



THE IMPACT OF FUTURE INITIAL PUBLIC OFFERINGS ON HIBORS

Key points:

- *As a leading financial centre with highly developed infrastructure and a global network, Hong Kong is a hub for major offshore fund-raising, especially for initial public offerings (IPOs).*
- *It is well-known that IPO subscriptions exert sizeable pressure on short-term HIBORs. What is less known is the extent to which future IPOs affect interest rates at longer maturities. This could happen because market participants could pre-position themselves in anticipation of future large IPO closings by borrowing over the medium term.*
- *Against the backdrop of several blockbuster IPOs in recent years that have garnered plenty of market attention well before their subscription periods, this paper investigates how future IPOs may affect longer-term HIBORs.*
- *Using textual analysis by counting relevant keywords in Chinese newspapers, a novel proxy for market attention on future IPOs is constructed. By augmenting this proxy into a regression model of HIBORs, this paper finds that during period with strong market attention on future IPOs, the three-month HIBOR also increased. The economic relevance of this proxy is further illustrated by two blockbuster IPOs (Xiaomi and Alibaba).*
- *This paper finds that news of future IPOs indeed has an effect on medium-term interest rates. This finding sheds some light on the market participants' evolving liquidity management practices.*

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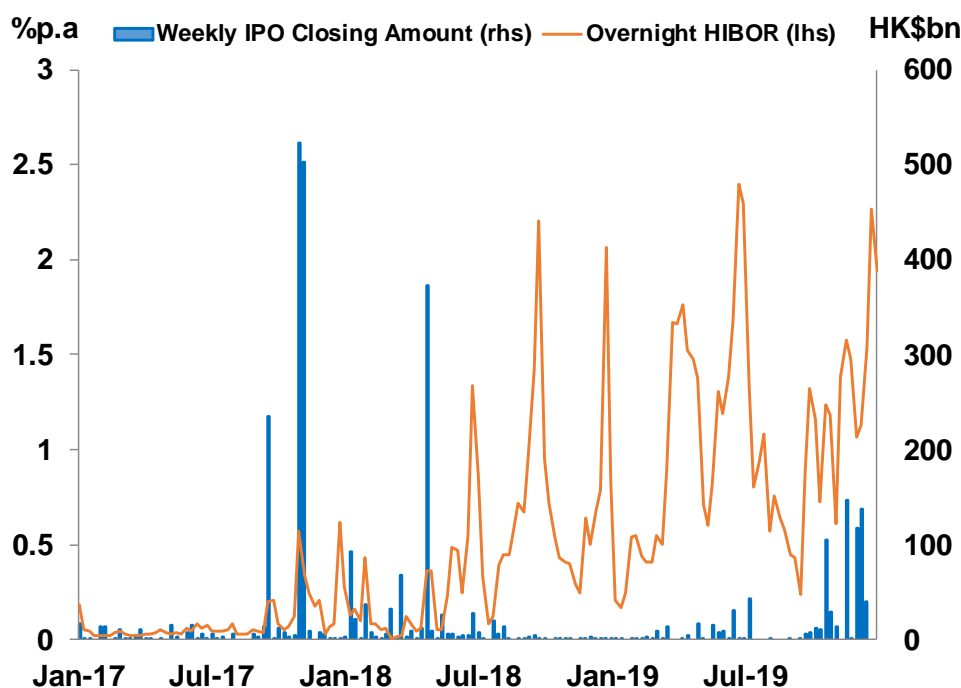
The views and analysis expressed in this paper are those of the authors, and do not necessarily represent the views of the Hong Kong Monetary Authority.

* The authors would like to thank Lillian Cheung, Jason Wu and Barry Yip for their useful comments, and Aaron Cheung, Sidney Cheung, Adrian Leung, Heman Leung and Susan Zhang for their outstanding research assistance.

I. INTRODUCTION

As a leading financial centre with a highly developed infrastructure and a global network, Hong Kong is a hub for major offshore fundraising, especially for initial public offerings (IPOs).¹ It is well-known that sizeable IPO subscriptions exert significant pressure on short-term HIBORs, especially near the closing date of subscription.² Chart 1 shows that some spikes in overnight HIBOR typically coincide with the closing of mega IPOs.³ What is less known, however, is the extent to which future IPOs – such as those that are at an early application stage – affect longer-tenor interest rates.

Chart 1: IPO closing amount and overnight HIBOR



Note: Based on weekly data.

Source: HKMA staff estimates.

