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Monetary policy and monetary asset substitution ☆

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Abstract

This paper shows that changing the target Federal Funds rate induces changes in relative user costs of monetary assets. Estimated Morishima elasticities of substitution from the Fourier Flexible form reveal greater substitution from transactions assets and savings deposits into small time deposits than into retail money market mutual funds.

Keywords: Monetary asset substitution; Fourier; Federal funds rate

JEL classification: E41; E52; G21

1. Introduction

In recent years, the Federal Reserve has operated monetary policy by changing the target Federal Funds rate. Although changes in the Funds rate generally affect interest rates in the same direction, the magnitude of these interest rate responses differs. Therefore, monetary policy generates changes in relative user costs across monetary assets. Monetary asset substitution in response to these changes can lead to significant movements in deposits, bank reserves, and the composition of reserves. Thus, when designing or evaluating monetary policy, measures of the degree to which bank depositors substitute monetary assets in response to changes in relative user costs provide important information to policymakers.

This paper examines monetary asset substitution in response to Federal Funds rate changes. We use the Morishima elasticities of substitution to account for possible non-symmetric effects. Given that substitution between monetary assets can vary over time, elasticities are estimated from the semi-nonparametric Fourier flexible form.

2. Monetary data

Empirical studies often use seasonally adjusted Federal Reserve data for the components of M2: CUR + DD = currency (including traveler's checks) plus demand deposits; OCD = other checkable deposits; MMDA = savings deposits including money market deposit accounts; STD = small time deposits; and MMMF = retail money market mutual funds. However, these reported data fail to account for retail sweep programs. In January 1994, banks began sweeping funds from DD and OCD into MMDA to avoid holding required reserves. Consequently, we construct sweep-adjusted data to represent the perspective of bank depositors.

The cumulative sum of newly initiated retail sweep programs (CSWEEP) is reported by Anderson (2002). Shares of total swept funds from DD and OCD (denoted by SDD and SOCD) are computed from data that decompose the cumulative amount of swept funds from these transactions deposits.[1] Estimated series for

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[1] We thank Spence Hilton and Dennis Farley for cumulative swept funds data from DD and OCD for 1987:1-2004:1. For 2004:2-2004:8, we set SDD and SOCD equal to their values in 2004:1.

