



Post Launch Review of After-Hours Futures Trading

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Hong Kong Exchanges and Clearing Limited
香港交易及結算所有限公司

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EXECUTIVE SUMMARY

1. After-hours Futures Trading (AHFT) was introduced on 8 April 2013 with Hang Seng Index (HSI) futures and H-shares Index (HHI) futures available for trading from 5 pm to 11 pm in addition to the Day Session. This paper reviews the market activities in the AHFT Session during the first 6 months' trading covering the period from 8 April 2013 and 7 October 2013 (Review Period) and focuses on four major areas in AHFT: (a) market participation; (b) trading activities; (c) market integrity; and (d) Exchange Participants / Clearing Participants (Participants) operations. This review also included market feedbacks collected from different types of Participants, including institutional Participants, retail Participants and Participants not yet registered for AHFT.
2. Since the introduction of AHFT, the number of Participants registered for AHFT has increased from 115 to 140 (out of the total 179 HKFE Exchange Participants), which accounted for 98% of HSI futures and HHI futures market share in 1H, 2013. By the end of the Review Period, 127 Participants have participated in AHFT and on average 82 Participants participated in AHFT each trading day.
3. Retail based Participants contributed 37% of trading volume in AHFT session, which demonstrated that AHFT was well received by retail investors.
4. During the Review Period, total number of 773,936 contracts were traded in AHFT Session with the average daily volume (ADV) to be 6,292 contracts in AHFT Session. The AHFT volume reached a record high of 18,813 contracts on 25 June 2013. The percentage of AHFT volume compared to the day session volume increased from 2.2% in April 2013 to 5.4% in October 2013. The record percentage of AHFT volume compared to the day session volume was 9.4% on 6 September 2013.
5. AHFT was more active after US market open. On average, 48% of AHFT volume was executed between 9:30 pm and 11:00 pm (Hong Kong time), i.e. after US market open in Summer time.
6. With active participation from Participants, the market bid/offer spread was tight and the most frequently observed bid/offer spread was 4 index points (or 1.7 basis points), which was tighter than the maximum liquidity providers' spread obligation of 20 index points.
7. Trading was orderly in AHFT session and no excessive price movements were observed. During the Review Period, the maximum movement of AHFT prices compared to the day session close did not exceed 2.3%. In addition, the price movements in AHFT session were more correlated to major international stock index futures than day session, which suggested that the price movements during AHFT were in line with international markets.
8. There was no incident in the clearing operations for the Clearing House and Participants. The post trades process was smooth with most of the post trades took place between 7:30 a.m. and 8:45 a.m. on the next day morning, which accounted for 86% of the total number of post trades. On average, 37 Participants conducted post-trade activities in the next morning following the AHFT. There were limited needs for post-trades after AHFT Session closes, i.e. accounted for 2% only.

9. On market-wide risk management, the Exchange imposed +/-5% price limit in the AHFT Session to limit potential excessive price movement, price limit was not triggered during the Review Period. In addition, the Clearing House risk management measures include a mandatory margin and variation adjustment (VA) calls in the next morning and monitoring the Capital-based position limit (CBPL) of each Participants. On average, HK\$379 million was called for mandatory margin and VA each day which was about half the amount of the Day End Margin and other Money Obligations being called after the close of the Day Session. On average, 11 Participants were being called for mandatory margin and VA. The collection of mandatory margin and VA completed well before the 12:00 noon deadline (on average by 10:10 a.m; earliest by 9:44 a.m. and latest by 10:51 a.m). There was no default case for Participants to meet the mandatory margin and VA calls. Regarding CH's monitoring of CBPL of each CP, there was no incident that Participants traded beyond their CBPL during AHFT. In addition, the SOS center was not used by Participants.
10. HKEx has collected market feedbacks from different types of Participants during the Review Period, including institutional Participants, retail Participants and Participants not yet registered for AHFT, covering a total of 70 Participants with market shares about 75% in HSI futures and HHI futures in 1H, 2013, the general comments were as follows:
 - a) No unusual price movements observed during AHFT;
 - b) The trading spreads were encouraging;
 - c) The +/-5% price limit should be in place to safeguard the market from excessive movements, if any;
 - d) Participants' operations were smooth and no incident reports on the reporting and monitoring of Large Open Positions;
 - e) Most of the participating Participants, which had overseas futures business, already had staff supporting night desk operations. For some Participants which ran Hong Kong futures business only, they have arranged 2 shifts for existing staff to support AHFT session; and
 - f) No issue on client margin calls and no issue on issuance of client statements.
11. Considering the development needs for AHFT and feedbacks from the market, HKEx plans to add more products in AHFT session so as to increase business opportunities for Participants, including mini index futures, RMB currency futures and commodities futures. Furthermore, HKEx plans to introduce block trade facility in AHFT Session to facilitate the execution of large orders. In addition, HKEx would consider extending the closing hour of AHFT session to compensate for the reduction of overlapping hours with the US market in Winter time.