¹ For instance, Ernst and Young’s Global IPO trend report shows that for the whole of 2019, Hong Kong ranked first among major stock exchanges in both the number of IPOs and proceeds.

² The day-end closing rate of HIBORs is used in this study.

³ The impact of mega IPOs on overnight HIBOR was more apparent in the second half of 2017 and the first half of 2018. Since then, the IPO market witnessed a notable slowdown due partly to less buoyant stock market activities in Hong Kong. Meanwhile, since the triggering of weak-side Convertibility Undertaking in April 2018, the reduction of the Aggregate Balance from over HK\$200 billion a couple of years ago to the current level of HK\$54 billion has made the overnight HIBOR more sensitive to changes in supply and demand of HKD funding, as evidenced by the increase volatility in Chart 1.

Future IPOs could affect longer-term HIBORs because market participants may pre-position themselves in anticipation of future large IPO closings by borrowing over the medium term. For example, if banks anticipate a blockbuster IPO in two-and-a-half months' time, they may prudently secure funds with repayment in three months' time, instead of borrowing just before the closing date. Taking into consideration banks' anticipated funding needs and their expectation of future interest rates, it is therefore not uncommon to observe that longer-term HIBORs could rise well before the IPO subscription period.

This paper investigates this question against the backdrop of several blockbuster IPOs in recent years that have garnered plenty of market attention well before their subscription periods. Using textual analysis, a novel proxy for the market attention on future IPOs ("Future IPO news") is constructed by counting IPO-related keywords from the news. By including this proxy into a regression model that aims to delineate the drivers of HIBORs, this paper finds that during period when there is strong market attention on future IPOs, the three-month HIBOR has also increased.

The rest of the paper is organised as follows. Section II discusses how "Future IPO news" is constructed from news. Section III describes the empirical model of HIBORs. Section IV discusses the empirical results and shows how "Future IPO news" can shed light on the movement of HIBORs in two blockbuster IPOs. Section V concludes.

II. MEASURING MARKET ATTENTION ON FUTURE IPOs

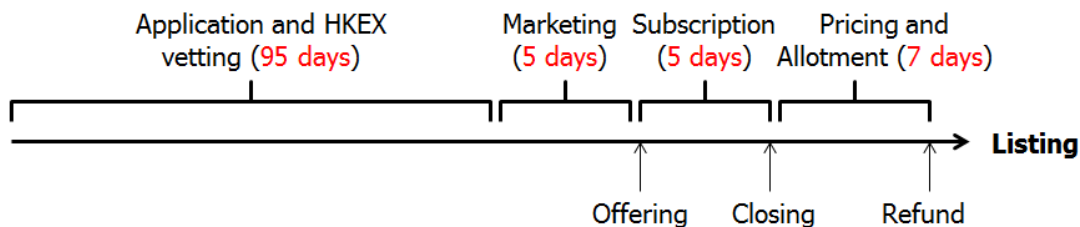
To measure the market attention on future IPOs, a proxy of "Future IPO News" is constructed using textual analysis by counting some specific keywords appearing in local Chinese news before IPO subscription periods.⁴ If a particular IPO receives

⁴ Textual analysis is quite common in IPO-related research. For example, Ferris, Hao and Liao (2012) conduct a textual analysis of IPO prospectus and find that conservatism in prospectus is positively related to underpricing. Loughran and McDonald (2013) find that the higher level of uncertain text used in Form S-1, the first SEC filing

extensive media coverage and intense attention, it is conceivable that this is a forward looking sign representing a high demand for investing in the company, prompting market participants to prepare funds earlier and driving up longer-term HIBORs.

We focus on local Chinese news archived by Wisers Information Portal. In determining the most relevant keywords for gauging market attention, the keyword “listing application” is chosen to mirror IPO subscriptions over the medium term. The rationale is largely based on the timeline of an ordinary listing process as shown in Chart 2. As a regular practice, after a company submits its listing application to the Hong Kong Stock Exchange, the application proof will be uploaded to the HKEX’s website, which will be picked up easily by the local media, with the keyword “listing application” reported in the news. In some cases, the media may learn the listing application from market or industries, and therefore report listing applications earlier than the publications of materials.⁵ If the application is successful, the closing date of an IPO subscription is, on average, about 100 calendar days after the publication of the application proof.⁶

Chart 2: Process for listing on Hong Kong Stock Exchange



Source: HKMA staff estimates, based on listing documents in HKEX’s website.

in IPOs, the higher will be the first-day returns, absolute offer price revisions, and subsequent volatility.

