

CONSULTATION PAPER

PROPOSAL FOR INTRODUCTION OF
VOLATILITY CONTROL MECHANISM IN
THE SECURITIES AND DERIVATIVES MARKETS
AND CLOSING AUCTION SESSION IN
THE SECURITIES MARKET

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EXECUTIVE SUMMARY

1. This Consultation Paper seeks views and comments from all interested parties regarding the proposed introduction of a Volatility Control Mechanism (VCM) in the securities and derivatives markets and a Closing Auction Session (CAS) in the securities market in Hong Kong.
2. The two proposals to enhance the market microstructure are aimed at improving the global competitiveness of the Hong Kong market. The VCM is needed to contain systemic risk caused by extreme price volatility in both the securities and derivatives markets, in line with international regulatory guidance and trading practice, while the CAS is needed to meet the diverse needs of investors for the securities market by allowing execution at the closing price.

Volatility Control Mechanism

3. In view of the impact of technological change on market integrity and efficiency, the International Organisation of Securities Commissions (IOSCO) has issued guidance on implementing volatility control mechanisms in trading venues, with the objective of preventing major trading incidents such as the Flash Crash seen in the US market. Many international exchanges have also implemented some forms of volatility control mechanism to contain systemic risk caused by extreme price movement. As a market operator, it is HKEx's statutory duty to safeguard market integrity in the context of changing market conditions.
4. Based on the IOSCO guidance, the VCM should address systemic risks arising from the inter-connectedness of securities and derivatives markets, particularly with respect to index products. Furthermore, a VCM model with a temporary cooling-off period would be effective by allowing market participants to reassess their strategies and reset their algorithm parameters, as well as the re-establishment of an orderly market during volatile market situations. As such, the VCM model considered here should be distinguished from other models such as circuit breakers which halt market trading or static daily price limits which set a fixed price range for trading, as seen in some other markets.
5. Consideration has also been given to the type of VCM model would be suitable for Hong Kong. Based on some preliminary discussions with the market, a light-touch and simple model would be preferable for Hong Kong as the first step, since VCM would be new to the market, and participants and investors may not be familiar with such mechanisms.
6. Accordingly, HKEx has developed a dynamic price limit VCM model for the securities and derivatives markets, which would trigger a cooling-off period in case of abrupt price volatility detected at the instrument level. This model is preferred because it is relatively simple and minimises market interruption.
7. In accordance with IOSCO's guidance, HKEx would focus on instruments that pose systemic risks arising from the inter-connectedness of securities and derivatives markets, particularly with respect to index products. Therefore, the VCM model is proposed to

be applied to Hang Seng Index (HSI) and Hang Seng China Enterprise Index (HSCEI) constituent stocks in the securities market, and Hang Seng Index (HSI), Mini-Hang Seng Index (MHI), H-shares Index (HHI) and Mini H-shares Index (MCH) (spot month and the next calendar month) futures in the derivatives market.

8. The proposed VCM is summarised as follows:

- During the Continuous Trading Session (CTS), order execution of each instrument subject to VCM (VCM Instrument) would be monitored against a dynamic price limit of $\pm 10\%$ ($\pm 5\%$) from the last trade 5 minutes ago¹ in the securities (derivatives) market.
- If the potential execution price falls outside of the price limit, the order would be rejected, and a 5-minute cooling-off period would start immediately. The instrument would only be allowed to trade within a fixed price limit (the same price limit right before the VCM trigger) during this cooling-off period. High bid and low ask orders (otherwise known as aggressive orders) violating the upper and lower price limits would also be rejected immediately during the cooling-off period.
- The same dynamic price limit monitoring mechanism (i.e. $\pm 10\%$ ($\pm 5\%$) from the last trade 5 minutes ago in the securities (derivatives) market) will resume after the cooling-off period. If there is no trading in the cooling-off period, the first trade can be executed without any price limit applied.
- For each VCM Instrument, there would be a maximum of two VCM triggers in a single trading session (Morning Session and Afternoon Session are counted as two separate trading sessions), with the VCM monitoring completely relaxed in that trading session upon expiry of the second cooling-off period.
- The VCM would not be in effect in the last 15 minutes of the CTS² to allow for efficient price discovery at market close and to avoid potentially preventing investors from closing out their positions and being forced to take overnight risks. After Hours Futures Trading in the derivatives markets would also be excluded from the VCM, as it already has a static price limit of $\pm 5\%$ from the last traded price in the day session.
- When there is a VCM triggered, the trading of linked instruments or other instruments with the same underlying would not be affected.

¹ This refers to the last trade of the instrument five minutes prior to the current potential trade.

² The VCM monitoring would stop 20 minutes before the end of CTS as the duration of a cooling-off period is 5 minutes.