PART A: INTRODUCTION

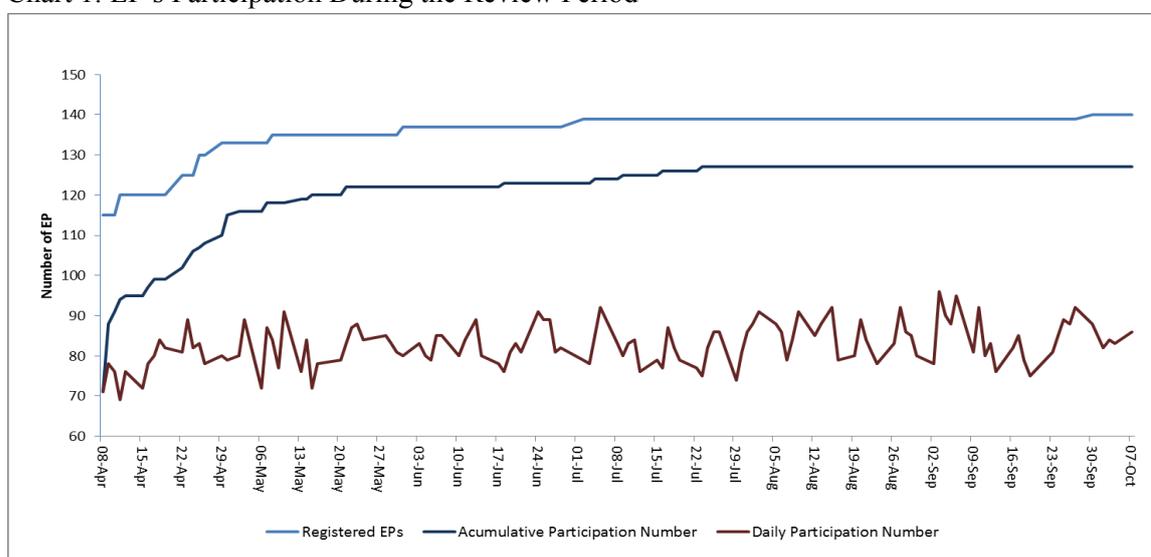
12. HKEx introduced AHFT in its derivatives market on 8 April 2013 to enable investors to hedge or adjust their positions in response to market news and events in the European and US time zones and provide a new source of business growth for futures brokers. AHFT also serves the strategic objective of Hong Kong in becoming a Renminbi (RMB) offshore centre by offering more RMB products in the future. Furthermore, AHFT is a pre-requisite for HKEx to further develop products on asset classes which trade on global basis including commodities and foreign exchange.
13. In addition to the regular trading session (Day Session), i.e. 9:15 am to 12:00 noon and 1:00 pm to 4:15 pm, HKEx introduced AHFT Session between 5:00 pm and 11:00 pm with HSI futures and HHI futures available for trading during AHFT. All trades transacted in AHFT Session are registered as T+1 trades and are cleared and settled on the following trading day. HKEx manages the risk of AHFT through appropriate regular, ad-hoc and/or real-time monitoring during AHFT Session and via a new mandatory margin and VA call following the market open of each Day Session. HKEx implemented a 5% price limit up/down mechanism during AHFT Session, i.e. no sell order of price below 95% and no buy order of price above 105% of the last traded price of the spot month contract in the Day Session would be allowed, which are applied to all contract months.
14. In addition, HKEx introduced a liquidity provider (LP) program for HSI futures and HHI futures during AHFT Session for a period from 8 April 2013 to 31 December 2013 to facilitate trading in AHFT with reference prices provided by LPs. Two LPs in HSI futures and HHI futures were appointed and required to provide continuous two-way quotes in the spot month of each product with a bid / offer spread not greater than 20 index points and a quote size not less than 5 contracts for not less than 80% of the trading hours in AHFT Session.
15. This paper reports the finding of the review of the market activities in AHFT Session during the first 6 months' trading covering the period from 8 April 2013 and 7 October 2013 (Review Period). This review focuses on four major areas in AHFT:
 - a) Market participation – number of Participants registered for AHFT, numbers of EP actually participated in trading and the participation by types of Participants;
 - b) Trading activities - trading volume and intra-day distribution, bid / ask spreads and price discovery function of AHFT;
 - c) Market integrity - the price correlation with international markets during AHFT and the market-wide risk management measures including price limit, mandatory margin and VA calls and monitoring of CBPL; and
 - d) Participants' operations - review Participants' post-trade activities and Participants' risk management operations in handling the mandatory margin and VA calls.

In addition, HKEx collected feedbacks from different types of Participants, including institutional Participants, retail Participants and Participants not yet registered for AHFT, covering a total of 70 Participants with market shares about 75% in HSI futures and HHI futures in 1H, 2013. Details of the findings are set forth in the following sections.

PART B: MARKET PARTICIPATION

16. This section provides an overview on Participants' participation in AHFT during the Review Period.
17. Since the introduction of AHFT on 8 April 2013, the number of Participants signed up for AHFT has increased from 115 to 140 (out of the total 179 HKFE Participants), which accounted for 98% of HSI futures and HHI futures market share (1H, 2013). The total number of Participants participated significantly increased by 73% (from 71 Participants on the first day of launch to 127 Participants), i.e. about 90% participation rate among 140 registered Participants). There were 82 Participants participated in AHFT on average each day.

Chart 1: EP's Participation During the Review Period



18. HSI futures trading was welcomed by retail investors with retail participation accounted for 47% of HSI futures market shares during AHFT Session (compared to 43% market shares from institutions). There was more active institutional participation in HHI futures, which accounted for 68% of HHI futures volume (compared to 26% market shares from retail Participants). Two liquidity providers¹ (LPs) were providing reference prices during AHFT and accounted for 10% and 6% market shares of HSI futures and HHI futures during AHFT Session respectively. The composition of participation of HSI futures, HHI futures and overall market in AHFT are set forth in chart 2 to 4.

