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Research Paper No. 44: How short-selling activity affects liquidity of the Hong Kong stock market

17 April 2009

Executive Summary

1. In October 2008, the SFC issued a research paper entitled "Short Selling in the Hong Kong Stock Market" (Research Paper No. 42), which discussed short-selling patterns in Hong Kong. In this paper, we go further and study how short-selling activity affects liquidity in the Hong Kong stock market in terms of market depth and tightness of spreads.

2. Our regression analysis for the period 2005 to 2008 shows that trading volume rose as short selling increased. Short selling improves market efficiency and increases turnover, be it directly or indirectly. As short selling helps price discovery, it encourages trading in the overall market. Short selling also facilitates trading by professional investors and attracts additional trading.

3. Short-selling activity helped narrow bid-ask spreads. Market makers in the stock options and futures markets are not bound by the tick rule, i.e. they can place short-selling orders at best-ask prices or even lower to seek quick or instantaneous execution. Our study showed that the majority (over 80%) of the market making, short-selling orders was placed at best-ask prices or lower and that this contributed to tighter bid-ask spreads.

4. Some overseas markets tightened their short-selling regulations temporarily in response to increased market volatility after the Lehman Brothers bankruptcy in last September. However, studies since then have shown that these restrictions did not necessarily reduce volatility, and that some of these measures may even have reduced liquidity in the stock market.

5. The short-selling regime in Hong Kong is more stringent than those that were in place in other major overseas markets prior to their implementation of temporary restrictive measures. In Hong Kong, only "covered" short selling in securities meeting certain eligibility requirements is permitted. In addition, short sales are subject to the tick rule.

Background

6. Short selling refers to the selling of a security that the seller does not own. Many saw it as one of the key factors contributing to the recent increase in stock market volatility. Indeed, this led a number of major markets to impose short-selling restrictions soon after the Lehman Brothers (LB) collapse in mid-September 2008. Others however, including some economists, market participants and international organisations, believe that short selling helps reduce volatility and contributes to market liquidity.

    (a) According to Hong and Stein (2003)[1], restrictions on short sales reduce the speed at which negative information is reflected to the market, and will potentially increase volatility.

    (b) The Reserve Bank of Australia (RBA) has pointed out that short selling adds to market liquidity and pricing efficiency, contributing to lower bid-offer spreads and helping to ensure that prices reflect the views of both bullish and bearish investors.[2]

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[1] "Differences of Opinion, Short-Sales Constraints, and Market Crashes", Hong, H and J. Stein, Review of Financial Studies 16, 2003

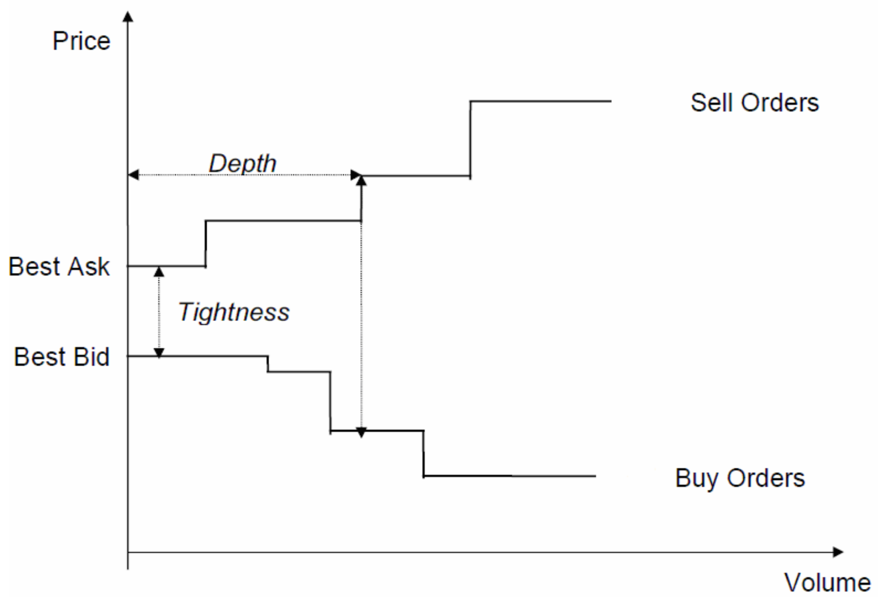
[2] See the RBA's May 2008 Review of Settlement Practices for Australian Equities, at http://www.rba.gov.au/PaymentsSystem/StdClearingSettlement/Pdf/review_sttlmt_prac_aus_equities_052008.pdf

(c) The Technical Committee of the International Organization of Securities Commissions (IOSCO) believes that short selling plays an important role in the market for a variety of reasons, such as providing more efficient price discovery, mitigating market bubbles, increasing market liquidity, and facilitating hedging and other risk management activities[3].