9. The details of the VCM model are set out in Chapter 2.

Closing Auction Session

10. Hong Kong is an international market with participants and investors from all over the world. Over 500 Exchange Participants (EPs) from origins spanning the globe come to trade in Hong Kong, and they bring both international and local investors to us. Some 60% of trading value is from institutional investors, 23% is from retail investors, and the remainder is from EPs' principal trading³. Some institutional investors and index trackers in particular are mandated to execute at the closing price, and a significant amount of securities market order flow comes from these market participants every day and especially on index rebalancing days.
11. Market feedback indicates that Hong Kong's current trading methodology does not support execution at closing price. The issue has led to index tracking errors, which in turn undermines the performance of investment funds and is ultimately borne by their investors such as pension funds and retail investors. Internationally, almost all securities markets have already adopted closing auction as an effective way to facilitate execution at market close. As such, many market participants have been requesting the introduction of a CAS in Hong Kong for some years.
12. A CAS was introduced in the Hong Kong securities market in 2008. However, large price movements during the CAS were observed on certain days and in certain securities. Accordingly, the previous CAS was suspended in March 2009 in order to restore investor confidence.
13. Nonetheless, market participants have continued to request a CAS in order to execute Market-on-Close (MOC) Orders⁴. A new and improved CAS model has therefore been developed which would address the issues that were experienced with the previous CAS.
14. As an initial phase, the proposed new CAS model would only be applied to securities which require execution at market close, namely the major index constituent stocks (which for this purpose would be taken as the constituent stocks of the Hang Seng Composite LargeCap Index and Hang Seng Composite MidCap Index as well as other Stock Connect Securities for southbound trading) and ETFs with Hong Kong stocks as underlying (collectively known as CAS Securities). The closing mechanism of other securities would remain unchanged. Subject to market feedback after its implementation, the CAS model may be further expanded in the second phase to cover all equity securities and funds but still excluding structured products, equity warrants and debt securities.

³ Source: Cash Market Transaction Survey 2012/13
(<http://www.hkex.com.hk/eng/stat/research/Documents/cmts2013.pdf>)

⁴ Market-on-Close Order is an order with the objective to trade at the closing price.

15. The new CAS model would consist of four periods:
- In the first period (Blocking Period), a reference price, which sets the allowable price limit of the CAS ($\pm 5\%$ from the reference price), would be calculated for each CAS Security.
 - In the second period (Order Input Period), at-auction orders and at-auction limit orders within the $\pm 5\%$ price limit could be input, amended or cancelled.
 - Starting from the third period (No-Cancellation Period), prices of the new at-auction limit orders would only be permitted within the lowest ask and highest bid of the order book, and no orders could be amended or cancelled.
 - In the last period (Random Closing Period), while the order rules would follow the preceding period, the market would randomly close within 2 minutes followed by order matching of all CAS Securities.
16. The proposed new CAS model aims to facilitate a smooth price discovery process while at the same time addressing the price instability issue observed in the last CAS.
17. The details of the new CAS model are set out in Chapter 7.

Timeline and responses to the Consultation Paper

18. The proposed introduction of the VCM and the CAS constitute the major market reforms of the Hong Kong market microstructure planned for the near to medium term. These proposals, if adopted and subject to market feedback, may be implemented in conjunction with the enhancement of the Trading Halts mechanism in the securities market which was the subject of a separate consultation with conclusions published in March 2013. The implementation of the VCM in the derivatives market would be independent from the securities market as derivatives products are traded on a different platform. The proposed implementation approach for the VCM, CAS and Trading Halts in the securities market is set out in Chapter 10.
19. If these proposals were to be implemented, market participants would be given adequate preparation time (e.g. one year from the publication of the consultation conclusions) to prepare for the necessary system changes. Market education programmes would also be provided to help the market understand the new trading mechanisms. HKEx will work with the Securities and Futures Commission (SFC) to cater for any new market monitoring and surveillance functions required.
20. We invite market participants and the investing public to express their views and comments on the two proposals. Respondents should reply to this Consultation Paper by completing and returning the questionnaire on or before 10 April 2015 (a softcopy of the questionnaire is available at <http://www.hkex.com.hk/eng/newsconsul/mktconsul/Documents/cp201501q.doc>)
21. A Consultation Conclusions Paper would be issued in the first half of 2015 summarising the main points made by the respondents and indicating the way forward.

PART A

VOLATILITY CONTROL MECHANISM (VCM)

CHAPTER 1: BACKGROUND AND REASONS FOR VCM

22. Chapters 1 to 4 of this Consultation Paper set out the rationale for and the details of HKEx's proposal to introduce an instrument-level dynamic price limit Volatility Control Mechanism (VCM) for both the securities and derivatives markets.