¹ Liquidity Provider is required to provide continuous quotes in the spot month with bid / offer spread not greater than 20 index points and quote size not less than five contracts for at least 80% of trading time in AHFT session each month

Chart 2: Combined HSI & HHI Futures AHFT Turnover Distribution

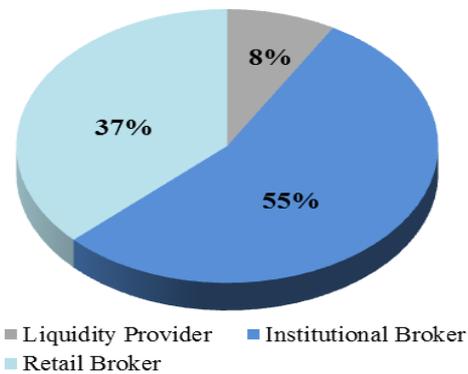


Chart 3: HSI Futures AHFT Turnover Distribution

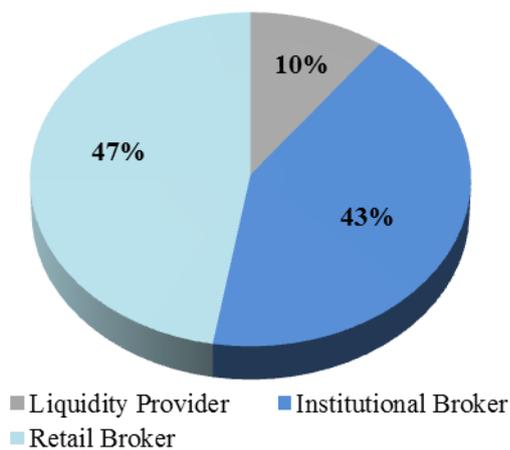
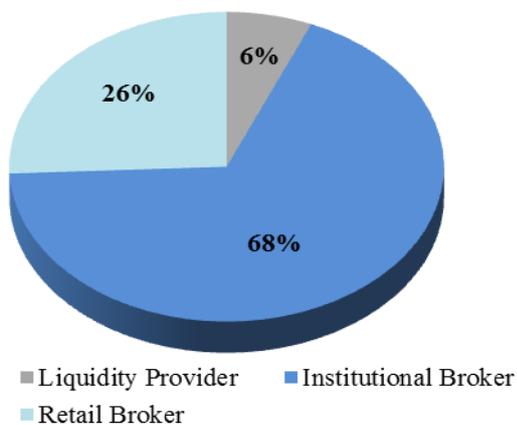


Chart 4: HHI Futures AHFT Turnover Distribution



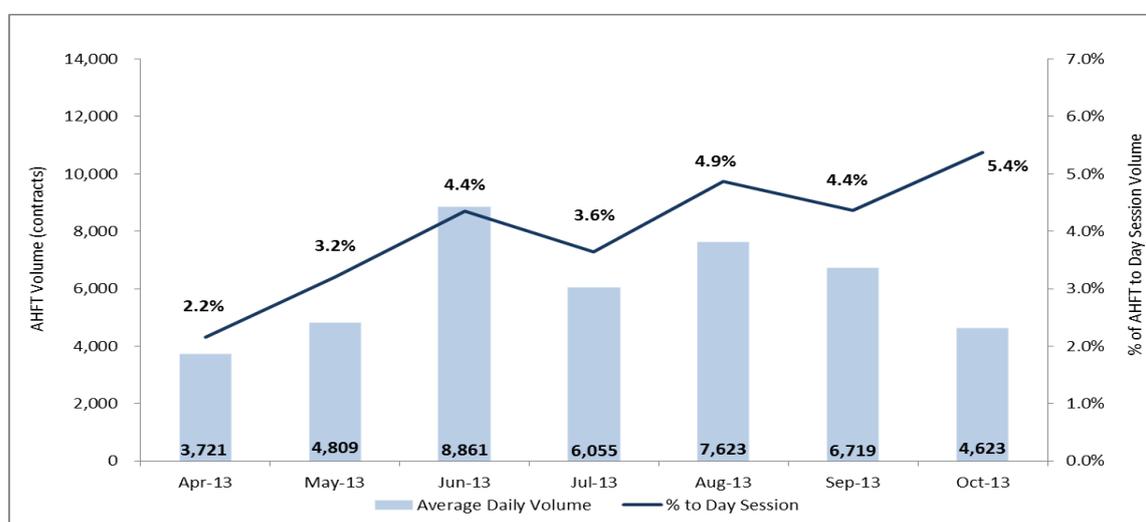
PART C: TRADING ACTIVITIES

19. This section provides a review on the trading volume, intra-day trading distribution, bid / offer spreads and price discovery function of AHFT.

Trading Volume

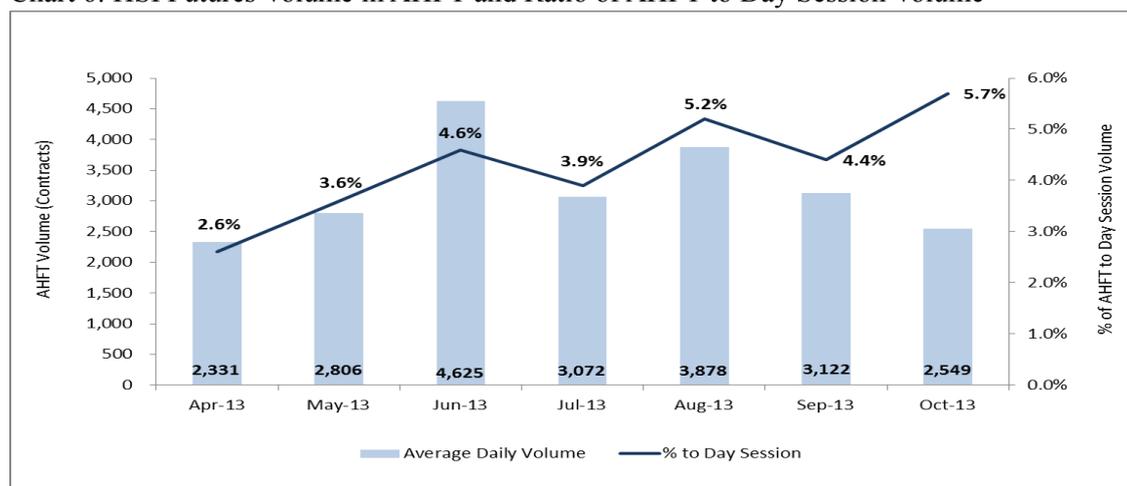
20. During the Review Period, total 773,936 contracts were traded in AHFT Session with average average daily volume (ADV) in AHFT Session to be 6,292 contracts. The record high AHFT volume was 18,813 contracts on 25 June 2013. The percentage of AHFT volume compared to the Day Session volume increased from 2.2% in April to 5.4% in October 2013. The record percentage of AHFT volume compared to the Day Session volume was 9.4% on 6 September 2013. (See Chart 5 for monthly AHFT volume and AHFT volume as a percentage of Day Session volume)

