The Effectiveness and Transmission Mechanism of Unconventional Monetary Policies

Gert Peersman

Ghent University
Motivation

- As policy rates reached their effective lower bounds after the collapse of Lehman, monetary authorities adopted a variety of non-standard measures to provide further stimulus and counter risks to financial stability
  
  - Operations that change the size and composition of their balance sheets, and actions that try to guide longer-term interest rate expectations

- This lecture: the effectiveness of such policies, the macroeconomic effects of the accompanying increases in the balance sheets, and the exit strategy
  
  - Focus on Fed and ECB: differences closely related to financial structures: Euro area centers on commercial banks, while US primarily based on capital markets
Motivation
Conventional transmission mechanism in a nutshell

Overnight interest rate (via monetary base) ↓

⇓

Other interest rates ↓ and asset prices ↑

⇓

Investment and consumption ↑

⇓

Economic activity ↑

- Does not work anymore when overnight interest rates are constrained by the zero lower bound
Shaping interest rate expectations

- Not overnight rate, but anticipated path of short-term rates determines longer-term interest rates, asset prices and ultimately spending decisions

- Expectations theory of the yield curve:

\[
(1 + i_t^{(n)})^n = (1 + i_t^{(1)})(1 + E_t^{t+1}) \cdots (1 + E_t^{t+n-1}) + \sigma_n + \eta
\]

  - \( \sigma \) = term premium
  - \( \eta \) = risk/liquidity premium

- Additional stimulus possible by explicitly communicating a commitment to keep policy rate low for a **longer period than previously expected**
  
  - Markets have to believe this, even if this is not consistent with price stability
Forward guidance of the Fed

- December 2008: target FF-rate likely to remain unchanged “for some time”

- March 2009: language strengthened to “an extended period”

- August 2011: “exceptionally low levels until at least mid-2013”, extended to “late 2014” and “mid-2015”

- Since September 2012: “at least as long as the unemployment rate remains above 6.5%, and inflation forecast below 2.5%”
Forward guidance of the Fed

• Notice: Fed has always been careful by offering federal funds rate forecasts, and not any explicit commitments

• Each statement nevertheless resulted in significantly reduced expectations by financial markets, for example:
  
  – December 2008: 90bp decline in market expectations FF-rate the following year
  
  – August 2011: 15-20bp impact on 10 year government bond yield (similar as 75-100bp decline in FF-rate in normal times)

• Not clear whether this is (solely) result of communication policies
Outright Monetary Transactions (OMT) of the ECB

- ECB has been more careful with its communications
  - July 2013: expect key interest rates “to remain at or below their current levels for an extended period of time”
  - Is more interpreted as a clarification of its reaction function

- OMT-bazooka: unlimited purchases of short-term government bonds from countries that have agreed to strict policy conditions (no seniority claims)
  - September 2012 (Draghi in July: “do whatever it takes to save the euro”)
  - Can be considered as a game changer in the euro crisis
Outright Monetary Transactions (OMT) of the ECB
Central bank balance sheet policies

- Further stimulate economy by altering the composition of balance sheet, or by buying securities beyond the level to hold the overnight rate at zero
  - Quantitative Easing versus Credit Easing

- Complements communication policies as concrete action to signal intended future policies, because it is costly to reverse large asset purchases

- If QE is sufficiently aggressive and long-lived, it could have expansionary fiscal policy effects, because government is only shareholder of Fed
  - Replacing interest-bearing government debt with non-interest-bearing currency or bank reserves
If financial markets are perfect: no effect on asset prices or the economy

- Asset prices and long-term interest rates solely depend on expected future returns, adjusted for risk

\[
(1 + i_t^{(n)})^n = (1 + i_t^{(1)})(1 + E_t i_{t+1}^{(1)}) \ldots (1 + E_t i_{t+n-1}^{(1)}) + \sigma_n + \eta
\]

- Other investors simply sell their holdings and rebalance their portfolios with money or securities sold by central bank: asset prices and long-term rates remain constant

