

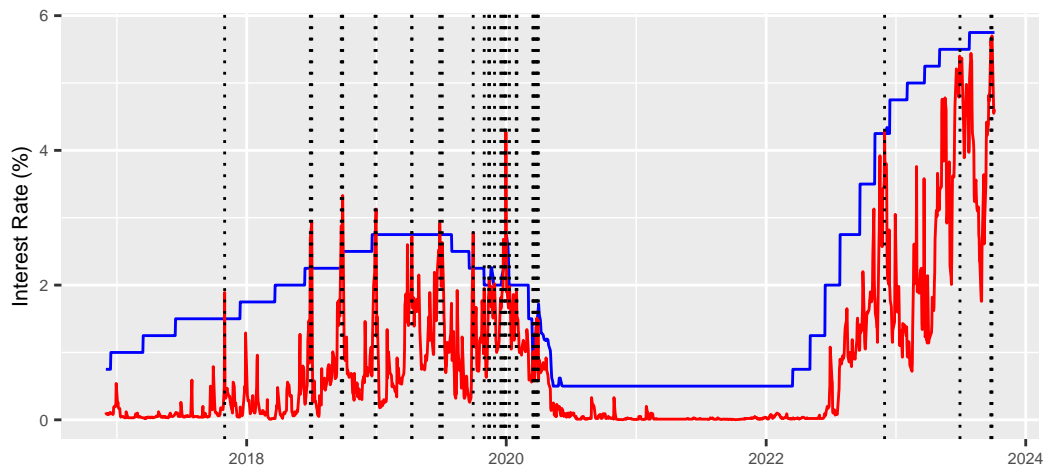
What Is the Cause of Interest Rate Volatility in Interbank Markets?

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The Hong Kong Interbank Offering Rate (HIBOR), the city's benchmark rate, often breaches the Base Rate, which is the interest rate at which the Hong Kong Monetary Authority (HKMA) lends.¹ This should not happen, as the Base Rate theoretically sets a ceiling on the HIBOR.² A bank seeking HKD should have no reason to borrow from a lender that charges more than the HKMA. This memo investigates why this is the case, before recommending a policy response.

Fig. 1 HIBOR, Base Rate, and Dates of Spikes



The Hong Kong Dollar Overnight Index Average (HONIA, an effective HKD rate of borrowing derived from volume-weighted overnight borrowing data) is plotted in red against the Base Rate (blue), which is referred to as the ceiling rate in this memo. Black dotted lines underscore days where HONIA exceeded the ceiling rate. Though HIBOR is still common parlance in local markets, financial markets have begun a transition away from HIBOR to HONIA since 2020. HIBOR and HONIA data published by the HKMA.

¹This has previously been proposed in Olivier Armantier and Charles A. Holt, “Overcoming Discount Window Stigma: An Experimental Investigation”, *The Review of Financial Studies* 33 (2020), pp. 5630-59; and Mehdi Beyhaghi and Jeffrey R. Gerlach, “How Banking Supervision Hinders the Federal Reserve’s Mission as the Lender of Last Resort”, SSRN (26 Aug 2022).

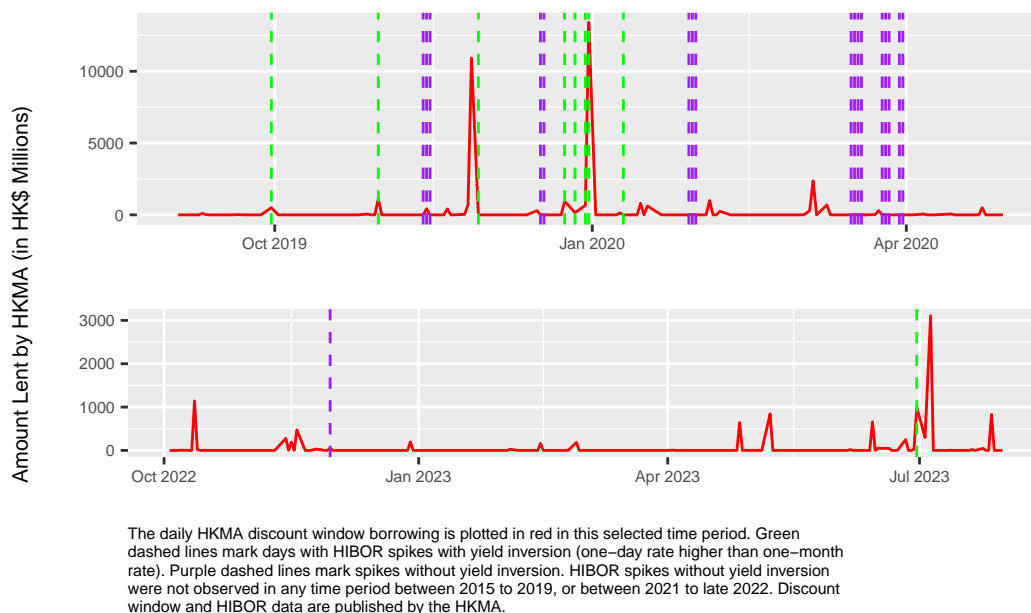
²Yes, the interest rate ceiling is called the Base Rate. Economists are not good at names.