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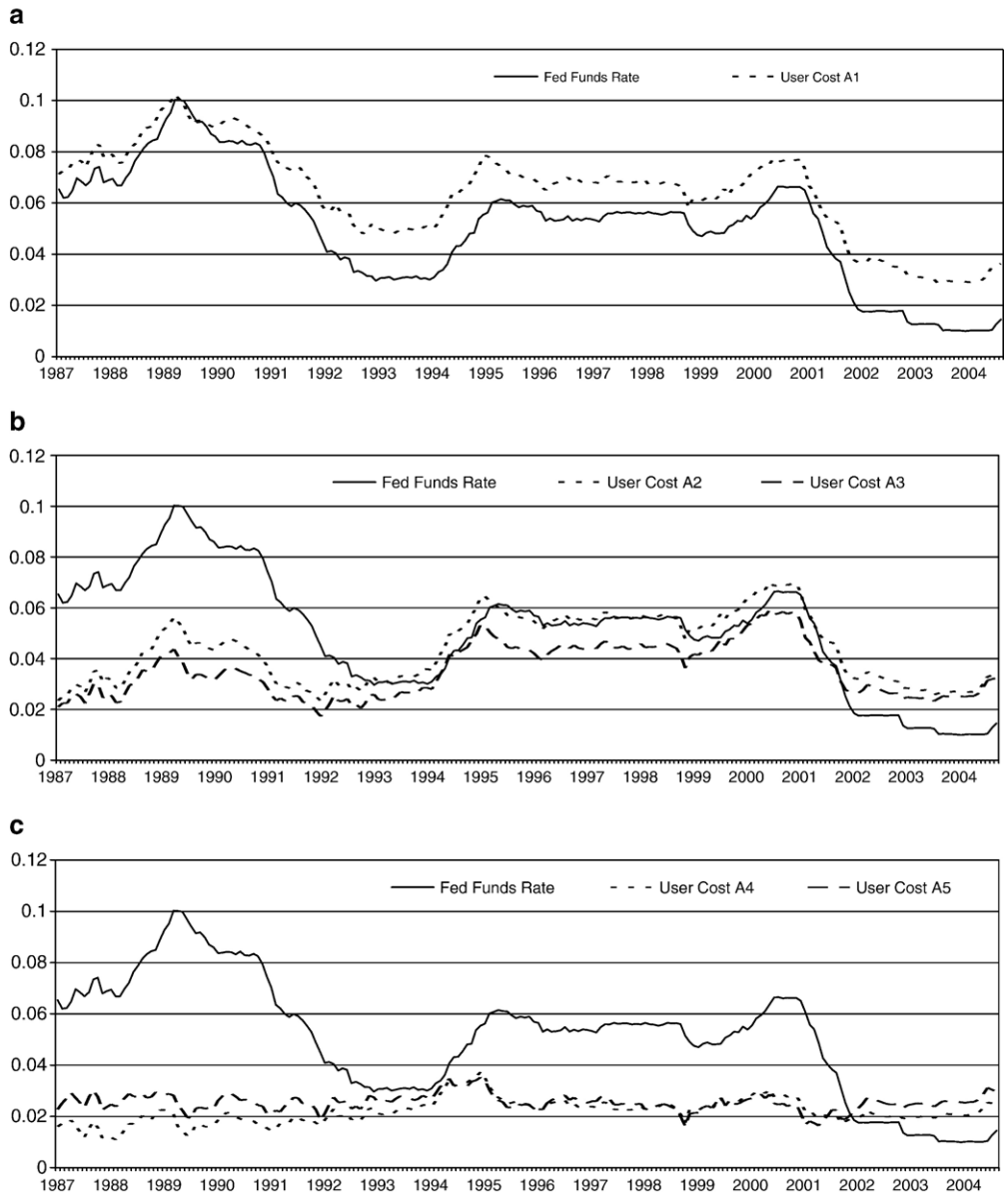

Fig. 1. a: Federal funds rate and the real user cost of A1. b: Federal funds rate and the real user costs of A2 and A3. c: Federal funds rate and real user costs of A4 and A5.

funds swept from DD and OCD are calculated as SWEEP_DD = SDD * CSWEEP and SWEEP_OCD = SOCDD * CSWEEP.

We adjust the reported data by subtracting estimated swept funds from MMDA and adding them to DD and OCD, as in Jones et al. (2005). Nominal assets are deflated using the personal consumption expenditure chained price index. In real terms, the monetary assets are:

$$\begin{aligned} A1 &= CUR + DD + SWEEP\_DD, \\ A2 &= OCD + SWEEP\_OCD, \\ A3 &= MMDA - (SWEEP\_DD + SWEEP\_OCD), \\ A4 &= STD, \\ A5 &= MMMF. \end{aligned}$$

The real user costs are $\pi_i=(R-r_i)/(1+R)$, where R is the interest rate on the benchmark asset and r_i is the own rate on the ith asset, for $i=1,2,3,4,5$ (Barnett, 1978). For OCD, MMDA, STD, and MMMF, r_i come from the Federal Reserve Bank of St. Louis. Since swept funds are invisible to the customer, r_i for OCD and MMDA are used for A2 and A3 and $r_1=0$. The 6 month Treasury bill rate serves as R, as Barnett (2003) and Stracca (2004) argue against using a long-term rate as the benchmark.[2] All interest rates are converted to a one month yield on a bond interest basis. The monthly data cover 1987:1-2004:8, the post-Regulation Q era of unregulated bank interest rates.

3. Morishima elasticity and the Fourier flexible form

In models with three or more assets, Blackorby and Russell (1989) show that the correct measure of substitution is the

[2] To ensure non-negative user costs, we add 200 basis points to the benchmark rate as in Fisher et al. (1993).