Chart 5: Total HSI and HHI Futures Volume in AHFT and Ratio of AHFT to Day Session Volume



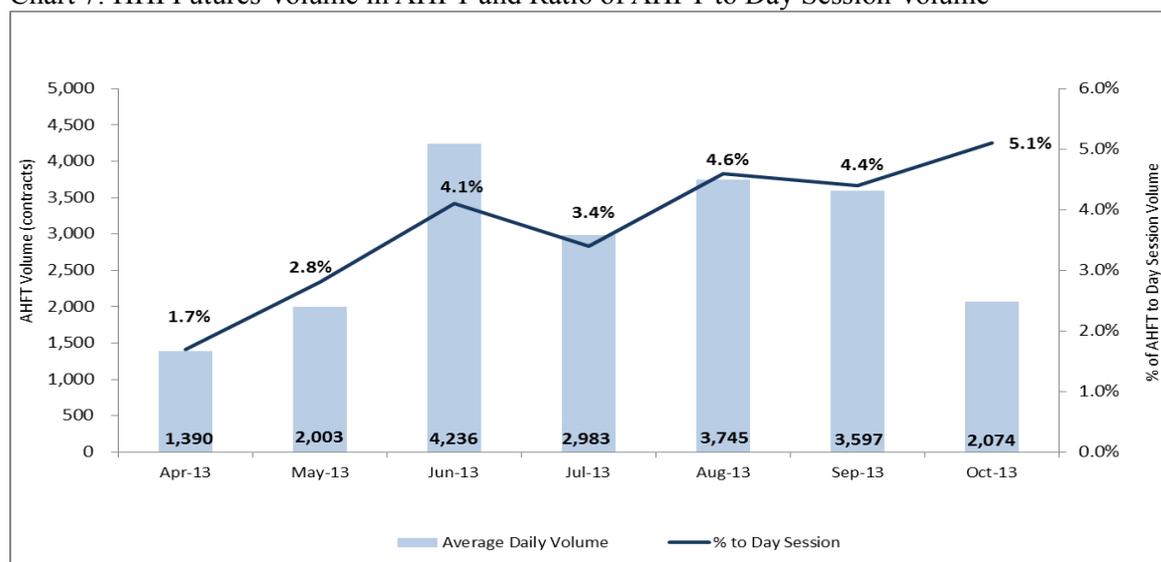
21. For HSI futures, total 405,256 contracts were trading during AHFT session with ADV of 3,295 contracts. The record high AHFT volume was 8,983 contracts on 24 June 2013. The percentage of AHFT volume compared to the day session volume increased from 2.6% in April to 5.7% in October 2013. The record percentage of AHFT volume compared to the Day Session volume was 11.4% on 5 August 2013. (See Chart 6 for monthly HSI futures AHFT volume and its AHFT volume as a percentage of Day Session volume)

Chart 6: HSI Futures Volume in AHFT and Ratio of AHFT to Day Session Volume



22. For HHI futures, total 368,680 contracts were traded during AHFT Session with ADV of 2,997 contracts. The record high AHFT volume was 11,007 contracts on 25 June 2013. The percentage of AHFT volume compared to the day session volume increased from 1.7% in April to 5.1% in October 2013. The record percentage of AHFT volume compared to the day session volume was 9.8% on 6 September 2013. (See Chart 7 for monthly HHI futures AHFT volume and its volume as a percentage of Day Session volume)

Chart 7: HHI Futures Volume in AHFT and Ratio of AHFT to Day Session Volume



23. Highlights of key AHFT trading statistics during the Review Period are as follows:

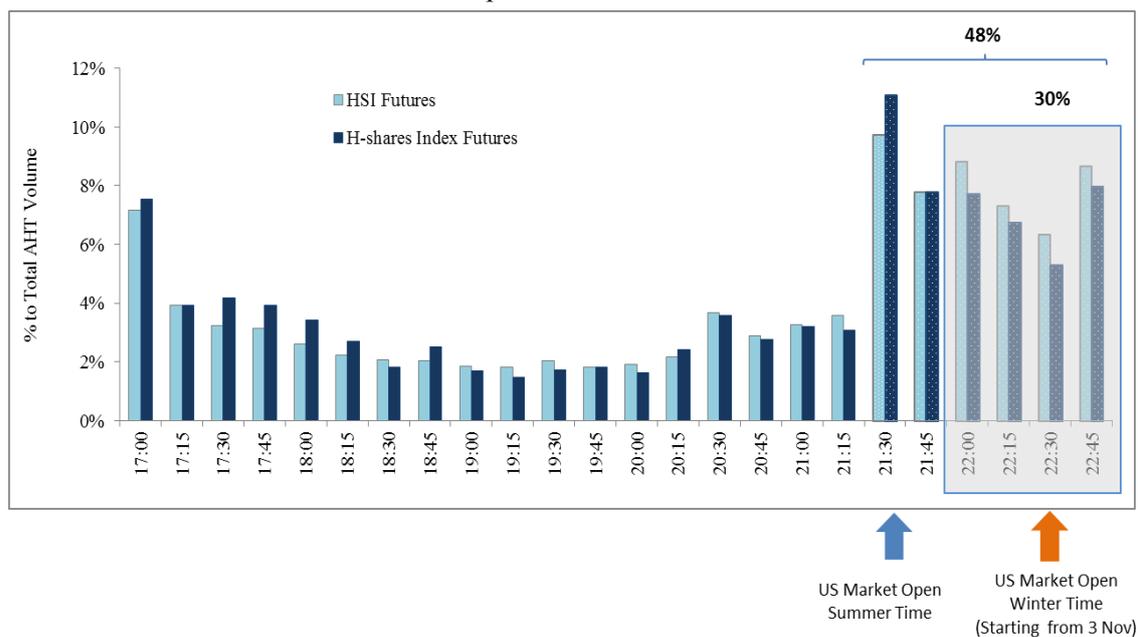
Table 1: Highlight of the Trading Statistics in The Review Period