Background

23. Over the past decade, trading via algorithms, the increasing immediacy of information and the interconnectedness of different markets and products have changed the way people trade and provided new opportunities for fulfilment of trading strategies. At the same time, these new trading methods have increased the risks to market integrity and orderliness. In overseas markets, there have been trading incidents caused by rapid market movements, such as the US' 'Flash Crash' incident in May 2010, creating over-reaction and impacting market integrity.
24. Based on a review initiated by the G20 in November 2010 and IOSCO's report on "Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency" published in October 2011, there is an international consensus that regulators should seek to ensure that trading venues have in place suitable VCMs to deal with volatile market conditions. Meanwhile, a number of major exchanges have been implementing measures to temper volatility and safeguard market integrity from the risk of rapid market movement.
25. In the Hong Kong market, the aforementioned problems in overseas markets are not present. In Hong Kong there is only a single market, so inter-venue and arbitrage trading do not take place. Moreover, stamp duty in the securities market, at 10 basis points per side, makes marginal arbitrage trades unprofitable. So far, major trading incidents on the scale of the 'Flash Crash' have not occurred in Hong Kong.
26. In view of regulatory guidance and international practice, there is a need to review whether some form of VCM is necessary in the Hong Kong market, with the objective of safeguarding the market against disorderliness caused by extreme price volatility.
27. Based on the IOSCO guidance, a VCM should contain systemic risks arising from advances in trading technology such as algorithmic trading, and from the inter-connectedness of securities and derivatives markets, particularly with respect to benchmark index products. A VCM model with a temporary cooling-off period would allow market participants to reassess their strategies, allow algorithm parameters to be reset, and enable an orderly market to be re-established during volatile market situations.
28. The VCM model proposed here should be distinguished from other models seen in other markets such as circuit breakers which halt market trading or static price limit which sets a fixed daily price limit for trading. Also, the VCM is not primarily designed for preventing erroneous trades, which remains to be the responsibility of investors and brokers.

Objectives and design principles of VCM

29. The objective of the proposed VCM is to address systemic risks arising from volatile market situations. The VCM should provide a temporary cooling-off period for market participants and investors in the event of extreme price volatility. Such extreme price volatility could be due to non-fundamental events such as faulty algorithms and trading errors, whereupon the cooling-off period should give time for reflection and minimise the chance of market overreaction or panic. However, extreme price volatility could also be due to fundamental events, so interruption to the market's normal price discovery function should be minimised.
30. While it is important to choose a VCM model that meets the above objectives of addressing systemic risks and minimising trading interruption, consideration should also be given to the Hong Kong market's specific circumstances. For example, Hong Kong has never had any kind of VCM before, so introducing it would mean increased complexity and a steep learning curve for market participants. Additionally, the free-market philosophy is deeply-rooted in Hong Kong, so many market participants and investors would prefer little or no interruption to trading. Therefore, a light-touch and simple VCM model would appear the most appropriate, at least until experience has been gathered and/or the need for a more sophisticated mechanism has become apparent.

Types of VCM

31. Based on the IOSCO report, there are generally three types of VCM:
 - **Circuit Breakers:** These are market-wide interventions which suspend or halt market trading upon major index declines. An example is the market-wide circuit breaker in the US market which halts market trading on all venues upon significant declines in the S&P 500 Index. While market-wide circuit breakers have the merit of simplicity, if triggered, they cause significant market interruption. Moreover, a market-wide circuit breaker is triggered only in case of overall market volatility but not in the event of volatility of individual instruments.
 - **Trading Limitations:** These are volatility interruptions which immediately stop continuous trading and switch to auction mode during extreme volatility. This model is typically adopted in European markets. Based on the European experience, the model has caused some degree of trading interruption in those markets, and the mechanics are usually more complex with random end and multiple auction extensions.
 - **Price Limit:** This is an automated price volatility safeguard mechanism which imposes a temporary trading restriction on the trading of a major equity product or index, in case of extreme and uncontrolled price volatility that moves prices beyond a pre-set price threshold or limit. Compared to the other models, this model appears to cause the least market interruption and is relatively simpler.
32. In view of regulatory guidance and market feedback, a dynamic price limit model, applied to major instruments in the securities and derivatives markets, is proposed; it

should address the systemic risks and is relatively easier for investors to understand. The following chapter discusses the detailed features of the proposed VCM model.

CHAPTER 2: PROPOSED VCM MODEL

33. This chapter sets out details of the VCM model for consultation. International practice on VCM models is also attached in Appendix I for reference, and the rationale and key questions for consultation are outlined in Chapter 3.

Applicable instruments for VCM

34. The proposed VCM would only be applicable to the following instruments in the securities and derivatives markets:

- **Securities market:** HSI & HSCEI index constituent stocks, which covers about 60% of equities' turnover; and
- **Derivatives market:** HSI, HHI, MHI & MCH (spot month and the next calendar month) futures, which covers about 90% of trading volume in the futures market.

Applicable trading session for VCM model

35. The VCM model should be applied to the CTS only except for the last 15 minutes. This means that the VCM monitoring would stop 20 minutes before the end of the Afternoon Session as the duration of a cooling-off period is 5 minutes. The VCM will be applicable to the whole Morning Session.