It's stigma, not IPOs

The common explanation offered for HIBOR spikes is initial public offerings (IPOs). Hong Kong is a common destination for companies to list their shares to raise funds. When an IPO closes, investors who successfully purchase shares must collectively make transfers to the fundraiser on the same day, during which the city's banks may borrow cash in large quantities to make payments;³ accessing the discount window may be insufficient either in terms of amount or timeliness.⁴ Purchasers must therefore make borrowing arrangements in the interbank market, pushing up interbank interest rates.⁵

But I found that breaches occur even during days when there were no IPOs.⁶ This is confirmed by further analysis: IPOs usually cause short-term rates to rise above long-term ones (leading to an “inverted yield curve”).⁷ But no inversion occurred during 18 of the 39 HIBOR spikes observed between 2019-23, i.e., borrowing costs for different maturities increased in tandem (Figure 2, purple dashed lines), which suggests IPOs were not the cause.

Fig. 2 Amount Borrowed From Discount Window and Dates of Spikes



The most damning evidence is as follows: IPO activity is supposed to highly correlate with amounts borrowed from the HKMA. But as Figure 2 shows, HIBOR spikes which did not lead to inversion also happened to coincide with dampened borrowing (note how borrowing ticks up around green dashed lines but not purple). This means that, for half the sample, not only do we *not* see the positive correlation that we would expect between

³Frank Leung and Philip Ng, “Impact of IPO activities on the Hong Kong-dollar interbank market”, Hong Kong Monetary Authority Quarterly Bulletin, Sep 2008, pp. 1-9.

⁴Arranging a discount window loan requires calling the HKMA’s dealing room. [https://www.hkma.gov.hk/media/eng/doc/key-functions/monetary-stability/liquidity-facilities/Operational_Note_\(English\)_Liquidity_Facilities_Framework\(final\).pdf](https://www.hkma.gov.hk/media/eng/doc/key-functions/monetary-stability/liquidity-facilities/Operational_Note_(English)_Liquidity_Facilities_Framework(final).pdf)

⁵Leung and Ng, “Impact of IPO activities”, pp. 1-2.

⁶HKEX, New Listing Report: Main Board and GEM, https://www2.hkexnews.hk/new-listings/new-listing-information/main-board?sc_lang=en.

⁷Leung and Ng, “Impact of IPO activities”, p. 6.

observed HIBOR spikes and borrowing (as the IPO hypothesis would suggest), we in fact see negative correlation.

Table 1 confirms this point: Column 1 shows that deviations of HIBOR from the Base Rate is highly predictive of the amount borrowed from the HKMA. (The dataset includes 26 days, which are those during which the Base Rate was breached.) Column 2 considers whether that day also saw an inverted yield curve (a binary variable) and the interaction between these two predictors. As suspected, banks only use the discount window if (i) HIBOR deviates from the Base Rate and (ii) there is yield inversion, which for our purposes signify the presence of an IPO. When only (i) is true, there is less willingness to borrow from the central bank.

All observations point to discount window stigma as the cause for interest rate spikes. Stigma exists because utilizing the HKMA's lending programs might suggest to investors that the borrowing bank is unable to convince other banks to lend. Investors could in turn assume that the bank is financially distressed and divest. In the US interbank lending market, stigma exists despite that access of the Fed's lending program is kept confidential, leading scholars to speculate that the interconnectedness of interbank markets allows participants to infer the borrower's identity.⁸

Table 1: Discount Window Borrowing on HIBOR Spikes and Yield Inversion

	Billions HKD Borrowed from Discount Window	
	(1)	(2)
Deviation from Base Rate	5.909*** (0.486)	0.387 (1.830)
Yield Inversion		-1.071** (0.466)
Deviation from Base Rate*Yield Inversion		5.974*** (1.891)
Constant	-0.825*** (0.221)	-0.026 (0.323)
Observations	29	29
R ²	0.845	0.890
Adjusted R ²	0.840	0.877
Residual Std. Error	0.994 (df = 27)	0.872 (df = 25)
F Statistic	147.693*** (df = 1; 27)	67.438*** (df = 3; 25)
<i>Note:</i>		*p<0.1; **p<0.05; ***p<0.01

⁸Olivier Armantier, Eric Ghysels, Asani Sarkar, and Jeffrey Shrader, "Discount window stigma during the 2007–2008 financial crisis", *Journal of Financial Economics* 118 (2015), pp. 317–35. Beyhaghi and Gerlach, "How Banking Supervision Hinders the Federal Reserve's Mission as the Lender of Last Resort", p. 28.

