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What moves benchmark money market rates? Evidence from the BBSW market

Lorenzo Casavecchia[a], Geoffrey F. Loudon[a], Eliza Wu[b,*]

[a] Macquarie University, Australia
[b] University of Sydney Business School, Australia

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ABSTRACT

In this study we examine the daily movements of a benchmark interest rate using the bank bill swap rate (BBSW) over the period from 2006 to 2016. By decomposing the BBSW into its credit risk and liquidity risk components we reveal that the relative importance of these priced components are conditional on economic uncertainty. Although the compensation required for credit risk increased markedly during the period 2007–2009, the liquidity risk component exerted a disproportionately stronger effect on short-term BBSW spreads relative to credit risk. Our findings show that using a market-based approach to setting credit-based benchmark interest rates introduces both a liquidity and credit risk premia into benchmark interest rates, and both of these risk premia are affected by market forces.

1. Introduction

The setting of benchmark interest rates has received much attention from policy makers, financial market participants and academics since reports of rate rigging have come to light with regards to the setting of the LIBOR in the UK and BBSW in Australia. The interbank money market serves as an important conduit for banks within a financial system to manage interbank liquidity. These benchmark rates are also extensively applied in pricing financial contracts in the interest rate derivative market, and in the calculation of payments on hundreds of billions of dollars of securities, mortgages and corporate loans as the rates on these are typically priced as a spread relative to the interest rate benchmark. Despite their importance within financial markets, the influence of credit and liquidity risk factors in these uniquely market-determined credit-based benchmark rates over time is not well understood, especially in times of economic uncertainty.

The Bank Bill Swap rates (BBSW) are unique credit-based reference benchmark interest rates in the Australian market. These rates are commonly used by large prime banks as the reference rate to trade wholesale funds on an unsecured basis between themselves on the interbank market via short-term bank bills for various tenors. BBSW rates were compiled by the Australian Financial Markets Association (AFMA) up until January 2017 from approved trading venues every business day at and around 10:00 am, and are computed as the midpoint of the nationally observed best bid and best offer (NBBO) for prime bank eligible securities with maturity

* Corresponding author.
E-mail address: eliza.wu@Sydney.edu.au (E. Wu).

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of between one and six months (primary calculation mechanism).[1] Prime eligible securities comprise bank accepted bills (BABs) and negotiable certificates of deposit (NCDs) issued by Australian prime banks.[2] The daily market-based rate setting mechanism used in the BBSW market in Australia to determine the BBSW rate at which transactions for prime eligible securities will take place provides an alternative laboratory for studying the sensitivity of these priced components in credit-referenced benchmark interest rates as these interest rate components have previously been identified in the pricing of longer-term corporate bonds (see for example, Shin and Kim, 2015) but are empirically difficult to capture when modelling shorter-term interbank money markets that are thought to be 'near risk-free' in stable times.

There is relatively scant empirical evidence on the determinants of banks' wholesale unsecured funding costs, particularly within a smaller and more domestically orientated and transparent money market like that existing in Australia. As the benchmark interest rates are transaction based and the rate is set at a set time on a daily basis based on the demand and supply forces in the underlying market for unsecured bank borrowing, the market forces are likely to impose even greater disruptions in times of financial market turmoil. It is critical to understand the driving forces in these markets as they serve as barometers on the financial health of any economy and can change abruptly in times of financial crises (Taylor and Williams, 2009; Gefang et al., 2010; Olsen et al., 2012).

In this study, we focus on 3 key research questions: What is the likely impact of credit risk and liquidity premia on the time series variation of BBSW at different tenors? Is the divergence of spreads at longer terms from those at shorter terms suggestive of changing liquidity conditions in the interbank market? What are the determinants of these credit and liquidity risks? To the best of our knowledge we are not aware of any study that has comprehensively investigated the counterparty risk and market and funding liquidity components of such money market benchmark rates at different tenors. This is an issue of particular interest to market participants and regulators alike as these benchmark interest rates are critical to the plumbing of any financial system.