7. In October 2008, the SFC issued a research paper entitled "Short Selling in the Hong Kong Stock Market" (Research Paper No. 42), which discussed short-selling patterns in Hong Kong. In this paper, we go further to examine how short-selling activity affects market liquidity. We do this by focusing in particular on the impact of short selling on market depth and tightness of spreads as described below.

(a) Market depth – Market depth refers to the ability of a stock market to absorb large-sized orders without creating a significant impact on share prices. In a deep market, investors should be able to buy or sell large amounts of shares without having any significant impact on share prices. Since turnover contributes to market depth, we can assess the impact of short selling on market depth (and hence on liquidity) by examining how short-selling activity affects market turnover.

(b) Tightness of bid-ask spreads – Bid-ask spreads, i.e. the amount by which the ask price (at which a seller is willing to sell shares) exceeds the bid price (for which a buyer is willing to pay for such shares), measure the cost and easiness with which stocks can be traded. In a liquid market, the bid-ask spread should be tight (narrow). We can therefore assess the impact of short selling on liquidity by examining how short-selling activity affects bid-ask spreads.



Dimensions of market liquidity

Source: *"How safe was the "Safe Haven"? Financial market liquidity during the 1998 turbulences"*, Christian Upper, Bank for International Settlements (BIS) Paper, February 2000

3 The IOSCO Consultation Report on Regulation of Short Selling published in March 2009 at http://www.iosco.org/library/pubdocs/pdf/IOSCOPD289.pdf, the IOSCO press release dated 2 October 2008 and IOSCO Report on "Transparency of Short selling" (2003)

8. As mentioned above, many major overseas markets introduced measures to temporarily restrict or suspend short selling in the aftermath of LB collapse. Various studies have been done on how these measures affected market liquidity. This paper also takes into account the findings of those studies.

9. Before going further, it is worth highlighting that the short-selling regime in Hong Kong is more stringent than those in other major overseas markets prior to their implementation of temporary restrictive measures. In Hong Kong, only "covered" short selling in securities that satisfies certain eligibility requirements is permitted. In addition, short sales are subject to the tick rule. (The Hong Kong regime is discussed in greater detail in Research Paper No. 42.)

Short selling boosts market activities

Rationale

10. During 2008, short-selling activity accounted for 7.5% of the total market turnover in Hong Kong. This reflects the direct contribution of short selling to market turnover. However, short selling also generates additional trading indirectly, as liquidity begets liquidity. In addition, short selling improves market efficiency and helps attract more trading as follows:

   (a) Short-selling activity helps price discovery, for instance, by reflecting negative information to the market, which in turn generates more trading interest and hence increased trading in the overall market;

   (b) Short selling also facilitates professional investors such as hedge funds, which adopt a long/short strategy[4]; and

   (c) Short selling contributes to trading in the derivatives market which can in turn contribute to cash market activity. It is commonly used by market makers of stock options and stock futures to hedge their market-making positions.

Hypothesis and methodology

11. To examine whether short-selling activity has a multiplying effect on trading, we regress[5] turnover velocity of the Hong Kong stock market on short selling turnover using monthly data during 2005–2008. In this regard:

   (a) short-selling turnover refers to short-selling turnover as a percentage of stock turnover; and

   (b) turnover velocity refers to stock turnover divided by market capitalisation.

12. We conduct the same test on HSI constituents to ascertain our results.

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[4] According to the Report of the Survey on Hedge Funds Managed by SFC Licensed Managers (for the Period 31 March 2004 – 31 March 2006), 34% of the hedge funds reported by the respondents adopted equities long/short strategy. It was followed by multi-strategies (25%), which are also equities long/short predominated.

[5] Regression analysis is a commonly adopted statistical method to examine the causal relationship between independent variables and the dependent variable. A t-statistic measures the statistical significance of an independent variable in explaining the dependent variable. F-statistics are used to evaluate whether a regression equation significantly explains changes in the variables.