⁵ This phenomenon can be observed for listings of large or well-known companies (e.g. Alibaba in June 2019). Interestingly, although the HKEX allows submission of application documents on a confidential basis since 2019, news reporters may still be possible to trace listing applications for those large or well-known companies through information obtained from the market or industries.

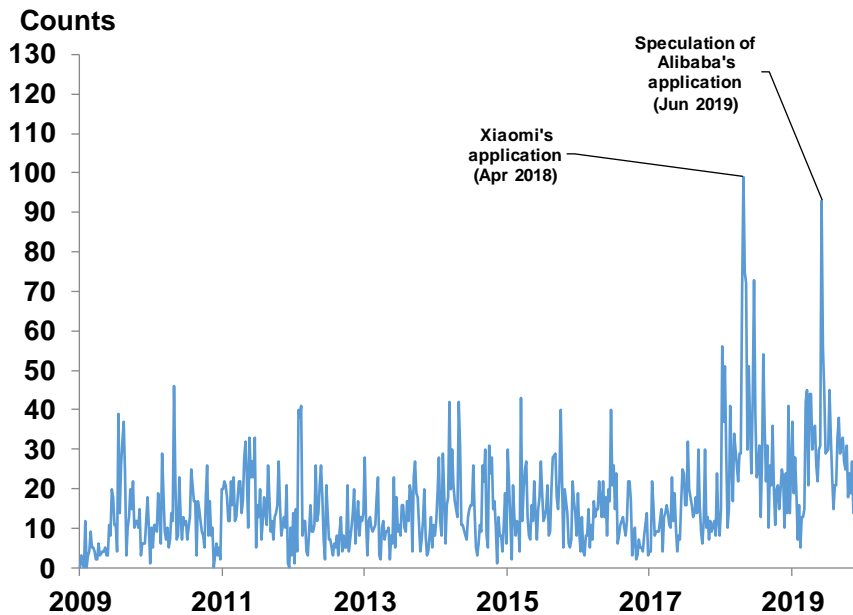
⁶ The listing process after submission of applications includes vetting and hearing by HKEX (requiring on average 95 calendar days). After hearing by the Listing Committee of HKEX, the company and underwriters can kick-start the marketing process together with the publication of prospectus (requiring on average 5 calendar days), and potential investors can submit IPO subscription before the specified closing date (requiring on average 5 calendar days). Finally, HKEX and underwriters can determine the offer price and carry out allotment of shares (requiring on average 7 calendar days) before refunding monies to those unsuccessful applications (i.e. on the refund date).

In addition to the keyword “listing application”, there are additional filters to refine the proxy. The reason is that “listing application” reported in some news may merely be related to regulatory and enforcement issues rather than indicating a genuine IPO application from a private company. Examples include news which report amendments on listing requirements by regulatory bodies and / or give related commentaries by market participants. In view of this, among the news containing the keyword “listing application”, a Boolean search is set to exclude those containing the keywords “Security and Future Commission” (證監會), “reverse takeover” (啤殼/借殼), “Webb” (i.e. David M. Webb)⁷ and “corruption” (貪, i.e. 貪污).

In each of the weeks from January 2009 to December 2019, the number of news counts is tallied and the resulting weekly time series of “Future IPO News” is presented in Chart 3. It shows that the news count for “listing applications” gained two spikes, in April 2018 and June 2019. The spike in April 2018 reflected Xiaomi’s listing application following a change in the rules by the HKEX to allow companies with a weighted voting right for listing, while the spike in June 2019 reflected speculation about Alibaba’s secondary listing in Hong Kong.

⁷ David M. Webb is a retired investment banker, running a website which provides reports and independent opinions with a focus on Hong Kong affairs, including but not limited to corporate governance, business, finance and investment. His name is often quoted in local news media on regulatory and enforcement issues.

Chart 3: “Future IPO news” based on the news count for “listing application”



Source: HKMA Staff estimates.

III. EMPIRICAL MODEL

A regression model on weekly frequency is constructed to assess how this news-count proxy affects changes in HIBORs. The model is estimated separately for the maturities spanning from overnight, 1-month and 3-month.⁸ The model also takes into account other factors that also affect the behaviour of HIBORs, with the major ones discussed below and summarised in Table 1.