- Is a critique that several economists have on QE programs: economy is essentially in a liquidity trap
• If money/securities sold by central bank are imperfect substitutes for asset purchases, investors will rebalance portfolios by buying assets which are better substitutes

  – For example: pension funds or insurance companies prefer long-term securities and will try to restore duration of their portfolios

  – If financial markets are incomplete or segmented, it is possible to influence term, risk and liquidity premiums

\[
(1 + i_t^{(n)})^n = (1 + i_t^{(1)}) (1 + E_t i_{t+1}^{(1)}) \ldots (1 + E_t i_{t+n-1}^{(1)}) + \sigma_n + \eta
\]

  – Note: term premium is common across countries (spill-over effect of QE)
LSAP & ME Programs of the Fed

- **QE1 (11/08 & 3/09):** $1450 billion ABS + $300 billion government securities
- **QE2 (11/10):** $600 billion government securities
- **Operation twist/MEP (9/11):** $667 billion switch between short-term and long-term securities
- **QE3 (9/12):** open-ended monthly $40 billion ABS + $45 billion government securities
- **Some other (smaller) programs after the collapse of Lehman**
LSAP & ME Programs of the Fed

• Programs did manage to reduce long-term interest rates

• Estimated effects bigger in event studies, relative to econometric analysis

• Gagnon et al. (2011): QE1 lowered 10 year government bond, agency debt and agency MBS respectively 91, 156 and 113 basis points
  – Also Baa corporate bonds 67 basis points

• QE2 and MEP less effective (anticipated?)

• Also impact on foreign interest rates, dollar exchange rate, and no effect on inflation expectations
Full allotment strategy of the ECB

- Only $1/5^{th}$ of balance sheet increase due to outright asset purchases: two covered bond purchase programs (€76.4 billion) and Securities Markets Program (€219.5 billion).

- Remaining expansion is essentially “demand-driven”
Full allotment strategy of the ECB

Panel A: Monetary policy of the ECB in normal times

1. Demand for euros is a negative function of the interest rate
2. Supply of euros by the ECB
3. Interest rate is determined by supply and demand

1. Increased supply of euros by the ECB
2. Result is fall in interest rate
Panel B: Full allotment strategy of the ECB and demand-driven expansion of balance sheet

1. Volume of euros supplied by the ECB

2. Unpredicted rise in the demand for euros

1. Fixed interest rate with full-allotment

2. Unpredicted rise in the demand for euros is automatically accommodated

Interest rate vs. Volume of euros
Full allotment strategy of the ECB

• Balance sheet expansion by stimulating liquidity demand by banking sector
  
  – List of eligible collateral accepted in refinancing operations has been extended several times

  – Maximum maturity of long-term refinancing operations extended from 3 months to 6 months (2/09), 12 months (6/09) and 36 months (12/11)
LTRO’s and term structure of interest rates

Samenhang tussen ECB rente en andere rentevoeten in normale tijden (monetaire transmissiemechanisme)

bron: ECB
LTRO’s and term structure of interest rates

Het wegvallen van de link tussen ECB rente en andere rentevoeten

- Eerste rukwinden in bankensector (juli 2007)
- Lehman Brothers en start onconventioneel beleid (oktober 2008)
- Voor 1000 miljard leningen op 3 jaar (december 2011)

bron: ECB
Macroeconomic effects of balance sheet policies

In order to properly assess the macroeconomic effects, the challenge is to identify exogenous innovations to the central bank balance sheets

- Disentangle from endogenous responses to fluctuations in economic activity and financial markets

- Structural Vector Autoregressive (SVAR) models: multivariate representation of macro variables (including lagged effects), where structural exogenous shocks that drive the variables are identified by imposing a minimum set of restrictions

Peersman (2011): ECB responses not fully “unconventional” in their essence

- Innovations to balance sheet in pre-crisis period (for a given policy rate) had a similar effect on output, prices and credit supply as conventional shifts in the policy rate
Macroeconomic effects of balance sheet policies

- Gambacorta, Hofmann and Peersman (2013): exploit cross-sectional dimension of unconventional monetary policies during the crisis
  