High level description of VCM process flow

36. The proposed VCM model is shown in Figure 1 and set out in paragraphs 37 to 41 below.

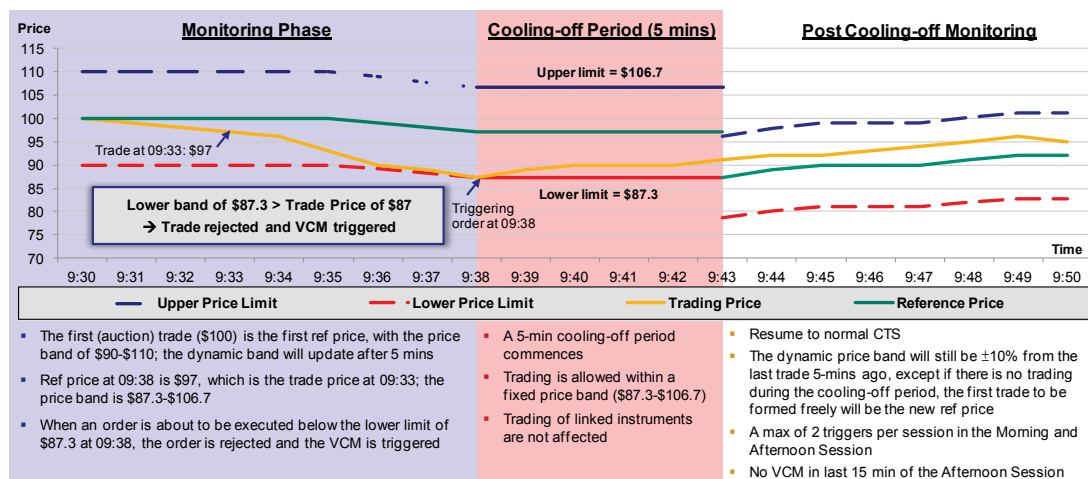


Figure 1: Proposed design of VCM

37. During the CTS, the potential trade price of an applicable instrument would be continuously checked against a price limit ($\pm 10\%$ for securities and $\pm 5\%$ for derivatives) based upon a dynamically updated reference price, the last traded price 5 minutes ago. The timestamp of the reference price (i.e. 5 minutes ago) and the magnitude of change

(i.e. $\pm 10\%$ for securities and $\pm 5\%$ for derivatives) would be used to measure the velocity of price change and hence gauge how abrupt and sudden the price volatility is.

38. If the potential execution price falls outside the price limit, the order would be rejected, and a 5-minute cooling-off period would start immediately. The market would be alerted to the cooling-off period and have time for reflection and review of positions.
39. During the cooling-off period, the instrument would only be able to trade within the price limit set before the cooling-off period. Any incoming aggressive orders outside the price limit would be rejected immediately. Passive orders outside the price limit would continue to be allowed to be input to build up order depth.
40. The same dynamic price limit monitoring mechanism (i.e. $\pm 10\%$ ($\pm 5\%$) from the last trade 5 minutes ago in the securities (derivatives) market) will resume after the cooling-off period. If there is no trading during the cooling-off period, the first trade can be executed without any price limit applied.
41. For each VCM Instrument, there would be a maximum of two VCM triggers in a single trading session (i.e. Morning or Afternoon Session), meaning that VCM monitoring for that trading session would cease for the triggered instrument after the second cooling-off period.

Others features

Order price validation

42. The normal order validation rules such as the quotation rules in the securities market and dynamic price banding in the derivatives market for continuous trading would continue to apply.

Market data dissemination

43. Once a VCM is triggered, the reference price, upper and lower price limit, trading state and time of VCM expiry/resumption would be disseminated through the market data feed to enable market participants to make informed choices. In addition, there would be a flag in the market data feed indicating whether the instrument is a VCM instrument.

Inter-market/ product connectivity

44. All instruments would be treated independently, i.e. the trading of related instruments and derivatives would remain unaffected when a VCM is triggered for their underlyings.
45. HKEx understands that market makers may have difficulties fulfilling their market making obligations for an instrument, when a VCM is triggered for its underlying. In view of this, market makers may request to waive or relax their market making obligations, in accordance with the existing policies and procedures as appropriate.

46. The key features of the proposed VCM are summarised in the table in Appendix II.

CHAPTER 3: DISCUSSION AND CONSULTATION QUESTIONS ON THE PROPOSED VCM

47. This chapter further explains the rationale for the proposed VCM and seeks the market’s comments on the proposal.

Type of VCM

48. In the proposed model, a VCM would be applied at the instrument-level with a dynamic reference price and price limit. The proposed model aims to safeguard market integrity from extreme price volatility in individual instruments, which would in turn mitigate volatility in the market as a whole. The model would not affect normal trading of other instruments, i.e. it would be less disruptive than a market-level model.

49. Internationally, it is observed that most exchanges in the US, European and Asian markets have an instrument-level VCM. Only a few exchanges have additionally implemented a market-level VCM.

Consultation Questions

Q1: Do you support the introduction of an instrument-level VCM based on a dynamic price limit model in Hong Kong? Please give reasons for your view.

Applicable instrument types

50. Based on IOSCO’s guidance, the VCM model should address systemic risks caused by the interconnectedness of the securities and derivatives markets, in particular with respect to index products. It is proposed to apply the VCM to the key index-related products only, i.e. HSI and HSCEI index constituent stocks for the securities market, and the HSI, HHI, MHI and MCH (spot month and the next calendar month) index futures in the derivatives market. Based on the diagram below, these are the instruments which may pose the highest systemic risks.