- US interest rate: This is proxied by LIBORs with the same maturity of HIBORs.⁹ Under the Linked Exchange Rate System (LERS), Hong Kong’s interest rates should broadly follow their US counterparts. As such, we expect this coefficient

⁸ Longer-term HIBORs are not included in this study as interbank activities over three-month are not as liquid as their short-term counterparts. The illiquidity of long-term HIBORs can be evidenced by their significant deviations from the derived interest rate differentials from the forward points of the same tenor. Although there were concerns that three-month HIBOR could be subject to illiquidity problem which may exaggerate the economic significance of “Future IPO news”, we have replaced the three-month HIBOR with the three-month rate implied by forward points and found that the empirical results remained largely valid. For details, see Annex 1.

⁹ For example, for the model examining the overnight HIBOR, the overnight LIBOR will be used.

should be positive.¹⁰

- The Aggregate Balance (AB): This is used to proxy for the interbank liquidity. When interbank liquidity is scarce, there will be upward pressure on HIBORs. As such, the AB is expected to have a negative impact on Hong Kong dollar interest rates.¹¹
- Quarter-end effect: It is also well-known that the quarter-end effect exerts funding pressure on HIBORs. As market participants are likely to prepare funds well ahead of the end of the quarter, leads of the quarter-end dummy variables are included in the model.
- “Future IPO news”: This is the news-count proxy for the market attention on future IPOs as discussed above. If market participants pre-position themselves ahead of mega IPOs by borrowing well in advance of the actual listing, this is expected to have a positive effect on HIBORs on the longer end, but not on the shorter end (which is influenced by other shorter-term liquidity demand).

The full empirical model is discussed in details in the Annex. In particular, the model captures the effect on interest rates arising from the IPO closing and IPO refund separately, as illustrated by the timeline in Chart 2.

¹⁰ The model also includes an error correction term to govern the long run convergence of HIBORs towards LIBORs. The error correction term is simply the difference between HIBORs and LIBORs of the same maturity with a period lag.

¹¹ Theoretical relationship between AB and HIBORs can be nonlinear where the flatter (steeper) portion represents the more (less) abundant liquidity state in which the change in HIBORs are less (more) sensitive to the change in AB, which is related to studies of liquidity effect in the literatures (e.g. discussions in Friedman and Kuttner (2010)). In the present framework, this nonlinearity is introduced in a reduced-form fashion by imposing a logarithmic change in AB.

Table 1: Major drivers for changes in HIBORs

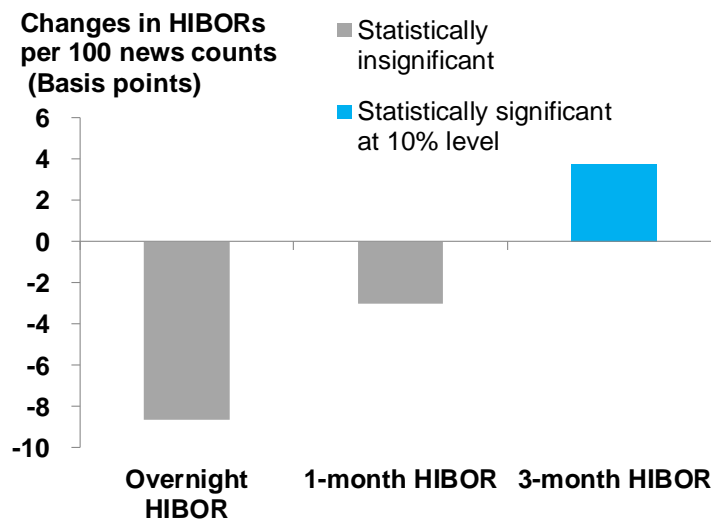
Driver	Indicator used	Expected impact on HIBOR	Rationale
US interest rate	LIBORs	+	Under the LERS, movements in HIBORs broadly track LIBORs
Interbank liquidity	Aggregate Balance	-	A larger AB is analogous to abundant interbank liquidity, thus softening HIBORs
Quarter-end funding need	Dummy variables for quarter-end	+	HIBORs typically spike ahead of quarter-end funding need
Future IPO news	News-count proxy	+ (especially for medium term-HIBORs)	Market participants pre-position themselves by securing funding in the medium term

IV. ESTIMATION RESULTS AND ILLUSTRATIONS

To examine the effect of market attention of future IPOs on HIBORs, Chart 4 shows the estimated changes in HIBORs of different maturities in response to 100 news counts for “listing application”.¹² It shows that the three-month HIBOR is the most responsive to future IPO news. Specifically, if the IPO is covered by the media 100 times, the model predicts that the three-month HIBOR will be increased by 3.7 basis points. On the other hand, “Future IPO News” does not appear to have an effect on other shorter-term HIBORs as the impact on those are statistically insignificant. These results are consistent with the timeline of a typical IPO process as outlined in Chart 2.