Statistics (8 April – 7 October 2013)	HSI Futures	HHI Futures	Total
Total Volume (Contracts)	405,256	368,680	773,936
Average Daily Volume (Contracts)	3,295	2,997	6,292
Percentage of Day Session Volume (%)	4.11%	3.58%	3.83%
Record Day AHFT Volume (Contracts)	8,983 (24 June)	11,007 (25 June)	n.a

Intra-day Trading Distribution

24. AHFT trading was more active between 9:30 pm and 11:00 pm (Hong Kong time) after the US market open (i.e. 9:30 pm Hong Kong time), which accounted for 48% of the total AHFT volume. The distribution of trading volumes per 15-minute interval is set forth below.

Chart 8: Distribution of AHFT Volume per 15-minute Interval

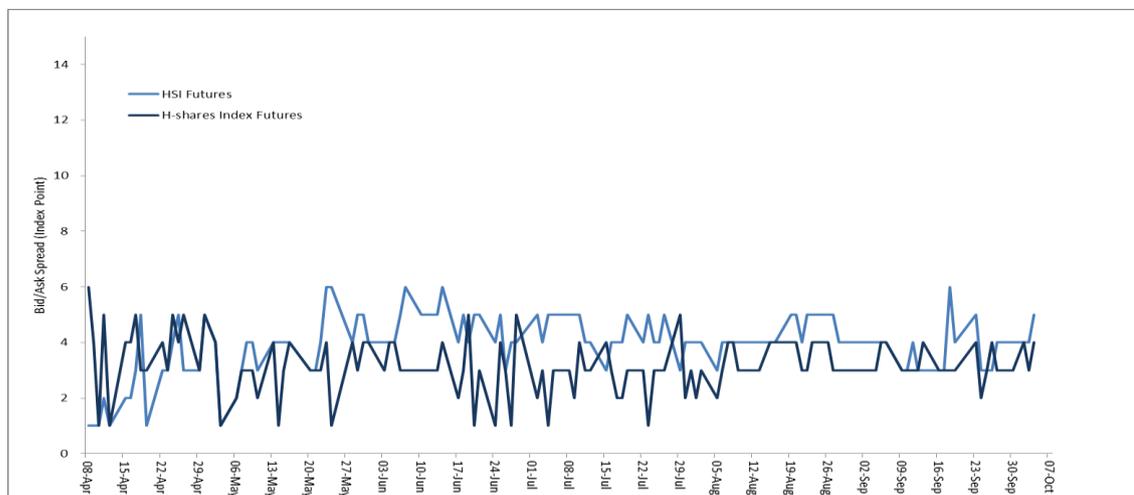


- 25. The last hour of AHFT Session (i.e. 10:00 pm to 11:00 pm) was very active and accounted for 30% of total AHFT volume. However, when the US changes to Winter time (starting from 3 November 2013), i.e. the US market will open at 10:30 pm (Hong Kong time), the overlapping hours of the AHFT Session and the US market shall be reduced from 1.5 hours to 0.5 hours in Winter time. This might result in a potential loss of 30% AHFT volume in Winter.

Bid/Offer Spreads

- 26. With active participation from Participants, the market bid/offer spreads were tight and the most frequently observed bid/offer spread was 4 index points (or 1.7 basis point), which indicated that there was reasonable liquidity in the AHFT Session.

Chart 9: Most Frequent Bid/Offer Spread in AHFT Session



27. Two LPs were appointed to facilitate investors in AHFT with reference bid/offer prices. Both LPs fulfilled their obligations with total market shares accounted for 10% and 6% of HSI futures and HHI futures respectively. LPs are required to provide continuous two-way quotes in the spot month of each product with a bid/offer spread not greater than 20 index points and a quote size not less than 5 contracts for not less than 80% of the trading hours in each month. The frequently observed best bid/offer spreads in the market were 4 index points which were tighter than the maximum LP's obligation of 20 index points. With the growth in market participation, the market spreads indicated that the AHFT Session had become an order-driven market.

Media coverage of AHFT

28. Trading prices during AHFT are valuable information for price discovery that investors will make reference to. There were extensive media reports on the prices and volumes of AHFT in late evening news on TVs and radios, as well as newspaper reports on the next day. In addition, 9 out of 10 major derivatives market data vendors are carrying real-time market data of AHFT session. The list of media and information vendors known to have carried AHFT information are as follows:

Table 2: List of Media Broadcasting AHFT Information

Category	Media Name
Television	TVB, ATV, Now TV, i-Cable
Radio	RTHK, Commercial Radio, Metro-Finance
Newspaper	HK Economic Journal, HK Economic Times, Apple Daily, Oriental Daily
Market Data Vendor	Bloomberg, Reuters, ETNet , Telecom Digital, Infocast, QPI, Realink, AA Stocks, AFE

PART D: MARKET INTEGRITY

29. This section reviews the price movement, the correlation with international markets and the market-wide risk management measures including price limit, mandatory margin and VA calls and monitoring of CBPL during AHFT.

