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Optimal central bank lending

Andreas Schabert

University of Cologne, Center for Macroeconomic Research, Albertus-Magnus-Platz, 50923 Cologne, Germany

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Abstract

We analyze optimal monetary policy in a sticky price model with open market operations. The central bank sets the policy rate and can, additionally, control the amount of money by rationing money supplied against eligible securities. Optimal policy under money rationing is shown to enhance welfare in the long-run and in the short-run compared to a conventional optimal policy regime where money supply is not rationed and satiates money demand. Specifically, this property is shown to apply when privately issued debt is eligible in open market operations, which allows the central bank to separately alter costs of borrowing and the size of transactions for which money is required.

JEL classification: E4; E5; E32

Keywords: Optimal monetary policy; Central bank instruments; Collateralized lending; Money rationing

1. Introduction

In the macroeconomic literature of the last two decades, the implementation of monetary policy has focussed on how a risk-free short-term nominal interest rate should be set.[1] Money supply is then passively adjusted by the central bank to satiate money demand, which means that money is supplied until the private agents' marginal valuation of money accords to the marginal costs of holding money in equilibrium. Yet, central banks typically (i.e. in non-crisis times) refrain from

E-mail address: schabert@wiso.uni-koeln.de.

[1] See, e.g., several chapters in [11]. Exceptions are analyses of unconventional monetary policies that are applied in crisis times, like [9,12], or [13].

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fully accommodating money demand, as, for example, the US Federal Reserve "has created what is called a 'structural deficiency'. That is, it has created permanent additions to the supply of reserve balances that are somewhat less than the total need" such that the open market "desk is in a position to add balances temporarily to get to the desired level".[2] Likewise, the European Central Bank has in general not fully accommodated liquidity demand of counterparties by applying "allotment rates" less than one for its main refinancing operations.[3] This indicates that central banks can in fact control both, the nominal interest rate (or, policy rate) as the price of money and the amount of money, by rationing the supply of reserves.[4]

This paper shows that a central bank can enhance welfare by rationing the amount of money supplied in open market operations. Accounting for the fact that reserves are supplied against eligible assets, we consider a collateral constraint for open market operations, where the concept of collateral is used here – like by central banks – in a broader sense and refers to the property of repurchase agreements being a form of collateralized lending. When the central bank supplies money at a price below the marginal valuation of money by private agents, the latter are willing to acquire money against eligible assets until the collateral constraint becomes binding. The policy rate is then decoupled from the marginal rate of intertemporal substitution, which frees up instruments that can change private agents' access to money and interest rates on eligible debt securities. Under money rationing, the central bank can thus control the amount of money as well as interest rates, which allows to separately induce changes in the size of transactions for which money is required and in borrowing costs. Compared to a monetary policy regime that fully accommodates money demand, the central bank can therefore reduce distortionary effects on the allocation more effectively under money rationing simply by having additional instruments at its disposal. This is demonstrated by applying a stylized macroeconomic model, where money rationing is shown to enhance welfare in the long-run and in the short-run.

We examine optimal monetary policy in a framework with frictions that are standard in the literature (see [16,19,6], or [22]). Specifically, we allow for goods prices to be set in an imperfectly flexible way, for transaction frictions (i.e. cash constraints), and for time varying mark-ups. In this framework, we explicitly consider that money is supplied by the central bank only in exchange for eligible assets. Since the latter serve as (imperfect) substitutes for money, the interest rates on eligible debt securities relate to the price of money in open market operations and thus to the policy rate. For assets that are non-eligible, investors then demand interest rates that are higher due to an illiquidity premium.[5] These interest rates relate – as usual – to the nominal marginal rate of intertemporal substitution, which reflects the opportunity costs of money holdings and, therefore, determines the private agents' marginal valuation of money. When the policy rate is set at a lower level, private agents are willing to hold money up to the maximum amount supplied by the central bank against eligible assets, such that money supply is effectively rationed.

Money rationing becomes a relevant option for a welfare maximizing central bank if it cannot implement the first best allocation under a conventional single instrument regime. If, for example, only transaction frictions are present, satiating money demand at zero nominal interest rates implements first best, such that money rationing would be undesirable in this case. If, however,

[2] See Fedpoint "Open Market Operations" at http://www.newyorkfed.org/aboutthefed/fedpoint/fed32.html.

[3] Details on the European Central Bank's allotment rate decisions can be found in [10].

[4] Responses of US Federal Reserve and the European Central Bank to the recent financial crisis, i.e. setting interest rates close to zero and actively expanding the supply of reserves via lending facilities and direct asset purchases, also indicate that central banks can simultaneously control interest rates and the quantity of money.

[5] This is consistent with empirical evidence by [17] on the yield spread between corporate bonds and treasuries.