¹² The interest rate response in Chart 2 is calculated by multiplying the coefficient on “Future IPO news” by 100.

Chart 4: Estimated impact of “Future IPO news” on HIBORs



Source: HKMA staff estimates.

Given the significant effect of “Future IPO news” on the three-month HIBOR, it is evidence that market participants have pre-positioned themselves in anticipation of future large IPOs closing by borrowing over the medium term. To illustrate how the model can be used to track interest rate movements before and after the IPO activities, two blockbuster IPOs (Xiaomi and Alibaba) are used to carry out the attribution analysis on the changes in the three-month HIBOR.

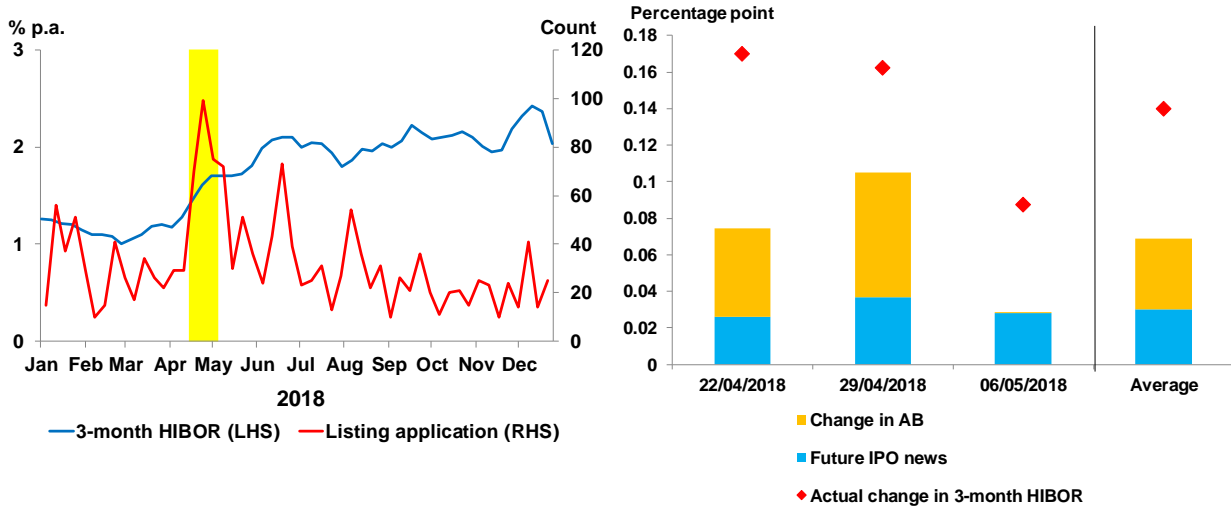
The case of Xiaomi: In April 2018, Xiaomi submitted its listing application to the HKEX following HKEX’s change of rules to allow companies with weighted voting right for listing. As the first such company to list in Hong Kong after the rule change, Xiaomi received strong market and media attention. This can be seen by the spike in “Future IPO News” shown in Chart 5A. Compared with the long-run average of around 10 news counts per week, “Future IPO News” apparently surged in April 2018, with most of the news related to Xiaomi’s listing.

Indeed, the attribution analysis shown in Chart 5B suggests that “Future IPO News” (the blue bar) was one of the major drivers for the rise in the three-month HIBOR during that period. It should be noted that other market factors also played a role on the rise. In particular, a reduction in the AB arising from the triggering of the weak-side

CU in April 2018 (the orange bar) also exerted upward pressure on HIBORs.