Price Movements in AHFT

30. Trading was orderly in AHFT Session and no excessive price movements were observed. During the Review Period, the maximum movement of AHFT prices compared to the close of Day Session close did not exceed 2.3%. More details of price movement analysis of HSI futures and HHI futures during AHFT Session are as follows:

Table 3: Summary Statistics of Price Movements During AHFT Session

Contract	HSI Futures	HHI Futures
Maximum Movement of AHFT Session high from Day Session close	1.48%	2.22%
Maximum Movement of AHFT Session low from Day Session close	2.03%	2.03%
Maximum AHFT high-low range compared to day session close	2.17%	2.27%

Correlation with International Markets

31. The price movement of the HSI and HHI spot month futures were more correlated to the price movements of major international stock index futures during AHFT Session than that in the Day Session. This suggested that the price movements during AHFT were in line with international markets generally. The summary statistics of the correlation between the price movement of HSI/ HHI spot month futures and major international stock index futures during the Day Session and the AHFT session are set forth in Table 4 below.

Table 4: Price Correlation with International Markets during Day Session and AHFT Session

Correlation with International Futures (Apr – Sep 2013)	HSI futures		HHI Futures	
	Day Session	AHFT Session	Day Session	AHFT Session
FTSE 100 Futures	0.48	0.64	0.43	0.56
EURO STOXX 50 Futures	0.67	0.64	0.58	0.58
S&P 500 Futures	0.58	0.64	0.51	0.55
Nikkei 225 Futures	0.39	0.56	0.35	0.51

Note: based on spot month prices taken at 15-minute interval

Market-wide Risk Management Measures

32. HKEx imposed three additional risk management measures for AHFT, including:
- a) +/-5% price limit in the AHFT Session to limit potential excessive price movements in AHFT;
 - b) New mandatory margin and VA calls in the next morning to safeguard the counterparty risk of Participants resulting from the positions established in AHFT; and
 - c) Monitoring of CBPL of each Participant to observe their compliance to the financial resource requirements during AHFT.
33. The additional risk management measures were proven to be adequate in safeguard the AHFT:
- a) Price limit – The +/-5% price limit was not triggered during the Review Period.
 - b) Mandatory margin and VA calls - There was no default case for Participants to meet the mandatory margin and VA calls.
 - c) Monitoring of CBPL - There was no incident that Participants traded beyond their CBPL during AHFT. During the Review Period, the Clearing House issued two alerts to Participants on their CBPL utilization exceeding 80% of the limit and the cases were swiftly rectified in that evening or in the next trading day.

In addition, the SOS center was not used by Participants.

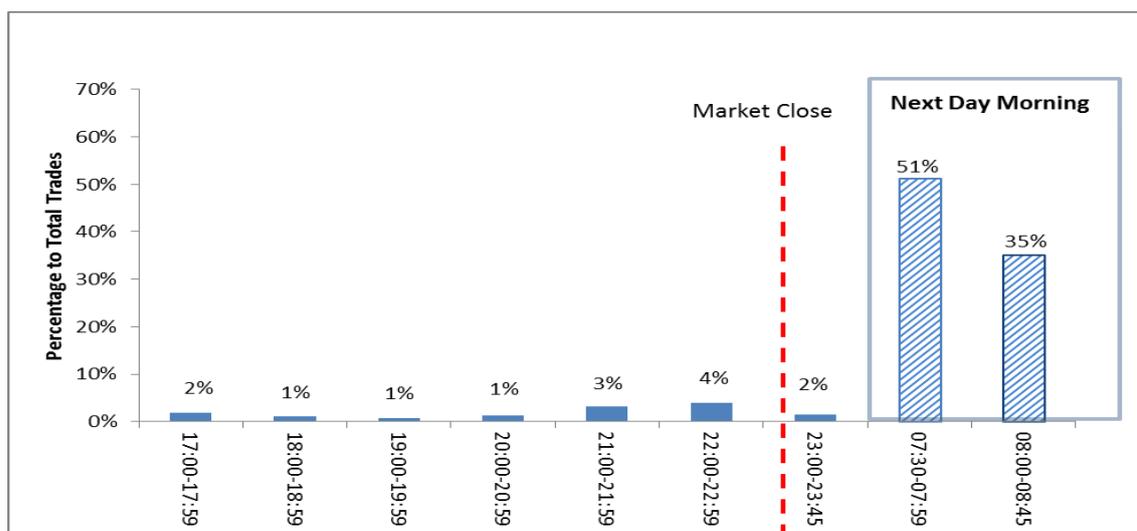
PART E: EXCHANGE PARTICIPANTS / CLEARING PARTICIPANTS' OPERATIONS

34. This section reviews Participants' operations during AHFT, including their post-trade activities and risk management operations in handling the mandatory margin and VA calls.

Post-trade Activities

35. There was limited post-trades after AHFT close - only 2% post-trades were conducted. Most of the post trades were taken place between 7:30 a.m. and 8:45 a.m. on the next day morning, which accounted for 86% of the total post trades.