Results

13. The regression results show that turnover velocity rose as short-selling turnover increased in the sample period. Short-selling activity appeared to have a statistically significant impact on turnover velocity. The t-statistic for the regression of the Hong Kong stock market was 5.9 and F-statistic was 34.9. The t-statistic for the regression for HSI constituents was 6.6 and F-statistic was 43.8. In other words, as short selling increased, turnover velocity (i.e. stock turnover divided by market capitalisation) also increased.

Short selling tightens bid-ask spreads

Rationale

14. Under the tick rule, short sellers can only place their orders at or above the best (lowest) current ask price, and wait in queue for their orders to be executed. However, exemptions to the tick rule are granted to market makers in the stock options and stock futures markets[6] who short sell to hedge their market making positions[7]. In fact, to minimise exposure, market makers often seek fast or even instantaneous execution of their short sales by placing the orders below the best-ask price or even as low as the bid price (i.e. hitting the bid directly, also known as “hit bids”). This section discusses how market makers’ short-selling activity contributes to tighter bid-ask spreads.

Hypothesis and methodology

15. We analyse the prices at which all sell orders (i.e. both long-sell[8] and short-sell orders) are placed for the 16 sample stocks listed below. These 16 stocks are among the 25 stocks with the largest market capitalisation in Hong Kong (55% of the market total as of end 2008), and with active turnover and short-selling turnover (each accounting for 51% of the market total during 2008). Our analysis covers the last quarter of 2008.

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[6] Under the mechanism, market makers input quotes to the trading systems on request and/or on a continuous basis to provide market liquidity in the stock options and futures market. Market-makers provide liquidity by taking the opposite side of a transaction. If an investor wants to buy, the market maker sells and vice versa. In exchange for this service, market-makers buy at a low-bid price and sell at a higher ask price to make profits.

[7] Short selling activity can include directional trading and market-making activity. Exemptions to the tick rule are granted to market-making activity, which is considered market neutral.

[8] Long sell refers to the selling of stocks that the seller owns. This is in contrast to short selling, which means the selling of a security that the seller does not own.

List of sample stocks on analysis about market-making activity

Stock Code	Stock Name	Mkt Cap (HK$ bn) end 2008	Share of Market Total (%)	Average Daily Turnover (HK$ mn) (2008)	Share of Market Total (%)	Average Daily Short Selling Turnover (HK$ mn) (2008)	Share of Market Total (%)	Short Selling to Turnover (%)
1	CHEUNG KONG	169.77	2%	803.33	2%	103.11	2%	13%
5	HSBC HOLDINGS	892.14	9%	2,920.15	6%	332.84	6%	11%
11	HANG SENG BANK	194.43	2%	476.76	1%	102.88	2%	22%
13	HUTCHISON	165.63	2%	663.41	1%	51.33	1%	8%
16	SHK PPT	165.66	2%	1,150.31	2%	175.98	3%	15%
386	SINOPEC CORP	78.70	1%	1,402.55	3%	120.96	2%	9%
388	HKEX	79.11	1%	1,444.30	3%	239.47	4%	17%
857	PETROCHINA	143.26	1%	2,052.41	4%	102.87	2%	5%
883	CNOOC	323.41	3%	1,606.43	3%	123.74	2%	8%
939	CCB	954.93	9%	2,104.12	4%	250.47	5%	12%
941	CHINA MOBILE	1560.06	15%	3,483.56	7%	326.54	6%	9%
1398	ICBC	338.87	3%	2,167.38	4%	219.63	4%	10%
2318	PING AN	95.95	1%	1,082.30	2%	140.55	3%	13%
2628	CHINA LIFE	175.24	2%	3,078.00	6%	278.40	5%	9%
3328	BANKCOMM	128.93	1%	715.40	1%	100.46	2%	14%
3988	BANK OF CHINA	161.16	2%	1,144.45	2%	97.73	2%	9%
	Group Total	*5,627.25*	*55%*	*26,294.84*	51%	*2,766.94*	*51%*	11%
	Market (Equity) Total	***10,298.75***	***100%***	**51,771.09**	***100%***	**5,384.33**	***100%***	***10%***

Source: SFC Research

Results

16. As the data below indicate, short selling in general, and market-making-related short selling, in particular, contribute to tighter bid-ask spreads, higher turnover and enhances market depth. Our study showed that compared to long-sell orders, short-selling orders are tighter in bid-ask spreads. Short sellers tend to place their orders at best-ask prices, and in the case of market makers, at best-ask prices or lower prices.