Chart 5: Xiaomi’s listing application in April 2018

A. “Future IPO news” and three-month HIBOR B. Contribution to change in three-month HIBOR



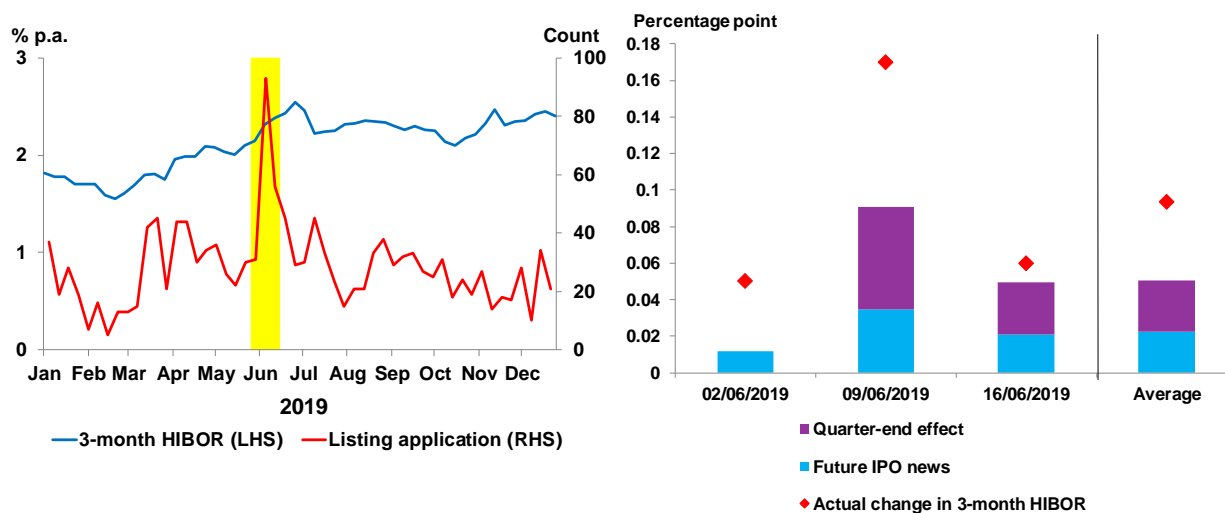
Source: HKMA staff estimates.

The case of Alibaba: In June 2019, Alibaba reportedly submitted its application for secondary listing in Hong Kong, and was expected to be listed in the second half of 2019. Reflecting its reputation and size as a leading conglomerate in the Mainland technology sector, the market and the media focused on its return to China and anticipated its listing in Hong Kong. Correspondingly, “Future IPO News” as shown in Chart 6A also started its upward trend well before the listing rumour in June.

The significant effect of “Future IPO News” on the three-month HIBOR can again be observed in attribution analysis in Chart 6B. It shows that the news covering Alibaba’s potential listing in Hong Kong was one of the major drivers for the rise in the three-month HIBOR (blue bar). As the rumour of Alibaba’s listing emerged near the end of June, Chart 6B also shows that the half-year end funding demand was another major contributor (purple bar), as banks needed to prepare funds straddling the half-year end, which were usually related to, but not limited to, dividend payments by listed companies in Hong Kong.

Chart 6: Anticipation of Alibaba’s listing in Hong Kong in June 2019

A. “Future IPO news” and three-month HIBOR **B. Contribution to change in three-month HIBOR**

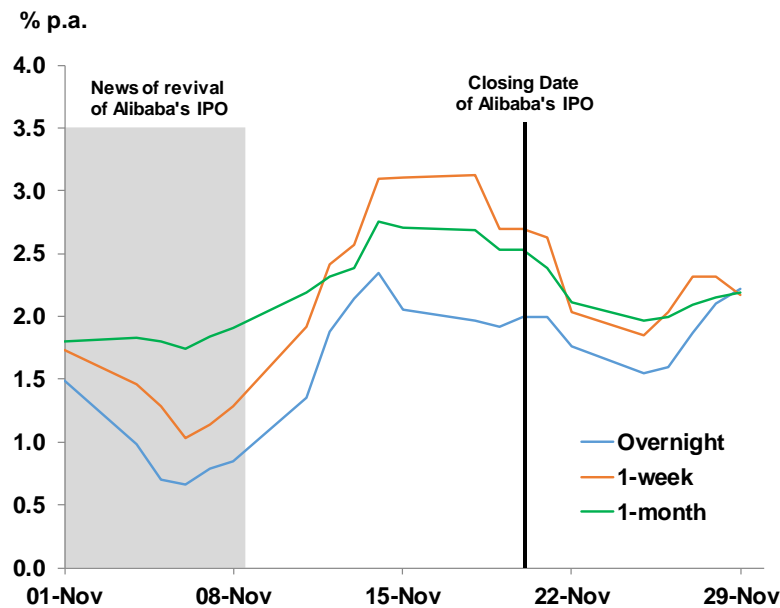


Source: HKMA staff estimates.

Although we focus on how market attention on future IPO news affects the medium term HIBOR, it is important to reiterate that sizeable IPOs do significantly affect short-term HIBORs. As Alibaba swiftly relaunched its IPO in November, market participants may not have been so well-prepared in advance as the news of its IPO revival only surfaced during the first week of November.¹³ With the IPO closing date on November 20 approaching, demand for short-term funding increased sharply, which led to notable rises in shorter-term HIBORs (Chart 7).