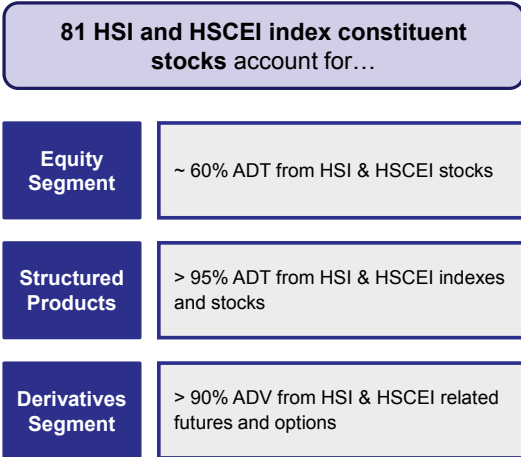


Figure 2: Turnover analysis in the securities and derivatives markets

51. Based on back test statistics on 9-year HKEx trade data, the proposed VCM would have been triggered 40 times per annum in the securities market and 3 times per annum in the derivatives market⁵. However, most of these VCM triggers occurred in the more volatile periods. For example, over 90% of the VCM triggers in the securities market happened during 1997/98 and 2007/08, and 75% of the VCM triggers in the derivatives market happened during 2008. In comparison, the VCM triggers in the less volatile periods were relatively infrequent. Hence, the level of trading interruption that is expected with the proposed VCM should not be excessive.

Consultation Questions

- Q2: Do you agree that the proposed VCM model should only be applied to the HSI and HSCEI constituent stocks in the securities market? Please give reasons for your view.
- Q3: Do you agree that the proposed VCM model should only be applied to the HSI, HHI, MHI and MCH (spot month and the next calendar month) index futures in the derivatives market? Please give reasons for your view.

Applicable trading session

52. The VCM is proposed to cover the CTS only (i.e. excluding the auction sessions for both markets and AHFT session for the derivatives market). A VCM is not considered necessary for the auction sessions because they have a different price discovery process, and price volatility controls are already incorporated in the auction design. As for the AHFT session in the derivatives market, a static price limit is already in place, so a VCM is not required.
53. In addition, the VCM's cooling-off period would not be in effect during the last 15 minutes of CTS, meaning that the VCM monitoring would stop at 20 minutes before the end of CTS. This proposal would provide an uninterrupted 15-minute period of trading before the end of CTS so that investors could unwind their day positions and avoid taking overnight risks. This arrangement would apply to both the securities and derivatives market, and the implementation of the CAS in the securities market would not change the proposed arrangement.
54. Internationally, most exchanges apply the VCM only in the CTS.

Consultation Questions

- Q4: Do you agree that the market should have a 15-minute uninterrupted trading period before the end of the last continuous trading? Please give reasons for your view.

⁵ In the back test conducted, the number of triggers refers to the number of VCM incidents in terms of security-day, i.e. even if a security may have multiple triggers in a single day it would have been counted as a single VCM incident, as trading behaviour after VCM triggers could not be predicted or simulated in the back test.

Applicable trade type

55. HKEx is of the view that the VCM should be applicable to automatched trades only but not to manual trades, which are concluded off-market and reported back to the Exchange. Since these manual trades do not participate in order matching on the Exchange platform, they may not affect price formation of the market.

Reference price and triggering level for setting the price limit

56. In a VCM model, a price limit is required for continuous monitoring of potential trade prices. A reference price and a triggering level based on this price are used to establish the price limit.

Reference price

57. The reference price can be a dynamically updated price such as the last traded price, the last traded price a few minutes ago, the average trade price over the previous few minutes or a static price such as the previous closing price and day opening price.

58. The price of the last trade 5 minutes ago is proposed to be used as the reference price, which is a dynamic price for capturing both the magnitude and speed of sudden price changes of individual instruments, with the following reasons⁶:

- A static reference price is not preferred as it may come from a price established long time ago and hence not relevant anymore; and
- A too-recent reference price such as the last traded price is also not preferred because it would make the VCM insensitive to price changes in liquid instruments that typically require a large number of trades to move the price.

59. Back test analysis covering 9 years of trading data (1997 to 1998 and 2007 to 2013) has been conducted for different reference prices. The results can be summarised as follow:

- **Securities market** – The number of VCM triggers per year for the proposed model would reduce from 40 to 30 triggers, if the reference price were changed from the price of last trade 5 minutes ago to 3 minutes ago; or increase from 40 to 64 triggers, if the reference price were changed to the price of last trade 10 minutes ago.
- **Derivatives market** – The use of a reference price with a shorter monitoring time window can lower the number of triggers per year – for example from 3 triggers per

⁶ Please note that the reference price may vary under special circumstances, such as the first reference price of each trading session, those in the subsequent 5 minutes, and the reference price after the cooling-off period. Besides, the trade price in the auctions and the first trade price in the Afternoon Session of the securities market would never trigger a VCM. Please refer to Appendix II for more details.

year where the dynamic price is the price of the last trade 5 minutes ago to 2 triggers when using the price of last trade 3 minutes ago, or to 1 trigger for price of last trade 1 second ago. The same reference price model – i.e. the price of the last trade 5 minutes ago – for both the securities and derivatives markets is preferred for simplicity's sake.