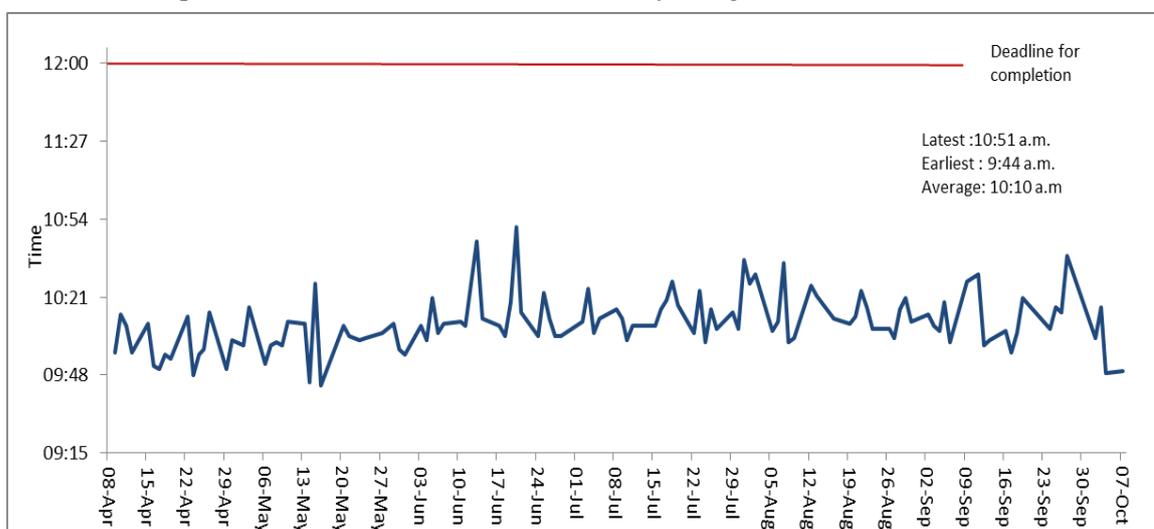
Chart 10: Distribution of Post-trades



Risk Management Operations

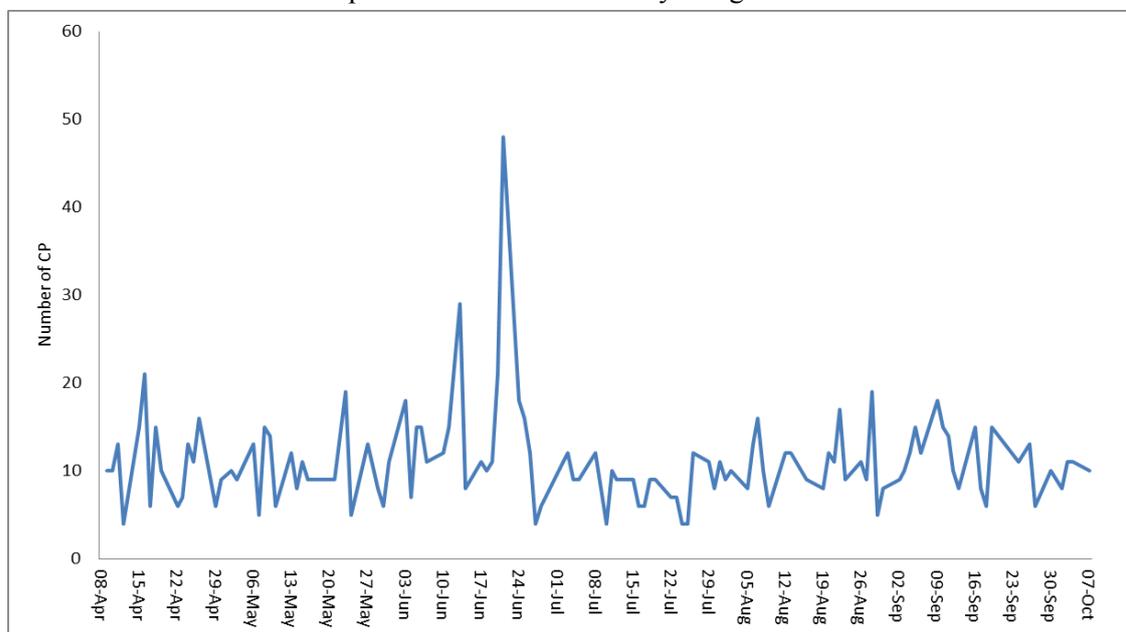
36. Participants met the mandatory margin and VA calls well before the 12:00 noon deadline (earliest by 9:44 am and latest by 10:51 am).

Chart 11: Completion Time for Collection of Mandatory Margin & VA Calls



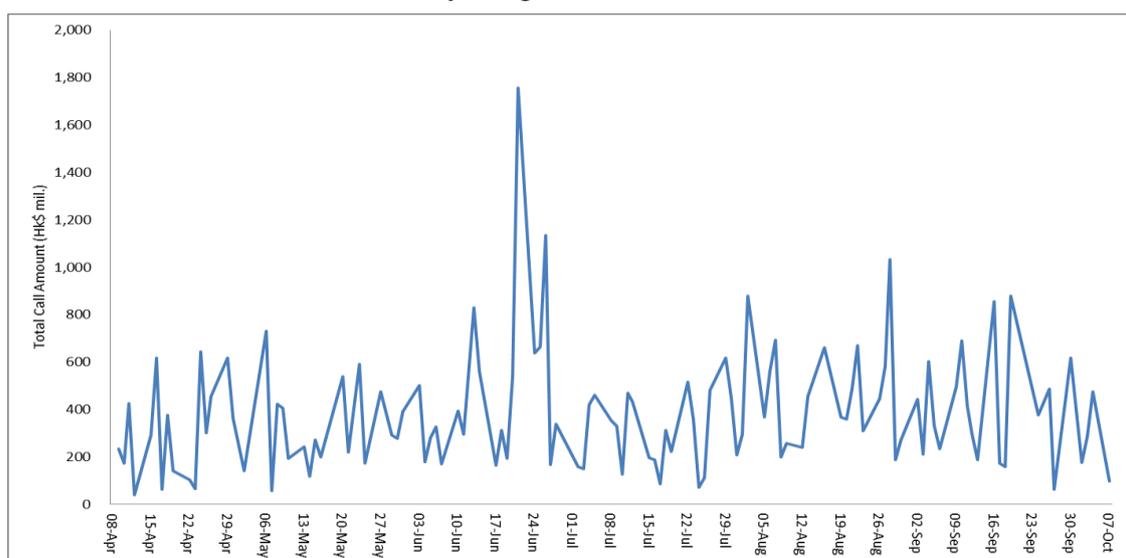
37. The number of Participants being called for mandatory margin and VA calls were limited to active Participants. On average, 11 Participants were being called for mandatory margin and VA. The highest and lowest number of Participants being called on a single day was 48 and 4 respectively.