The only solution to discount window stigma

To address discount window stigma, the HKMA should institute **randomized mandatory borrowing**.⁹ Under the policy, the HKMA would unilaterally make short-term deposits of sufficiently large amounts, with regular frequency but at randomly varying times, to randomized recipients each time. The objective of the policy is to regularize usage of the HKMA’s lending program, while making it no longer possible for the market to connect the program’s usage with insolvency, as borrowing could be involuntarily initiated.

Randomized mandatory borrowing would be more effective than two alternatives. The first is increasing discount window opacity. The Fed currently does not disclose borrower identity for two years, yet discount window stigma still exists among US banks. The second is lowering the Base Rate: similar cuts by the Fed failed to stimulate discount window usage in the wake of the ’08 Financial Crisis.¹⁰

Less mortgage overpayment and more productive investing

The foremost benefit to a destigmatized discount window would be to save homeowners money. Overnight yield spikes can drive a parallel shift in the yield curve. Given that most mortgages in Hong Kong reference the one-month HIBOR, homeowners overpay interest whenever the HIBOR spikes above the HKMA’s target. There were 18 days between 2019-23 with upward-sloping yield curves and HIBOR breaches simultaneously. I estimated that mortgage borrowers overpaid between US\$0.5 million and US\$173 million in interest over 18 days alone.¹¹

There are potential benefits to financial actors as well. Experimental evidence shows that although such a policy would cost liquid banks due to additional interest paid, it would also benefit both solvent banks undergoing illiquidity through lower borrowing costs and equity holders, who would no longer be able to unproductively discriminate against solvent

⁹This has previously been proposed in Olivier Armantier and Charles A. Holt, ‘Overcoming Discount Window Stigma: An Experimental Investigation’, *The Review of Financial Studies* 33 (2020), pp. 5630-59; and Mehdi Beyhaghi and Jeffrey R. Gerlach, ‘How Banking Supervision Hinders the Federal Reserve’s Mission as the Lender of Last Resort’, SSRN (26 Aug 2022).

¹⁰Olivier Armantier, Eric Ghysels, Asani Sarkar, and Jeffrey Shrader, ‘Discount window stigma during the 2007–2008 financial crisis’, *Journal of Financial Economics* 118 (2015), pp. 317-35.

¹¹Spikes are defined as ‘mortgage-affecting’ if yields did not invert on the day of the spike. The low-end estimation is made by multiplying the volume of mortgages outstanding on the day by the percentage of new mortgages which refer to the HIBOR (this operation gives an approximation of total HIBOR-referencing mortgages outstanding), which is then multiplied by the deviation between one-day HIBOR (measured by HONIA) and the HKMA’s ceiling rate. The ceiling rate of the HKMA is for one-day borrowing only, so we can only approximate how this ceiling on one-day borrowing would restrict the one-month borrowing cost. This method assumes that deviations for daily and monthly rates are identical. The high-end estimate of rate deviation is computed as the difference between the one-month HIBOR and the OBFR (the latter compounded to one month in arrears). The limitation of this method is that the one-month rate in Hong Kong can deviate from the US’s due to various factors, such as overall banking system liquidity and terms of trade. Not to mention that while compounding in arrears is consistent with post-LIBOR transition conventions, it fails to account for a (likely) upward-sloping yield curve in US markets. I assume that outstanding mortgages whose repayment is due on each working day of the month is equal. HKD figures are converted to USD at a rate of 7.8 HKD per USD. Monthly mortgage data is published by the HKMA on <https://www.hkma.gov.hk/eng/data-publications-and-research/data-and-statistics/monthly-statistical-bulletin/>.

banks using the discount window.¹² A destigmatized discount window would create net welfare gain; stable interest rates would do more good than harm.

¹²Olivier Armantier and Charles A. Holt, “Overcoming Discount Window Stigma: An Experimental Investigation”, *The Review of Financial Studies* 33 (2020), pp. 5630-59.