60. Internationally, the VCM models established recently in the US and SGX securities markets use similar reference prices. The US markets use the average trade price in the previous 5 minutes, while SGX uses the price of last trade 5 minutes ago, which is similar to the US model but is simpler to implement and has a smaller impact on latency.

Consultation Questions

- Q5: Do you agree with the proposed reference price for the securities market, namely the price of last trade 5 minutes ago? If not, what would you prefer? Please give reasons for your view.
- Q6: Do you agree with our proposed reference price for the derivatives market, namely the price of last trade 5 minutes ago? If not, what would you prefer? Please give reasons for your view.

Triggering level

61. The triggering level is proposed to be 10% for the securities market and 5% for the derivatives market. A lower triggering level is proposed for the derivatives market because its applicable instruments are at the basket level (rather than at the individual stock level as in the securities market); therefore, a lower percentage change in prices of index series would imply a much bigger market impact than in the case of individual stocks. The 5% triggering level is also equivalent to around 1.5 times the existing error trade parameter in the index futures market (i.e. 3%).
62. An alternative approach would be to apply different triggering levels for different products (e.g. lower triggering level for more liquid instruments and vice versa) or for different price ranges (e.g. higher triggering level for lower-priced instruments and vice versa). However, such approach is not preferred as it introduces additional complexity and may cause market confusion.
63. Based on back test results on the proposed model, the number of VCM triggers per year in the securities market would increase from 40 to 542, if the triggering level were set at 5%, or reduce from 40 to 2, if the triggering level were set at 20%. For the derivatives market, the number of VCM occurrences per year would increase from 3 to 24 or reduce to 0 if the triggering level were set at 3% and 10% respectively.
64. For the international securities markets, SGX also uses a 10% triggering level, while other securities exchanges use different triggering levels that range from 2% to 100%. For the derivatives market, different exchanges use different triggering levels for different products, and no clear pattern is observed.

Consultation Questions

- Q7: Do you agree with the proposed triggering level for the securities market, namely 10% from the reference price across the proposed instruments covered by the VCM? If not, what level would you prefer? Please give reasons for your view.
- Q8: Do you agree with the proposed triggering level for the derivatives market, namely 5% from the reference price across the proposed instruments covered by the VCM? If not, what level would you prefer? Please give reasons for your view.

Maximum number of VCM triggers per trading session

65. The proposed VCM model would impose a maximum of two triggers per trading session per instrument. This approach would ensure that while the market would still be alerted to the unusual volatile situation, trading interruption would be kept to a maximum of 10 minutes (i.e. 2 cooling-off periods) per trading session.
66. It should however be noted that the VCM models in overseas markets generally allow multiple triggers, but these markets are also more mature in their VCM development. As Hong Kong market participants may be new to the idea of a VCM, a light-touch approach would be preferred initially, although multiple triggering features can be built into the system and turned on at a later stage if the market is ready to adopt a more sophisticated approach.

Consultation Questions

- Q9: Do you agree that a maximum of two VCM triggers per trading session per instrument should be imposed to minimise market interruption? Please give reasons for your view.

Cooling-off and resumption procedures

67. The proposed VCM model would provide a 5-minute cooling-off period during which normal trading would be allowed as long as trades are concluded within the price limit. New aggressive orders (i.e. high bids and low asks) violating the price limit would be rejected immediately, but other order input/amend/cancel operations would be allowed as normal. The reference price would not be refreshed in the cooling-off period.
68. The same dynamic price limit monitoring mechanism (i.e. $\pm 10\%$ ($\pm 5\%$) from the last trade 5 minutes ago in the securities (derivatives) market) will resume after the cooling-off period. If there is no trading during the cooling-off period, the first trade can be executed without any price limit applied.
69. Consideration has been given to some more complicated enhancement features, such as extending the cooling-off period or widening the triggering level when there is no trading during the cooling-off period. However, the introduction of VCM is already a complication of the market to which market participants would take time to adapt. A simple and light-touch model is therefore preferred as a first step.

Consultation Questions

- Q10: Do you support trading within a price limit during the cooling-off period? If not, do you prefer another approach? Please give reasons for your view.
- Q11: After the cooling-off period, do you support resuming the same dynamic price limit monitoring mechanism (i.e. $\pm 10\%$ ($\pm 5\%$) from the last trade 5 minutes ago in the securities (derivatives) market)? If not, do you prefer another approach? Please give reasons for your view.
- Q12: Do you have any other suggestions on enhancing the resumption procedures?