¹³ In Chart 6A, “Future IPO news” did not pick up notably in November. This is probably because market participants had anticipated Alibaba’s listing application, as well as a lack of interest in other listing applications during that period. A closer look into the news archive shows that most of the keywords at that time were “listing hearing” and “Alibaba’s roadshow” as opposed to “listing application”, the main keyword that was used to construct “Future IPO News”.

Chart 7: Overnight, one-week and one-month HIBORs in November 2019



Source: HKMA staff estimates.

V. CONCLUDING REMARK

It is well known that sizeable IPOs exert significant pressures on overnight HIBORs. What is less well known is whether market participants pre-position themselves to borrow funds in anticipation of a large IPO in several months. To test this hypothesis, this paper constructs a novel news-count proxy for the market attention on future IPOs and this “Future IPO news” variable into a regression model of HIBORs. Using two blockbuster IPOs as case studies, the empirical model further shows that, in addition to other factors that affect interbank markets, “Future IPO News” also explains a portion of the changes in the three-month HIBOR. This suggests that market participants are proactive in their preparation ahead of future large IPOs. As a result, this paper thus helps provide some insights into factors affecting medium-term interest rates and how the liquidity management of market participants is evolving.

Annex 1: The model for the determinants of HIBORs

The empirical model for HIBORs is an extension and modification of similar models used in Leung and Ng (2008), Wong and Wong (2011) and Cheung et al. (2017). The regression model in weekly frequency is shown as follows.

$$\begin{aligned}
 \Delta HIBOR_t &= \beta_0 + \beta_1(HIBOR_{t-1} - LIBOR_{t-1}) + \beta_2\Delta LIBOR_t + \beta_3\Delta \text{Log}(AB_{t-1}) \\
 &+ \beta_{41}IPO_{Closing,t} + \beta_{42}\frac{AB_{t-1}}{BKliab1m_{t-1}} \times IPO_{Closing,t} + \beta_{43}IPO_{Closing,t}^2 \\
 &+ \beta_{51}IPO_{Refund,t} + \beta_{52}\frac{AB_{t-1}}{BKliab1m_{t-1}} \times IPO_{Refund,t} + \beta_{53}IPO_{Refund,t}^2 \\
 &+ \beta_6 FutureIPOnews_t \\
 &+ \sum_{i=0}^{T_q} \left(\beta_{71i} Dummy_{Quarter,t+i} + \beta_{72i} \frac{AB_{t-1}}{BKliab1m_{t-1}} \times Dummy_{Quarter,t+i} \right) + \varepsilon_{1t}
 \end{aligned}$$

where

HIBOR denotes HIBOR at overnight, one-month or three-month maturity,

LIBOR denotes LIBOR at overnight, one-month or three-month maturity,

AB denotes the Aggregate Balance,

BKliab1m denotes banks' 1-month HKD liabilities,

FutureIPOnews denotes the news-count proxy as described in Section II,

IPO_{Closing} denotes closing-date of IPO monies,

IPO_{Refund} denotes refund-date of IPO monies, and

Dummy_{Quarter} denotes dummy variable for quarter-end.

The quadratic terms for *IPO_{Closing}* and *IPO_{Refund}* are introduced to capture any nonlinearity effect of IPOs on HIBORs. Meanwhile, their interaction terms with

$\frac{AB_{t-1}}{BKliab1m_{t-1}}$ are introduced to capture how the different size in AB as a ratio to the HKD

1-month liabilities would affect HIBORs for the same amount of IPOs, which is related

to studies of the liquidity effect in the literature.¹⁴ As market participants may likely get prepared earlier ahead of the quarter-ends, leads of $Dummy_{Quarter}$ are included. The interaction of $Dummy_{Quarter}$ and $\frac{AB_{t-1}}{BKliab1m_{t-1}}$ is also included to capture any possible liquidity effect. Weekly averages of daily data are used in the regression.