To understand the driving forces of the movement of BBSW, we decompose the risk premia contained in BBSW rates into two key factors, which are counterparty credit risk premium (CRDRISK) and liquidity risk premium (LIQHOARD). As banks' funding liquidity (i.e., liquidity premium) cannot be directly observed, following prior studies like McAndrews et al. (2008) and Remolona et al. (2008), we first derive a credit risk premium for the Australian interbank market by using the prices of credit default swaps (CDS spreads) for the four AFMA eligible prime banks and hypothesizing a very conservative recovery rate of 40% given default. We then assume that BBSW rate (in excess of the OIS rate) is comprised of only credit and liquidity components. Hence, the difference between the excess BBSW rate and our estimated credit premium (CRDRISK) represents the residual liquidity component (LIQHOARD). To further investigate the determinants of the liquidity component, we use a set of proxies, which are derived from trading data and disclosures of the Reserve Bank of Australia (RBA), to measure funding liquidity and market liquidity. We find that funding liquidity plays a more important role than market liquidity in determining liquidity risk component of BBSW rates. For the credit risk component, we not only examine the minimum set of determinants indicated by previous research, which are financial leverage, firm-specific volatility and the slope of the yield curve, we also control for the volatility level of CDS premia and the uncertainty of the market expectations about banks' earnings. Overall, the structural determinants of the credit risk premium are consistent with those identified theoretically (see for example, Heider et al., 2015 and references therein). Our results are robust to the inclusion of time fixed effects and the first difference estimation.

In general, we find that both liquidity and credit risk drive movements in the BBSW over time as these are effectively short term interest rates on market- and credit-based instruments. However, the relative importance of these priced components are conditional on economic uncertainty, with the liquidity premium being the main fluctuating economic driver of the BBSW spread and credit risk being a more stable and constant low key driver. Moreover, the compensation required for credit risk significantly increased during the midst of the tumultuous 2007–2009 period but under normal market conditions the liquidity components play a more dominant role in driving short-term BBSW movements. This is an important result which delineates from the extant literature that has focused on other international reference benchmark rates or interest rate spreads in the absence of either implicit or explicit government protection on banks operating in these interbank markets. In Australia, in the height of the 2008 Global Financial Crisis (GFC), the Australian government introduced a guarantee on large deposits and wholesale debt that was utilized by the domestic prime banks that also operated in the BBSW market (see Luong et al., 2017 and references therein for further details). Our empirical evidence, consistent with Bollen et al.'s (2015) study on Australian bank risk through the GFC indicates that market perceptions of bank risks changed when the government explicitly provided guarantees on banks' public debt and we find as a result of this counterparty risk became relatively less of a concern in the interbank market during 2008. Our empirical results imply that using a market transaction approach to setting credit-based benchmark interest rates introduces both a liquidity and credit risk premia into benchmark rates and both are subject to changing market forces and fluctuate over time especially in response to economic uncertainty.

A better understanding of the economic factors that influence the behavior of BBSW is important for several reasons. First, since these benchmark rates are used at different maturities as default reference rates, an increase in the BBSW term premia would not only affect the liquidity of many classes of fixed income and derivative contracts but also reduce real-sector investments. Second, there has been a decline over recent years in the turnover of prime bank paper used to calculate BBSW as banks have gradually pulled back from interbank transactions fearing possible allegations of rate rigging. The decreasing turnover in the interbank market raises

[1] AFMA eligible prime banks include the following four major Australian banks: Commonwealth Bank of Australia, Westpac, ANZ Banking Group, and National Australia Bank. Prior to 27 September 2013, the BBSW was calculated as the trimmed average of mid-rates observed by 14 survey panelists at 10 am each business day before the operational change to using the midpoint of the NBBO rates. The administration of the BBSW market was transferred to the Australian Securities Exchange (ASX) from the beginning of 2017, beyond the end of our sample period.

[2] In normal market conditions eligible prime banks must post bids and offers across all the tenors included in the BBSW benchmark calculation at a maximum spread of 3 basis points for tenors of one, three and six months, and 4 basis points for tenors of two, four and five months.