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Japanese repo and call markets before, during, and emerging from the financial crisis[☆]



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ABSTRACT

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We empirically investigate the relationship between the Japanese general collateral (GC) repurchase agreement (repo) and uncollateralized call rates before, during, and emerging from the recent financial crisis. Unlike the US and many other countries, the Japanese GC repo rate had been higher than the uncollateralized call rate, despite the former being secured by collateral. Moreover, during the financial crisis, the Japanese GC repo rate rose, whereas the US Treasury GC repo rate decreased. The results of our empirical analysis suggest that segmentation between the Japanese repo and call markets was an important factor in explaining these features. Our results also imply that the Bank of Japan's policy actions during and after the financial crisis were effective to some extent in lowering both the repo and call rates, and stabilizing the relationship between them. *J. Japanese Int. Economies* 39 (2016) 17–34. International Monetary Fund, 700 19th Street, NW, Washington, DC 20431, United States; Bank of Japan, Japan.

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1. Introduction

The first step in the monetary policy transmission process in normal times is the link across short-term funding markets, whereby a change in the target policy rate, such as the federal funds rate in the US, is immediately propagated to other short-term interest rates. However, during the recent financial crisis starting in 2007, short-term funding markets, including repurchase agreement (repo) markets, became strained in many developed countries because of heightened concerns about counterparty credit risk and greater uncertainty about the value of collateral, and as a result, the links between the policy and repo rates weakened considerably. Furthermore, after policy rates were cut to near-zero levels in many developed countries and no longer acted as the main tool of monetary policy, the links with repo rates ceased to serve as part of the monetary policy transmission process.

The purpose of this paper is to investigate empirically the relationship between the repo rate and the policy rate, that is, the uncollateralized overnight call rate, in Japan. Although the Bank of Japan has adopted a zero-interest-rate policy since the late 1990s, which corresponded to an early stage of development in Japan's repo markets, the repo and call rates appeared to be still closely linked when the interest rate policy were intermittently normalized, especially between mid-2006 and late 2008. Besides that, we observe some unique features in the relationship between repo and call rates in Japan. Unlike the US and many other countries, at least in the normalized (not zero-interest-rate policy) periods, the Japanese general collateral (GC) repo rate had been higher than the uncollateralized call rate, despite the former being secured by collateral. Moreover, during the financial crisis, the Japanese GC repo rate rose, whereas the US Treasury GC repo rate decreased because of a "flight to quality." After we briefly discuss these features in the relationship between Japanese repo and call rates, we quantitatively examine the relationship between two rates by conducting a formal empirical analysis following [Bech et al. \(2012\)](#), who examined the relationship between the US Treasury GC repo and federal funds rates before, during, and emerging from the financial crisis using a vector error correction model.

Our results suggest that segmentation between the Japanese repo and call markets was an important factor in explaining the above features in the relationship between the two rates. In particular, during the financial crisis, the larger presence of foreign financial institutions in the repo market relative to the call market led to a rise in the repo rate, rather than a decrease, in response to a distress in foreign currency short-term funding markets. At the same time, our results also imply that the Bank of Japan's policy actions during and after the financial crisis were effective to some extent in lowering both the repo and call rates, and stabilizing the relationship between them. Meanwhile, our results on the effects of institutional changes in the payment system on the two rates are mixed and unclear.

Since the outbreak of the financial crisis, many studies have investigated the relationship among short-term funding markets and the effects of monetary policy on these markets in both the US and Europe. Other than [Bech et al. \(2012\)](#); [Marquez et al. \(2013\)](#) examined the interplay between the US Federal Reserve's balance sheet and overnight interest rates, while [Mancini et al. \(2016\)](#) conducted empirical analysis of the euro interbank repo market. However, there are far fewer analyses of Japanese short-term funding markets, partly because market trading and functioning have long been paralyzed, at least to some extent, by the zero-interest-rate policy since the late 1990s. Regarding the call market, [Hayashi \(2001\)](#) and [Uesugi \(2002\)](#) examined the relationship between the call rate and reserve balances. This so-called "liquidity effect" is also examined in our empirical analysis. As for the repo market, [Baba and Inamura \(2004\)](#) examined the pricing mechanism of the Japanese repo market, focusing on the linkage between the repo and government bond markets. To the best of our knowledge, however, no previous study has conducted an empirical analysis focusing on the relationship between the Japanese repo and call rates.¹

¹ Other existing studies on Japanese short-term funding markets include [Saito et al. \(2005\)](#), who examined the effects of seasonal liquidity demand arising from periodic payment practice on the yield curves of Japanese money market rates, [Fukuda \(2011\)](#), who examined the spreads between the intraday high and low of the call rate in the zero interest rate period and the quantitative easing period, [Fukuda \(2012\)](#), who examined the relationship between the Tokyo Interbank Offered Rate (Tibor) and the London Interbank Offered Rate (Libor) during the global financial crisis, and [Hirose et al. \(2012\)](#), who examined the effects of the Bank of Japan's liquidity provisions on the year-end premium on money market rates.

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