(a) For market-making related short-selling orders, about:

(i) 34% were hit-bid orders, thus contributing directly to turnover;

(ii) 14% were placed at lower than best ask prices, hence narrowing the bid-ask spreads;

(iii) 34% were placed at best ask prices, which adds to market depth; and

(iv) 17% were placed at higher ask prices.

(b) For other short-selling orders:

(i) None was a hit-bid order (not allowed);

(ii) None was placed at lower than best-ask prices (not allowed);

(iii) 59% were placed at best-ask prices; and

(iv) 41% were placed at higher ask prices.

(c) For long-selling orders:

(i) 29% were hit-bid orders;

(ii) 3% were placed at lower than best-ask prices;

(iii) 27% were placed at best-ask prices; and

(iv) 41% were placed at higher ask prices.

It should also be noted that, a large portion of market-making related short-selling orders are hit-bid orders, which directly increases trading. Some help tighten the bid-ask spreads and other short-selling orders add to the market depth. In contrast, for long-selling orders, smaller portions of them are hit-bid orders, placed at lower than best-ask prices or at best-ask prices.

Placing of selling orders during October-December 2008

Placing of Selling Orders	% share of total market making related short-selling orders	% share of short-selling orders not relating to market making	% share of long sell orders
Hit-bids	34.2%	0.0%	28.9%
Lower than best-ask prices (but did not hit bid)	14.3%	0.0%	2.8%
At best-ask prices	34.4%	59.1%	27.1%
1 tick above best-ask prices	10.6%	13.3%	8.8%
2 or more ticks above best-ask prices	6.4%	27.6%	32.4%
Total	*100%*	*100%*	*100%*

Source: SFC Research
Remark: Ticks refer to the minimum price fluctuations.

Impact of short-selling restrictions overseas

17. In response to the increase in market volatility after the LB bankruptcy, short-selling regulations were tightened temporarily in a number of major overseas markets, including the United States, the United Kingdom and Australia. Some financial institutions and company executives claimed that shares were being driven down artificially by speculators who short sold stocks, and that this in turn added to investor worries and drove stock prices even lower. However, a number of studies have shown that restrictions on short selling provided little support for stock prices. Since the restrictions on short selling in major markets were first introduced in September 2008, stock markets

across the globe have continued to fall steeply as the economic outlook deteriorated[9]. Marsh and Niemer (2008) [10] also showed that there was no strong evidence that the imposition of restrictions on short selling in the UK, or elsewhere, had changed the behaviour of stock returns. Regression analysis on 17 countries suggested that changes in the securities returns were mainly driven by sector-specific factors other than the restrictions on short selling. Moreover, some studies showed that some of these measures reduced liquidity in the stock market.

The US

18. The US Securities and Exchange Commission (SEC) temporarily banned the short selling of some 800 (later increased to some 1,000) financial stocks from 18 September to 8 October 2008.

19. Credit Suisse analysed the impact of these short-selling bans and:

    (a) observed that with a decline in trading volume, trades had a higher potential to move the market – thereby increasing volatility, and

    (b) estimated that the average bid-ask spreads for the US securities subject to the short-selling restriction had widened to around 40 bps in the week beginning 22 September, further expanding to almost 60 bps in early October, which was higher than the annual average of 17 bps. [11]

20. Based on the New York Stock Exchange's short-selling data, short selling as a whole (i.e. not only in financial stocks) typically accounted for 12% of total equity turnover. This:

    (c) dropped to 8% during the period when the SEC temporarily banned the short selling of financial stocks, and

    (d) rebounded to 12% after the restrictions were lifted.

    The ban on short selling in financial stocks in the US therefore seemed to have resulted in a drop in short-selling turnover of not only financial stocks, but also non-financial stocks, leading to a fall in overall liquidity.[12]

The UK

21. On 19 September 2008, the UK Financial Services Authority imposed restrictions on short selling in financial stocks. The restrictions ended on 16 January 2009.

