

Contents lists available at [ScienceDirect](#)

## Journal of Macroeconomics

journal homepage: [www.elsevier.com/locate/jmacro](http://www.elsevier.com/locate/jmacro)

# The macroeconomic impact of unconventional monetary policy shocks<sup>☆</sup>

Annette Meinus, Peter Tillmann\*

Justus-Liebig-University Gießen, Germany

## ARTICLE INFO

## Article history:

Received 22 December 2014  
 Revised 9 November 2015  
 Accepted 9 November 2015  
 Available online xxx

## JEL Classification:

E32  
 E44  
 E52

## Keywords:

Qual VAR  
 Unconventional monetary policy  
 Large-scale asset purchases  
 Zero lower bound  
 Quantitative easing

## ABSTRACT

With the Federal Funds rate approaching the zero lower bound, the U.S. Federal Reserve adopted a range of unconventional monetary policy measures known as Quantitative Easing (QE). Quantifying the impact QE has on the real economy, however, is not straightforward as standard tools such as VAR models cannot easily be applied. In this paper we use the Qual VAR model (Dueker, 2005) to combine binary information about QE announcements with an otherwise standard monetary policy VAR. The model filters an unobservable propensity to QE out of the observable data and delivers impulse responses to a QE shocks. In contrast to other empirical approaches, in our model QE is endogenously depending on the state of the business cycle and is studied in terms of unexpected policy shocks. We show that QE shocks lead to a fall in interest rates, an increase in stock prices and a rise in real economic activity and inflation.

© 2015 Elsevier Inc. All rights reserved.

## 1. Motivation

In the wake of the recent financial crisis, the policy rates of almost all central banks in industrialized countries reached the zero lower bound of nominal interest rates, and will remain at historically low levels for the time being. Nominal interest rates near their lowest possible level create a challenge for central banks leaving little room for further cuts to provide stimulus to the financial sector and the wider economy when necessary.

Facing this limitation central banks such as the U.S. Federal Reserve introduced Quantitative Easing (QE) measures to implement a further monetary stimulus. Quantitative Easing covers actions that expand the central bank's balance sheet such as large-scale asset purchases (LSAP) and those that change the maturity composition of the Fed's bond portfolio, i.e. the Maturity Extension program also known as "Operation Twist". Another instrument of the central bank's unconventional toolkit is a measure known as Forward Guidance. While the Federal Reserve started to gradually reduce, i.e. 'taper', its program of monthly purchases of government and mortgage bonds in late 2013/early 2014, the European Central Bank adopted a quantity-based program to revitalize the sluggish euro area economy in January 2015.

<sup>☆</sup> We are grateful to the editor of this journal and two anonymous referees for many helpful comments. We also thank Tim Oliver Berg, Marcel Förster, Gregor von Schweinitz and seminar participants at the Bundesbank, the ifo Institute Dresden, the IWH Halle, Giessen University, the University of Trier and the Verein für Socialpolitik (Hamburg 2014) for helpful comments.

\* Corresponding author.

E-mail addresses: [annette.meinusch@wirtschaft.uni-giessen.de](mailto:annette.meinusch@wirtschaft.uni-giessen.de) (A. Meinus), [peter.tillmann@wirtschaft.uni-giessen.de](mailto:peter.tillmann@wirtschaft.uni-giessen.de) (P. Tillmann).

Against this background, the central question from both a policy and a research perspective is how QE actions affect the real economy. In this paper, we want to give a quantitative answer to this question. For macroeconomists intending to analyze monetary policy, vector autoregressive (VAR) models introduced by Sims (1980) are the tool of first choice. However, unconventional monetary policy measures such as QE actions pose a challenge to standard VAR analysis. Since there is no single policy instrument whose variation reflects unconventional policy steps, QE measures are often modeled as a binary indicator which could be used, for example, for event study regressions but which cannot easily be implemented in a conventional VAR model. Likewise, QE steps are likely to be endogenously depending on the state of the business cycle and cannot simply be modeled as dummy variables only.

