



Unconventional monetary policy and money demand



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ABSTRACT

This paper investigates the usefulness of the money demand relationship in times of unconventional monetary policies by cointegration methods. Our empirical evidence shows the existence of stable long run money demand functions even in the period of interest rates near the zero bound, both for the US economy and the euro area. Evidence is based on standard monetary aggregates, i.e. MZM for the US and M3 for the euro area. The recent monetary policy shifts towards unconventional measures do not lead to a breakdown of money demand. The relationships do not show instabilities and are robust against the Lucas critique.

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1. Introduction

Prior to the financial crisis the interest rate channel was mainly responsible for the transmission of monetary measures to the real economy. Monetary policy was usually implemented by open market operations to target nominal short term interest rates. Due to price rigidities, central banks implicitly controlled not only the nominal, but also real interest rates over the short and medium runs. Real interest rates affect the decisions of firms to invest and private households to consume. Central banks can also influence the term structure, if long term interest rates reflect the expected compound yield of revolving short term investments. However, the transmission of monetary policy became impaired since the financial crisis. Due to increased uncertainty commercial banks restricted credit to firms. To ease monetary conditions and provide additional liquidity, central banks quickly reduced their policy rates. As a consequence, short term interest rates approached the zero lower bound. The main refinancing rate in the euro area fell from 4.25 in October 2008 to 1 percent in May 2009. The decline has been even more pronounced for the US. The policy rate was reduced from 5.25 percent in July 2007 to 0.15 percent in December 2008.

With short term interest rates at the zero lower bound, central banks lost the conventional instruments to steer the monetary stance and to provide further stimulus to the real economy. Given the existing inflation and output gaps, the standard Taylor rules became obsolete. For example, in order to deliver a degree of future monetary stimulus that was consistent with its past behavior, the Fed would have to reduce the policy rate to minus five percent, well below its lower bound of zero (Rudebusch, 2009).² Therefore, central banks had to switch to unconventional policy measures, see Rudebusch (2009), ECB (2010) and

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² For approaches how Taylor rules should be modified if the zero lower bound is binding see e.g. Belke and Klose (2013).

Fawley and Neely (2013) for recent surveys. While the Federal Reserve raised liquidity mainly by pursuing outright asset purchases of debt and mortgage-backed securities, the ECB responded with additional loans to the banking system and extended the list of eligible collateral banks had to provide. These differences reflect the institutional frameworks under which both the Fed and the ECB operate, i.e. whether the financial and credit system is dominated by capital markets, such as in the US or by banks, as in the euro area.³

The implementation of the unconventional measures constitutes a major shift in the conduct of monetary policy. Changes in policy rules can have an immediate impact on the decisions of forward looking agents as the latter adapt to the expected shift in the policy regime. Since the respective equations might become unstable, any policy analysis based on them may lead to biased conclusions. The Lucas (1976) critique refers to the fact that model parameters might not be constant under different policy regimes. Instead, the parameters are expected to vary, as rational agents are forward looking and might adapt to the expected effects of the new regime. Since the model parameters are based on historical time series, they can be used to evaluate past policy measures. However, they might not be appropriate to forecast future policy impacts.

Previous evidence suggests that the Lucas critique is particularly relevant for monetary policy and financial markets (Clarida et al., 2000). However, several studies argued that the quantitative impact is rather modest (Estrella and Fuhrer, 2003; Rudebusch, 2005). One interpretation of this finding is that past policy changes are not large enough to affect the behavior of agents in a critical way (Leeper and Zha, 2003). In addition, forward looking models appear to be less stable than their backward looking counterparts.

The analysis of money balances can provide valuable information on the transmission of monetary policy, especially in periods when interest rates are already at the zero lower bound. Benchimol and Fourcans (2012, p. 104) conclude from a DSGE model for the euro area that “by changing economic agents perception of risks, the last financial crisis may have increased the role of real money balances in the transmission mechanism and in output changes”. Interest rates are no longer available as a steering instrument. However, the usefulness of money as a policy instrument is conditional to a robust link between the nominal and real side of the economy, as expressed by the money demand function. The money demand relationship links the monetary development to its fundamental determinants, such as the overall price level, real income, financial wealth and the opportunity costs of holding money. By comparing the actual money stock with its long run equilibrium according to money demand, measures of excess liquidity can be extracted to forecast inflation.

Many authors have argued that money demand has become unstable even long before the financial crisis. An additional problem occurs if interest rates are at the zero bound. In this case, the opportunity costs of holding money are zero and agents should be indifferent between holding money or bonds. As a consequence, money demand might break down, see e.g. Reis (2013). However, the existence of a well defined money demand function could not be ruled out in advance, if the opportunity costs are captured by the interest rate spread and/or inflation rates.

In contrast to the other findings, we find evidence in favor of a stable long run money demand function, both for the US and the euro area. The relationships are robust even in the most recent periods when quantitative easing policies are applied by the Fed and the ECB. As shown by tests of superexogeneity, the relationships are robust to the Lucas critique. Therefore, the equations are sufficient to monitor the monetary development. The empirical relevance of the Lucas critique is minor for money demand in times of unconventional monetary policy measures. Overall, the results suggest that money stocks provide useful information and should be considered by central banks to conduct monetary policy.

The rest of the paper is organized as follows: previous findings on money demand are reviewed in Section 2. While the theoretical money demand specification is presented in Section 3, Section 4 is reserved for data issues and the empirical results for the US and the euro area, especially testing for stability of the equations and superexogeneity. Section 5 concludes with some policy implications.

2. Previous studies on money demand

Especially at longer horizons, inflation is inherently a monetary phenomenon (Friedman, 1970). As money defines the unit of account, monetary developments are integral to the determination of prices and inflation. Money and measures of excess liquidity can provide signals for the emergence of speculative bubbles in asset markets with risks to inflation and the real economy (Bussiere and Fratzscher, 2006). Thus, their evolution should be monitored closely by central banks.

The M2 aggregate in the US became the primary intermediate target in the Fed's monetary policy in the 1980s, as the corresponding money demand function as well as money velocity was rather stable up to then (Feldstein and Stock, 1994). Starting from the early 1990s, the reliability of money stocks as indicators for monetary policy has been increasingly called into question, as M2 money demand became unstable. See Duca and VanHoose (2004) for a review of the debate. Financial innovations including the introduction of nonmonetary assets such as stock and bond mutual funds led to unpredictable changes in money velocity. Estrella and Mishkin (1997) concluded that whatever their informational content was in earlier periods, monetary aggregates neither the monetary base nor M2 provide useful information, even not for predicting inflation. Woodford (2008) argued that monetary aggregates should not play any prominent role in the implementation of monetary policy. Given these findings, the Fed downgraded the role of the money stock in the implementation of monetary policy. Monetary aggregates are just viewed

³ The distinction between the Fed and ECB policies became less clear after the end of the sample period (2013), as the ECB decided to launch huge asset purchasing programs. They started in 2015 and will probably last two years.

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