Duration of cooling-off period

70. The duration of the cooling-off period is proposed to be 5 minutes. The rationale is that the duration should be long enough for algorithmic or fat finger errors to become apparent, and for market participants to assimilate information and make informed choices accordingly; on the other hand, the duration should be short enough not to cause undue market interruption. It is understood that 5 minutes may not be long enough for investors to digest news connected with fundamental price movements; however, the VCM is not intended to cover such cases. In the event of price movement driven by fundamentals, trading should resume as soon as possible.
71. Internationally, a few securities exchanges such as those in the US, the LSE and SGX also adopt a 5-minute cooling-off period, whereas ASX has a shorter cooling-off period (2 minutes). In the case of derivatives markets, for exchanges using dynamic price limits, their cooling-off periods tend to be shorter (30 seconds or less), similar to the time interval of which the reference price is updated. However for Hong Kong, it is proposed to align the model for both the securities and derivatives markets for simplicity sake, i.e. both markets should have a cooling-off period of 5 minutes.

Consultation Questions

- Q13: Do you agree that the duration of the cooling-off period should be 5 minutes for both the securities and derivatives markets? If not, what would you prefer and why? Please give reasons for your view.

Market data dissemination

72. After a VCM is triggered, the reference price, price limit, trading state and time of VCM expiry/resumption would be disseminated via market data feed to enable market participants to make informed decisions and to provide better transparency.
73. However, the aforementioned market data would not be disseminated when a VCM is not triggered in order to avoid information overload and possible confusion to the market. Changes to the market should be kept the minimum under the proposed VCM model.

Consultation Questions

Q14: Do you agree with the additional market data dissemination for the proposed VCM model? If not, what would you propose and why? Please give reasons for your view.

Inter-connectivity between linked instruments

74. HKEx is of the view that all instruments should be treated independently in order to minimise market interruption. If a VCM has been triggered for a given instrument, it does not necessarily mean that a VCM should be triggered for its linked instruments as the latter may be trading normally. In any case, if the linked instruments are systemically important, they would be subject to their own respective VCM. Furthermore, restricting or suspending trading of the linked instruments may hamper investors' ability to manage their risk positions.
75. It is understood that there may be risks of abnormal trading in relation to warrants and single stock options if the trading of the underlying is restricted. If a VCM is triggered for an instrument, Market Makers of related instruments may not be able to fulfill their obligations. As such, Market Makers may submit a request to waive or relax their market making obligations, in accordance with the existing policies and procedures as appropriate.

Consultation Questions

Q15: If a VCM is triggered for a given instrument, should trading of related instrument (e.g. futures contract of different contract months) on the same underlying continue as normal? Please give reasons for your view.

Q16: If a VCM is triggered for a given instrument, should trading of derivatives (e.g. single stock options or warrants) of that instrument continue as normal? Please give reasons for your view.

Q17: Do you have any other comments on the VCM proposal?

CHAPTER 4: POSSIBLE MARKET CONCERNS ON THE PROPOSED MODEL AND HKEX RESPONSE

76. In this chapter, possible concerns or perceptions on the proposed VCM are raised and discussed.

77. **Perception: HKEx wants to introduce VCM in order to align Hong Kong with the Mainland exchanges.**

Aligning with the Mainland is not the objective; instead, the main driver is regulatory guidance from IOSCO and international best practice. The objective of the VCM is to protect market integrity against disorderly trading caused by extreme price volatility, and the preferred model should be one that is best suited to the Hong Kong market's specific needs.

78. **Perception: There is no urgent need to introduce VCM in Hong Kong as it is a relatively safe market.**

Although the Hong Kong market has not had any major trading incident of a 'Flash Crash' nature up to now, the risk of future mishaps cannot be ruled out. If and when any major trading incident does occur, it would affect market integrity and investor confidence. Given the example of overseas exchanges and international regulatory guidance on this issue, it seems preferable to take steps to mitigate the risk of a major trading incident.

79. **Perception: A VCM would result in frequent trading suspensions and be disruptive to normal trading, especially where there is a change in fundamentals.**

In order to prevent disorderly trading, some level of trading interruption would be inevitable. However, special care has been taken in the VCM design to minimise market interruption. For example, a dynamic reference price is proposed to capture the speed and magnitude of price changes. The proposed reference price and triggering level are set such that the VCM model would not be overly sensitive and intrusive in normal trading conditions. Moreover, the VCM would not be applicable in the last 15 minutes of CTS to allow for efficient price discovery, and a maximum of 2 triggers per trading session is applied for each VCM instrument.

80. **Issue: It would be difficult for Market Makers or liquidity providers to make markets when the underlying is interrupted by a VCM.**

HKEx recognises that it may be difficult for the Market Makers or liquidity providers to hedge, which would impact their market making capability during the cooling-off period. In view of this, they may request to waive or relax their market making obligations, in accordance with the existing policies and procedures as appropriate.

81. **Perception: The VCM model is complex and would require significant system changes.**

HKEx recognises these concerns and has therefore proposed a relatively light-touch and simple VCM model for consultation. There would also be sufficient lead time if the VCM is to be implemented. For the securities market, the implementation of the VCM, if adopted, would be coordinated with other market initiatives such as the proposed new CAS model and possibly Trading Halts in order to minimise market participants' development and testing efforts. For the derivatives market, implementation should not be overly complex as the existing system already has some kind of price limit mechanism in place. HKEx would nonetheless provide market education to ensure that the model is well understood by the market participants.