Chart 12: Number of Participants Called for Mandatory Margin & VA Calls



38. Regarding the total amount of mandatory margin and VA calls required from Participants, on average, HK\$379 million was called in each day. The highest and lowest amount being called for was HK\$1,756 and HK\$39 million respectively. The average amount being called represented for 55% of the amount of the Day End Margin and other Money Obligations being called after the close of the Day Session.

Chart 13: Total Amount of Mandatory Margin & VA Calls



39. From the statistics above, the new mandatory margin and VA calls for AHFT was operated smoothly and there were no incidents encountered. Only a limited number of Participants were affected by the mandatory margin and VA calls and they could handle the margin and VA calls well before the deadline at 12:00 noon.

PART F: MARKET FEEDBACKS

40. Market feedbacks were sought from different types of Participants, including institutional Participants, retail Participants and Participants not yet registered for AHFT, covering a total of 70 Participants with market shares about 75% in HSI futures and HHI futures in 1H, 2013. In general, market feedbacks were positive on AHFT.
41. The feedbacks from Participants registered for AHFT and Participants not registered for AHFT are summarized in Table 5 and 6 below:

Table 5: Feedbacks from Participants Registered for AHFT

Items	Feedbacks from Participants registered for AHFT
Price Movements	<ul style="list-style-type: none"> ● No unusual price movements observed during AHFT
Trading Spreads	<ul style="list-style-type: none"> ● Trading spreads were encouraging
Price Limit	<ul style="list-style-type: none"> ● Most considered the +/-5% price limit should be in place to safeguard the market from excessive movements, if any ● 2 Participants suggested to reduce the price limit from +/-5% to +/-2.5% ● 1 Participant suggested to remove price limit so that their trading operations, such as position squaring, would not be restricted
Operations	<ul style="list-style-type: none"> ● Operations were smooth and no incident reports on the reporting / monitoring of Large Open Positions ● Most of the participating Participants, which had overseas futures business, already had staff supporting night desk operations. Some Participants, which ran Hong Kong futures business only, arranged 2 shifts for existing staff to support AHFT session and only 2 responding Participants hired 1 or 2 new staff in the AHFT session ● One EP used another EP as their execution broker during AHFT
Client Margin Calls	<ul style="list-style-type: none"> ● No issue on client margin calls (some Participants issued margin calls at night and some request pre-trade funding for margin from clients)
Client Statements	<ul style="list-style-type: none"> ● No issue on issuance of client statements (Majority of responding Participants issued client statements based on Day Session closes)

Table 6: Feedbacks from Participants Not Registered for AHFT

Items	Feedbacks from Participants not registered for AHFT
Future Business Plan for AHFT	<ul style="list-style-type: none"> ● Some respondents indicated that they might consider to register for AHFT ● A few of them saw no significant impact on their volume, so they will prefer to remain on the sideline ● Majority of respondents indicated no concerns on the introduction of new products for AHFT

42. Regarding further development of AHFT, Participants' feedbacks are summarized below:

a. Specific to Products

- i. HKEx should add more derivatives products in the AHFT platform to help maximizing the business opportunities for Participants.
- ii. HKEx needs to introduce Mini HSI futures and Mini HHI futures for AHFT so that retail investors can manage their positions in response to overseas market movements at night.
- iii. HKEx should introduce RMB Currency futures in AHFT as RMB becomes more internationalized.
- iv. Some brokers suggested introducing index options in AHFT, but most of the existing index options market makers thought that they were not yet ready to provide market making in AHFT Session.

b. Specific to Trading

- i. HKEx should allow block trades in AHFT to avoid excessive price movements resulted from large order execution.
- ii. As the overlapping of HKEx's AHFT session with the trading hours of US market will be reduced from 1.5 hours to 0.5 hour in Winter time, HKEx needs to extend closing hours of the AHFT Session to midnight to compensate for the potential loss of volume or even further to increase the overlapping.

PART G: CONCLUSION AND WAY FORWARD

43. Trading, clearing and risk management operations of AHFT have been smooth. There were increasing participation and trading volume in AHFT with tight trading spread contributed by both retail and institutional investors. The importance of price discovery function of AHFT is illustrated by the extensive media coverage. No excessive price movements were observed in AHFT and the +/-5% price limit was not triggered. The additional risk management measures are adequate and effective in AHFT session and all Participants fulfilled the mandatory margin and VA call well before the deadline.
44. Given that the AHFT operations are smooth, HKEx will keep the deadline for collection of mandatory margin and VA call from Participants at 12:00 noon unchanged. In addition, the +/-5% price limit for AHFT will be maintained. Regarding the liquidity provider program for HSI futures and HHI futures in AHFT Session which will be expired by the end of December 2013, HKEx has no plan to renew this program as the bid / ask spread in AHFT Session was tight enough to provide price reference for investors.
45. To facilitate investors in managing their exposures in response to European and US market events and to increase business opportunities for Participants, HKEx plans to offer more derivatives products for AHFT in the future.
46. Furthermore, HKEx plans to extend the Day Session block trade facility to AHFT Session. Block trade facility in AHFT Session can facilitate Participants in executing large orders without creating excessive price movements in the AHFT Session.
47. Lastly, HKEx will consider the feasibility of extending the AHFT closing hours to compensate for the loss of the overlapping hour with the US market in Winter time.

