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# The impact of the global financial crisis on the cross-currency linkage of LIBOR–OIS spreads<sup>☆</sup>

Philip Inyeob Ji<sup>\*</sup>, Francis In

Department of Accounting and Finance, Monash University, Clayton, VIC 3800, Australia

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### ABSTRACT

This article examines the impact of global financial crisis on cross-currency linkage of the LIBOR–OIS spread, a financial stress measure in interbank markets. The impulse response analysis is conducted in a multivariate setting, adopting the bias-corrected bootstrap as a means of statistical inference. The overall evidence suggests that the crisis has substantially changed the nature of the cross-currency interactions in liquidity stress. Also global money markets have failed to contain stress in US dollar funding and the role of the Japanese yen as a liquidity source appears to be significant, while these two currencies drive the cross-currency system of liquidity stress.

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## 1. Introduction

The global financial crisis has been an unprecedented event threatening the stability of the global financial markets. The impact of the crisis is still settling in financial markets around the world and few are optimistic of the aftermath. Already a housing bubble has burst and international stock market indices have experienced record hitting declines. Another associated phenomenon is the dramatic increase, over the course of the crisis, in the spread between the London interbank offer rate (LIBOR) and the overnight indexed swap (OIS), a matter of vigilant interest, for not only monetary authorities but also market participants. This is because the LIBOR–OIS spread is one of the widely accepted key measures of financial stress, along with credit default swap prices, the spread between the eurodollar

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<sup>\*</sup> Corresponding author. Tel.: +61 3 9905 2373; fax: +61 3 9905 5475.

E-mail address: [Philip.ji@buseco.monash.edu.au](mailto:Philip.ji@buseco.monash.edu.au) (P.I. Ji).

rate and T-bill yield, and the spread between T-bill yield and the OIS (for details, see Brunnermeier, 2008; Mizen, 2008; Taylor and Williams, 2009). Alan Greenspan quotes on the importance of the spread.<sup>1</sup>

“LIBOR–OIS remains a barometer of fears of bank insolvency.”

In fact there have been discussions among many academics and practitioners on whether the LIBOR–OIS spreads gauge liquidity stress or counterparty risk (see, for example, Michaud and Upper, 2008; Taylor and Williams, 2008, 2009; Thornton, 2009). Some argue that the spread better represents liquidity stress rather than credit risk. The argument is that banks become reluctant to lend due to uncertainty of their own future need for funds or risk in their balance sheet. Others who favor counterparty risk note high correlations between LIBOR and CD (Certificate of Deposit) rates, and interpret this evidence to argue that borrowers of the same credit standing eventually face the same rates in both liquidity-unconstrained CD markets and liquidity-constrained interbank markets. But von Thadden (1999) quotes “the definition of liquidity is elusive” to claim that the distinction between liquidity stress and credit risk is unclear and that, particularly in the case of financial institutions.

Moreover, as a metric of liquidity and credit pressures, the LIBOR–OIS spread is particularly important in highly securitized modern financial environments.<sup>2</sup> Current banking practice extensively uses the so-called “originate and distribute” model, which involves a vast amount of securitization.<sup>3</sup> The benefits of securitization are the enhancement of liquidity and the efficient usage of credit in capital markets, which measures like the LIBOR–OIS spread capture. However, to the best of our knowledge, little attention has been paid to the spread in the financial economic literature. Some recent works that use the spread include McAndrews et al. (2008), Taylor and Williams (2009), and In et al. (2008). A common theme of these papers is the impact of the Term Auction Facility (TAF) on the LIBOR–OIS spread. As the LIBOR–OIS spread had been widening rapidly since August 2007, the Federal Reserve introduced the TAF to ease liquidity strains and reduce the spread in December 2007. McAndrews et al. (2008) present empirical results to advocate the efficacy of the TAF, whereas Taylor and Williams (2009) conduct empirical tests but obtain no evidence of the TAF’s effectiveness. In et al. (2008) consider whether a psychological effect exists on the spread in a time period between the bid submission date and the actual timing of liquidity injection.<sup>4</sup>

Since recent financial woes are not limited to the United States, this study examines the cross-currency linkage of LIBOR–OIS spreads in major currencies including the Australian dollar, the British pound, the European euro, the Japanese yen, and the US dollar. An earlier work on the cross-currency linkage of the spreads is Imakubo et al. (2008) who notice co-movements in the spreads for the US dollar, euro and Japanese yen. The authors first decompose the spreads into credit risk and liquidity stress by showing the movements in the spread only weakly correlated with credit premium estimates from credit default swaps (CDS). They also argue that in the cross-currency context the spread better represents liquidity stress than credit risk, based on the reasoning that internationally active banks should pay for the same credit risk in all currencies and the LIBOR panels are similar across currencies. Michaud and Upper (2008) argue similarly for the role of the spread. Another support for the liquidity stress is offered by Schwarz (2009) who finds that both risks are contained in the spreads but liquidity stress portion weighs more than two-third of the widening of the euro spread. Since the focus of this paper is placed on a cross-currency analysis, the liquidity stress appears to be appropriate for interpretational purposes.

Imakubo et al. (2008) utilize vector autoregressive (VAR) models to examine the interdependence of these spreads. Conventional benefits of the VAR models, variance decompositions, causality tests, and impulse responses, are employed to show that the cross-currency transmission mechanism of interbank liquidity stress has changed and the stress has become highly correlated across currencies

<sup>1</sup> See Thornton (2009) for further references.

<sup>2</sup> For example, in the United States during the first half of 2007, \$652.3 billion of asset-backed securities were issued.

<sup>3</sup> See Brunnermeier (2008) for an overview of modern banking practice and a summary of the main events of the credit crunch in 2007 and 2008.

<sup>4</sup> The authors find that TAF has a clear initial effect on the 3-month LIBOR–OIS spread but no sustained effect. In addition, TAF has no effect on the 1-month LIBOR–OIS spread, casting further doubt on the usefulness of TAF for reducing risk spreads.

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