We offer an alternative approach to estimate the impact of QE on the macroeconomy. The model integrates information from the announcements of QE into an otherwise standard monetary policy VAR. One can think of the observable binary indicator of QE actions as a variable behind which lies a continuous latent, i.e. unobservable variable, reflecting the propensity to unconventional monetary policy. Based on the dynamic interaction within the VAR model, Markov Chain Monte Carlo techniques can filter this latent variable out of the data which then provides us with a continuous series on monetary policy's propensity to QE. Since this variable is a regressor in the VAR model, in a next step it enables to analyze the effects of an unanticipated QE shock through the derivation of impulse response functions. The resulting model is a Qual VAR (Dueker, 2005). Thus, the Qual VAR is essentially a combination of a standard VAR system with the event-studies literature which uses binary policy announcements. The important contribution of the Qual VAR is that the policy announcements can be modeled endogenously.

The advantages of the Qual VAR are threefold: first, we take explicit account of the endogenous nature of Quantitative Easing. Rather than including QE announcements as an exogenous variable in an event study or a panel model, we model the interaction with business cycle variables – very much like in a standard monetary policy VAR. Second, since we eventually estimate a standard VAR, we can discuss the effects of policy in terms of shocks. That is, we account for the fact that many announcements of unconventional measures have been anticipated by market participants and focus on the unexpected part of QE only. Third, the model provides a way to link macroeconomic, i.e. low-frequency data to QE announcement days which are often modelled as a binary variable.

The model is estimated on U.S. data since the end of 2007. We extract a latent variable that is intended to reflect the Fed's propensity to enter into QE. The resulting impulse response functions suggest that QE does indeed have a significant and sizable effect on both real economic activity and the financial sector. Shocks to QE raise output and inflation and lower nominal long-term interest rates, respectively. Furthermore, QE shocks push equity returns and, in a separate specification, also raise the Fed's balance sheet. We are also able to track the impact of QE over time. We find that QE has only moderate explanatory power for the endogenous variables.

The remainder of this article is organized as follows. Section 2 gives account of previous empirical work on the effects of QE and explains in what sense this paper improves upon previous research. Section 3 lays out the empirical methodology and the data set. Our results are discussed in Section 4. A set of robustness tests is presented in Section 5. Finally, Section 6 draws some conclusions.

## 2. The effects of QE: what do we know?

Over the recent years, the empirical literature on the effectiveness of unconventional monetary policy grew in tandem with the Fed's balance sheet. When it comes to quantifying the effects of QE, however, the basic difficulty is that there is no well-defined policy instrument whose variation indicates the Fed's comprehensive policy stance. Over the past 30 years the monetary policy literature had agreed to interpret the Federal Funds rate as the Fed's main instrument for conventional monetary policy. With the Fed Funds rate at zero, however, it no longer serves this purpose.

One way to provide an overview over the relevant literature is to argue that the empirical literature differs in the choice of the policy instrument used to measure unconventional policies. The biggest strand of the literature focuses on the announcements of QE measures themselves.<sup>1</sup> Often, high frequency data is used to study the immediate response of financial variables to QE surprises. These surprises are extracted from futures markets. The most important contributions to the event-study literature are Gagnon et al. (2011); Krishnamurty and Vissing-Jorgensen (2011); D'Amico et al. (2012); Swanson (2011); Glick and Leduc (2013) and Neely (2015). It is typically found that domestic interest rates fall upon a QE announcement. In addition, the USD weakens against major currencies.<sup>2</sup> The problem with this line of research is that it is confined to financial data only. Linking macroeconomic variables to QE announcements while controlling for business cycle dynamics is difficult. The approach proposed in this paper, however, is able to proceed along these lines. Furthermore, the size and the timing of unconventional policy actions are endogenous and reflect the business cycle. Thus, the model should allow for a feedback from macroeconomic variables to policy actions.

Another strand of the literature uses the Fed's balance sheet directly. Gambacorta et al. (2014) estimate a panel VAR model consisting of countries that adopted QE such as the US, the euro area and Japan. QE shocks are identified using sign restrictions

<sup>1</sup> For a critical view on the event-study evidence on the effectiveness of QE see Thornton (2015).

<sup>2</sup> Wright (2012) offers a SVAR model in which QE shocks are identified using volatility clustering on announcement days. Neely (2014), however, questions the stability of this VAR model.

Download English Version:

<https://daneshyari.com/en/article/965207>

Download Persian Version:

<https://daneshyari.com/article/965207>

[Daneshyari.com](https://daneshyari.com)