Table A1 shows the estimation results for different tenors of HIBORs. To address the concern that three-month HIBOR may not reflect the true funding cost as market participants typically would prefer using FX swap to obtain long-term funds, an extra estimation is performed using the three-month FX implied interest rate (marked by ^).¹⁵

Table A1: Estimation results for the models

Variables	Overnight	1-month	3-month	3-month [^]
<i>Constant</i>	-0.022 *** (0.008)	-0.017 ** (0.008)	-0.009 *** (0.004)	-0.007 *** (0.002)
$HIBOR_{t-1} - LIBOR_{t-1}$	-0.040 *** (0.014)	-0.034 * (0.019)	-0.004 (0.008)	-0.013 *** (0.004)
$\Delta LIBOR_t$	-0.335 (0.241)	0.117 (0.074)	0.037 * (0.021)	0.986 *** (0.019)
$\Delta \log(AB_{t-1})$	-0.341 * (0.176)	-0.325 *** (0.102)	-0.347 *** (0.076)	-0.068 (0.042)
$IPO_{Closing,t}$	4.1×10^{-4} ** (1.8×10^{-4})	0.001 *** (2.3×10^{-4})	2.1×10^{-4} ** (1.0×10^{-4})	1.5×10^{-4} *** (4.9×10^{-5})
$IPO_{Closing,t} \times \frac{AB_{t-1}}{BKliab1m_{t-1}}$	-0.008 ** (0.004)	-0.007 ** (0.003)	-0.003 ** (0.001)	-0.003 *** (0.001)
$IPO_{Closing,t}^2$	4.6×10^{-7} * (2.5×10^{-7})	-1.6×10^{-7} (1.8×10^{-7})	2.3×10^{-9} (9.6×10^{-8})	1.6×10^{-7} ** (7.0×10^{-8})
$IPO_{Refund,t}$	-3.1×10^{-4} (3.3×10^{-4})	-3.8×10^{-4} * (2.2×10^{-4})	-6.1×10^{-5} (1.2×10^{-4})	-5.8×10^{-5} (6.0×10^{-5})
$IPO_{Refund,t} \times \frac{AB_{t-1}}{BKliab1m_{t-1}}$	0.011 ** (0.005)	0.006 ** (0.003)	0.001 (0.002)	0.001 (0.001)
$IPO_{Refund,t}^2$	-7.3×10^{-7} ***	-2.8×10^{-8}	-6.7×10^{-8}	1.2×10^{-8}

(Cont'd on next page)

¹⁴ See Friedman and Kuttner (2010) for further discussions.

¹⁵ FX implied interest rate is calculated based on covered interest rate parity by converting the forward points into the interest rate differential.

	(2.8x10 ⁻⁷)	(2.0x10 ⁻⁷)	(1.0x10 ⁻⁷)	(8.5x10 ⁻⁸)
<i>Dummy</i> _{Quarter,t}	0.306	-0.009	-0.012	-0.023 ***
	(0.224)	(0.086)	(0.045)	(0.008)
<i>Dummy</i> _{Quarter,t} × $\frac{AB_{t-1}}{BKliab1m_{t-1}}$	-4.891	0.638	0.400	0.603 ***
	(4.189)	(1.651)	(0.867)	(0.135)
<i>Dummy</i> _{Quarter,t+1}	0.476 ***	0.087 *	0.032 **	-0.016
	(0.147)	(0.048)	(0.015)	(0.014)
<i>Dummy</i> _{Quarter,t+1} × $\frac{AB_{t-1}}{BKliab1m_{t-1}}$	-8.593 ***	-1.241	-0.374	0.428
	(2.761)	(0.881)	(0.307)	(0.281)
<i>Dummy</i> _{Quarter,t+2}		0.191 ***	0.067 **	0.040 ***
		(0.056)	(0.026)	(0.013)
<i>Dummy</i> _{Quarter,t+2} × $\frac{AB_{t-1}}{BKliab1m_{t-1}}$		-3.367 ***	-1.170 **	-0.814 ***
		(1.074)	(0.491)	(0.234)
<i>Dummy</i> _{Quarter,t+3}		0.133 **		
		(0.052)		
<i>Dummy</i> _{Quarter,t+3} × $\frac{AB_{t-1}}{BKliab1m_{t-1}}$		-2.142 **		
		(0.969)		
<i>FutureIPOnews</i> _t	-0.001	-3.0x10 ⁻⁴	3.7x10 ⁻⁴ *	1.9x10 ⁻⁴ *
	(0.001)	(4.6x10 ⁻⁴)	(2.1x10 ⁻⁴)	(1.1x10 ⁻⁴)
<i>Adjusted R</i> ²	0.16	0.11	0.12	0.61

Note: Newey-West standard errors in parentheses. *, **, *** denote statistical significance at the level of 10%, 5% and 1% respectively.

^ Estimation based on FX implied interest rate.

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