td>Commodities</td>
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<tr>
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<td>‘Assets’ (Treasury Deposits at Banking System)</td>
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</tr>
<tr>
<td>Reserve Balances</td>
<td>Banking System</td>
<td>Banking System</td>
</tr>
<tr>
<td>T-bonds</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

**Non-Bank Public X**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Deposit at Banks A and B</td>
<td>191</td>
<td>180</td>
</tr>
<tr>
<td>Loans</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td>Net Worth</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>
Results

After QE2 : Asset swap by Fed

NO NEW NET VOLUME INCREASE IN FINANCIAL ASSETS (may be thought of as ‘liquidity’) AFTER QE2

- Minimal change in deposits but no change in loans; hence no change in money supply
- Reserves rise by amount of T-bonds purchase
- Long-term interest rates may or may not change

Second round effects :

- Portfolio rebalancing
- Possible confidence rise, so possible rise in appetite for risk assets
- Possible positive wealth effect to spur real demand but deflationary effect from higher commodity prices; net effect unknown
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