

Liquidity management and overnight rate calendar effects: Evidence from German banks

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Abstract

We document a general pattern in the euro area overnight interbank rate (EONIA) and analyze how German banks compared to other EMU banks respond to these predictable changes in the price for reserve holdings. At the beginning of the maintenance period, when the EONIA is typically above average, we observe that German banks hold substantially less reserves than their daily average required reserves. Thus in contrast to other EMU banks, German banks back load the fulfillment of their reserve requirements over the reserve maintenance period and thereby benefit from the general pattern in the EONIA. Looking at the disaggregate data we find that this is particularly the case for the Landesbanks. We argue that the end of the calendar month effect in the EONIA may be driven by a temporary shortage of liquidity, relative to reserve requirements, at the beginning of the maintenance period (which coincides with the end of the calendar month).

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1. Introduction

It is well documented that there are calendar effects in overnight rates in the euro area Hartmann, Manna, and Manzanares (2001), Perez-Quiros and Rodriguez (2006), Bindeseil, Weller, and Wuertz (2003), Nautz and Offermanns (2006) as well as in the US Hamilton (1996), Bartolini,

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Bertola, and Prati (2001), and Furfine (2000). For example, the EONIA (euro overnight index average) is systematically higher towards the end of the month than at other times Bindseil et al. (2003). This raises two issues. First, to what extent do banks adapt their liquidity management to these systematic calendar effects? Second, why does the overnight rate not follow a martingale; why are the higher end of month rates in the euro area not arbitrated away? In this paper, we shed light on these issues by studying the time pattern of reserve holdings of German banks within the reserve maintenance period, i.e. within the period in which banks have to fulfill their minimum reserve requirements.

The existence of calendar effects in the EONIA is arguably surprising in light of the principles behind monetary policy implementation in the euro area. First, reserve requirements in the euro area are set at levels which are substantially larger than the demand for working balances European Central Bank (2002). Second, reserve holdings at different days within the reserve maintenance period contribute equally to the fulfillment of reserves requirements, since banks need only to meet reserve requirements as a daily average over the reserve maintenance period. Third, the ECB has a liquidity neutral policy, that is, it aims to inject, through its refinancing operations, exactly the amount of central bank money that banks need in aggregate to meet their liquidity needs, including satisfying reserve requirements. Finally, remuneration on reserves held with the ESCB (European system of central banks) is the same for all days within the same maintenance period. Thus there is no apparent reason why the EONIA, or the demand for liquidity, should follow a systematic pattern over the maintenance period.¹

To examine how banks respond to time patterns in the EONIA, we use two sets of data relating to the fulfillment of reserves. First, we have the aggregate reserve holdings of German and all European Monetary Union (EMU) banks on a daily basis from 06/2000 to 12/2001. This permits us to contrast the liquidity management of German banks with the rest of Europe. Second, over the same time period, we have the marginal and cumulative reserve holdings of each individual German bank at each day before one of the ECB's weekly main refinancing operation. Thus, we can study differences in liquidity management across different bank types. German banks are particularly interesting to study since they account for the largest share of the euro area banking sector, and they are commonly viewed as acting as interbank intermediaries in the market for liquidity in the euro area.²

Since the EONIA typically increases towards the end of the calendar month, efficient liquidity management should involve relatively low reserve fulfillment during this time. Since the reserve maintenance period during the sample period runs from the 24th of a month until the 23rd of the next, the end of month increase in the EONIA coincides with the first week of the maintenance period. Thus, typically, efficient liquidity management involves the holding of less reserves than the average daily required amount during the beginning of the maintenance period.

Using the aggregate reserve fulfillment dataset, we find that German banks have on average lower fulfillment ratios (cumulative reserve holdings within the maintenance period as a

¹ The ECB operates with a system of lending and deposit facilities that are 100 basis points above and below, respectively, the minimum bid rate in the ECB's main refinancing operations. Thus, assuming that there are no expectations of rate changes, if the probabilities that the ECB injects too much or too little liquidity are equal, this means that the overnight rate should be the average of the lending and deposit rates throughout the reserve maintenance period. More generally, this system should assure that the overnight rate follows a martingale, assuming no imperfections in the market for overnight money (see, e.g., Bindseil et al. (2003)).

² See Deutsche Bundesbank (2004).

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