PART B

CLOSING AUCTION SESSION (CAS)

CHAPTER 5: BACKGROUND AND REASONS FOR CAS

82. Chapters 5 to 9 of this Consultation Paper set out the rationale for and the details of HKEx's proposal to introduce a CAS. As explained in the following paragraphs, HKEx introduced a CAS in May 2008, but it was suspended nine months after its introduction. A new and improved CAS model is now put forward for market consultation.

Rationale for a closing auction session

83. There are generally two major types of trading mechanisms in the securities market, namely continuous trading (sometimes known as continuous auction) and single-price auction (sometimes known as call auction). Please refer to Appendix III: Two common types of trading mechanisms in the securities markets for more details.
84. Internationally, it is common for securities exchanges to adopt continuous trading in their main trading session (continuous trading session, CTS). In the CTS, bid and ask orders are submitted to the market and executed in price and time priority against matching orders within a central limit order book. Through the matching process, price discovery and order execution are continuous.
85. However, the continuous trading method is generally considered less well adapted to trading at the start of the day, where there is a peak of activity as market participants react to overnight information; and at the market close, where there is again a peak of activity as market participants endeavour to complete their executions for the day. Accordingly, a single-price auction mechanism is commonly adopted at the market opening and closing. The mechanism usually consists of an order input phase to gather buy and sell interests to trade at a single price; and a price determination and trade execution phase, in which the single price is determined by a pre-defined auction algorithm to maximise matching and orders are matched at this price in accordance with their order priority.
86. By consolidating the trading interest of multiple buyers and sellers, a single-price auction generates a consensus price which reflects the interaction between market supply and demand. It also means that it would be difficult and expensive for any party to influence the outcome of an auction. Furthermore, the mechanism also enables trades to be executed at the opening and closing prices, which is an important objective for many market participants.
87. In recognition of these benefits, on 25 March 2002, HKEx introduced a 30-minute Pre-opening Session (POS) for the securities market, operating on the basis of a single-price auction mechanism.
88. As described in Chapter 6, HKEx introduced a CAS in 2008, but it was suspended in 2009. In consequence, the closing mechanism remains in its original form with the CTS continuing until the market close. The closing price itself is calculated based on the median of 5 snapshots taken at 15-second intervals during the last minute of trading (see Appendix IV). This mechanism provides some protection against gaming of the closing price. However, it is difficult or almost impossible for market participants to

execute orders exactly at the closing price. HKEx has received feedback from the market that it should consider introducing a CAS at the market close, a practice adopted by almost all major securities exchanges in the world.

CHAPTER 6: HKEX'S EXPERIENCE OF THE PREVIOUS CAS

89. In 2007, HKEx consulted the market on the proposed introduction of a CAS to facilitate price discovery and trading at the securities market close. The Consultation Paper and Consultation Conclusions are available respectively at http://www.hkex.com.hk/eng/newsconsul/mktconsul/documents/c_auction_e.pdf and <http://www.hkex.com.hk/eng/newsconsul/mktconsul/documents/cac.pdf>
90. Strong market support was expressed in the responses to the consultation, and on 26 May 2008, HKEx introduced a CAS (the previous CAS, see Appendix V). Based on market feedback during the consultation, the design of the previous CAS was based on the auction mechanism applied in the POS. This design was adopted to minimise the cost and effort of implementing the CAS, given market's familiarity with the POS mechanism.
91. When the CAS was in operation, it was widely used by the market. Over 80% of Exchange Participants (EPs) participated in the previous CAS, and on average it contributed about 5% of equity turnover, and sometimes it was over 20% on index rebalancing.
92. The previous CAS is also considered to have improved price discovery while in operation⁷.
93. Nonetheless, it was observed that while securities on the whole traded with lower price volatility during the CAS, individual securities in some instances experienced large price swings, particularly when there were index rebalancing for these securities.
94. In light of these cases of large price movement, HKEx consulted the market again in November 2008 on the proposed introduction of a price control mechanism in the CAS to address the risks associated with the large price movement. The option of suspending the CAS was also put forward for consideration. Based on market feedback, HKEx concluded in February 2009 that a 2% price limit during the CAS would be implemented in June 2009. The Consultation Paper and Consultation Conclusions are available respectively at http://www.hkex.com.hk/eng/newsconsul/mktconsul/documents/cp200811_e.pdf and <http://www.hkex.com.hk/eng/newsconsul/mktconsul/documents/closing.pdf>
95. However, before the price control limit could be implemented, there was a further incident of large price movement in the CAS. On 9 March 2009 the share price of HSBC (Stock Code: 5) experienced a significant drop (about 11%) within a few seconds before the end of the CAS.

⁷ Academic analysis finds that price discovery improved after the introduction of the CAS and deteriorated after its suspension, i.e. the suspension of the CAS led to a decrease in market quality. See for example, 'The Impact of Closing Call Auction on Liquidity and Price Discovery Process: An Analysis on the Stock Exchange of Hong Kong', Aitken, Lepone & