Quantitative Easing

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It has been over ten years since the U.S. Federal Reserve (Fed) initiated a colossal expansion of its balance sheet; the largest since the Great Depression. Compelled by the financial crisis of the 2008, the Fed started to provide loans to the banking sector, which was suffering from a freeze of interbank lending. However, as banks recovered from the crisis the Fed did not shrink its balance sheet but instead expanded it further, buying up assets such as long-term government debt in large quantities. This was done in a bid to stimulate aggregate demand, which slumped during the Great Recession. Known as Quantitative Easing (QE), these interventions acted as a placeholder for conventional monetary policy, which had become powerless as the policy rate had hit the zero lower bound. Similar interventions took place in the UK and the Euro Area, as well in Japan during the early 2000s.

While conducting QE, central banks received little guidance from economic theory, as this type of policy is completely ineffective in modern textbook models such as the standard New Keynesian (NK) model. Nevertheless, central bankers have carried on with QE, presumably believing that it is a useful instrument to manage aggregate demand. However, a decade into the balance sheet expansion it is still not well understood when to use QE, how aggressively to use it, and when to roll it back. This leaves central banks in a precarious position in the face of upcoming recessions, when the limits of conventional monetary policy might once again be reached.

This paper presents a quantitative NK model to provide policy makers with more guidance on how to use QE as a stabilization instrument. To this end, we extend the model to allow for household heterogeneity and assets with different degrees of liquidity. In this setting, QE stimulates aggregate spending by transforming the liquidity composition of households' asset portfolios. After the intervention households hold more deposits, which are fully liquid, and less partially liquid wealth stored in mutual funds. With a larger fraction of their wealth held in the form of deposits, households are induced to spend more. This prediction of the model is in line with empirical evidence, which shows that the propensity to spend out of deposits is much higher than the propensity to spend out of less liquid sources of wealth, such as wealth stored in mutual funds. Moreover, the data show a surge in deposits following the various rounds of QE, much of which ended up being held by households.

We use the model to compare the power of QE to conventional interest rate policy. We find that QE is a very effective instrument to anchor expectations and to stabilize output and inflation. However, QE interventions come with strong side effects on inequality, which can substantially lower social welfare. A very simple QE rule, which we refer to as *Real Reserve Targeting*, is approximately optimal from a welfare perspective when conventional interest rate policy is unavailable. We further estimate the model on U.S. data and find that QE interventions greatly mitigated the decline in output during the Great Recession.