  - Panel SVAR for eight countries (US, EA, UK, JP, CA, CH, SE, NO) that reached the zero lower bound, estimated over sample period 2008M1-2011M6
  
  - Implied stock market volatility (VIX) as a proxy for financial risk/uncertainty
  
  - Note: panel estimations reveal that there are no major differences of the effects of balance sheet increases across countries, despite the heterogeneity of the measures that were taken (note: bigger impact on prices in Euro area)
Macroeconomic effects of balance sheet policies

- **Output**
- **Prices**
- **VIX**
- **Central bank total assets**
Macroeconomic effects of balance sheet policies

• Output and prices display a significant temporary increase
  
  – Response pattern of output is qualitatively very similar to conventional monetary policy shock (e.g. Christiano et al. 1999; Peersman and Smets 2003)

  • Back-of-the-envelope calculation: exogenous doubling of balance sheet has similar effect as 300bp interest rate cut

  – Impact on consumer prices less persistent compared to conventional shocks

  – Peak effect of balance sheet shock about three times larger than peak effect on prices (for interest rate shock is this typically 1,5 times)

  • Potentially due to convexity of AS-curve (e.g. Ball and Mankiw 1994)
Macroeconomic effects of balance sheet policies

- Balance sheet fluctuations mainly endogenously driven by other shocks
Macroeconomic effects of balance sheet policies

Macroeconomic effects of balance sheet policies

- Equity prices
- Sovereign bond yields
- Euro area nominal effective exchange rate
- 3 month money market rate
- Bank CDS rate
- M3
Macroeconomic effects of balance sheet policies

- Volume of loans to households
- Interest rate loans to households
- BLS survey - supply households
- BLS survey - demand households

- Volume of loans to non-financial corporations
- Interest rate loans to non-financial corporations
- BLS survey supply non-financial corporations
- BLS survey demand non-financial corporations
Macroeconomic effects of balance sheet policies
Macroeconomic effects of balance sheet policies

Ireland

Portugal

Luxemburg

Greece

Estonia

Cyprus

Slovenia

Slovak Republic
Macroeconomic effects of balance sheet policies

- Countries where banks have more capital seem to react more to liquidity measures of the ECB
Exit strategy

• Note: careful with long-run effects such as excessive risk-taking in financial markets, delayed public and private sector balance sheet repair

• As long as the economy is sufficiently below full capacity (and inflation expectations well anchored): no inflationary pressures
  – Most of liquidity currently held as excess reserves by banks at the central bank
  – Firms will only raise prices when demand is strong and production costs rise
  – A scenario of secular stagnation is even possible
  – But: if the economy recovers and banks have more opportunities to lend, we clearly need an exit strategy
Exit strategy

- Some measures have built-in and self-correcting mechanisms
  - E.g. full-allotment strategy, securities and lending which mature, ...

- Increasing reserve requirements

- Raising interest rates, in particular rate on excess reserves
  - Market rates will never fall below interest rate on excess reserves: policy stance

- Offering term deposits or conduct large-scale reverse repo’s

- Selling assets into the open market in exchange for liquidity
Too little, too late?

• Although exit is theoretically perfectly possible, inflation could be relatively high for a while and/or strong asset inflation once the economy recovers (especially in US)

• Little historical experience to determine optimal timing
  
  – Prompt withdrawal could distort recovery and have undesired consequences

  – Brainard (1967): if shift in policy tool has uncertain effects, it should be used more cautiously than a shift in policy tools that have more certain effects

  – Note: delayed response is part of forward guidance
Too little, too late?

• Shrinking balance sheets will harm economic activity in a similar way that it stimulated the economy during the crisis
  – Could trigger another recession + strong political opposition to do so

• Balance sheet normalization could lead to considerable losses for central banks: falling asset prices and/or high interest payments on reserves
  – Every dollar central banks lose is the taxpayers’ money (more capital might be needed): political pressure against it and difficulties to maintain independence

• Financial repression: policymakers do not mind higher inflation because it contributes to debt normalization
  – Note: in Euro area, this will rather be in the North, whereas debt overhang problem of the South