22. Clifton and Snape (2008)[13] found an overall decline in liquidity immediately following the restrictions, and such decline was particularly large in stocks subject to those restrictions. FTSE 100 companies that were subject to the restrictions were compared against a control sample of FTSE 100 securities that were not within the scope of the restrictions. It was found that the restricted stocks exhibited statistically significant deterioration in liquidity, more specifically:

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[9] "Short-selling ban has minimal effect", Financial Times, 18 December 2008
[10] "The Impact of Short Sales Restrictions", Ian W. Marsh and Norman Niemer, 30 November 2008
[11] Trade News article on "Short-sale bans widen spreads and increase volatility – Credit Suisse", 17 October 2008
[12] The ratio of short selling to total equity turnover declined by 4 percentage points (i.e. from 12% to 8%). Of this, financial stocks accounted for 1.8 percentage points and non-financial stocks accounted for 2.2 percentage points. Short selling facilitates professional investors like hedge funds who adopt long/short strategy. If short selling for financial stocks is prohibited, trading arising from this strategy will decline as well, thereby reducing market liquidity and overall short selling and trading in the market. Moreover, in addition to short selling restrictions, other measures such as requirements to report significant short positions might have contributed to the decrease in liquidity also.
[13] The Effect of Short-selling Restrictions on Liquidity: Evidence from the London Stock Exchange, Matthew Clifton and Mark Snape, 19 December 2008

(a) The average spreads had increased following the restrictions in short selling, and the increase in spreads in the restricted stocks was 150% greater than the increase in spreads in control stocks.

(b) Turnover in restricted stocks had fallen by 21% after the restrictions compared to a rise in turnover of 42% in the control stocks.

Australia

23. Australia banned short selling on 22 September 2008. The ban on non-financial stocks has now been lifted, but the ban on financial stocks will continue until 31 May 2009.

24. Plato Investment Management[14] showed that the latest short-selling ban might have caused significant decreases in stock market liquidity, as measured by spread and turnover. The study analysed trading data of a panel of S&P/ASX300 stocks before and after the introduction of the ban. It also studied how turnover in the whole market changed after short selling was banned. According to the study, the short-selling ban slowed price discovery processes, increased trading cost and hindered efficient trading, in particular:

(a) The study found that stock market liquidity decreased, as measured by stock turnover and spreads. The average stock turnover of sample stocks - the number of shares traded in a stock divided by the shares outstanding - fell from 0.44% to 0.36% after the introduction of the short-selling ban. The spread increased from 0.42% to 0.50% after the ban.

(b) The study also found that intraday volatility increased from 1.05% to 1.08% after the ban.

Impact on Hong Kong

25. Hong Kong did not introduce any temporary measures to restrict short selling since it already had tighter restrictions in place than many overseas markets. At some stage, some concerns were raised that as short selling was restricted in major markets, short-selling activity might flow into Hong Kong.

26. However, Hong Kong's short-selling turnover, as a percentage of the total market turnover, declined from 8.5% during the period from 1 July to 18 September 2008 (before the short-selling ban was imposed on US financial stocks) to 6.7% during 19 September to 31 December 2008.

27. The percentage remained relatively stable at 7.4% and 8% in January and February 2009 respectively. It appears, therefore, that the ban in short selling in the US and the UK did not have a significant impact on the short selling in Hong Kong.

Conclusion

28. This paper shows that short-selling activity in Hong Kong helped increase turnover both directly and indirectly. Short selling improves market efficiency and market liquidity, helps price discovery and encourages trading. Short selling also facilitates professional investors and attracts additional trading. Without short selling, this additional trading would disappear. This is consistent with the results of studies elsewhere which found

[14] "Has the Short Selling Ban Reduced Liquidity in the Australian Stock Market?", Plato Investment Management, 24 October 2008

that recent restrictions on short selling in various overseas markets reduced market liquidity.

29. Our study also showed that short-selling activity helped narrow bid-ask spreads. In Hong Kong, market makers of stock options and stock futures seek instantaneous transactions in order to minimise their exposure, and therefore tend to place their orders at best-ask prices or even lower prices. This helps tighten bid-ask spreads.

30. After the collapse of LB, temporary short-selling restrictions were introduced in a number of markets. Studies have shown that the banning of short selling may have impaired liquidity and market efficiency, and that its effectiveness in reducing volatility of share prices remains questionable.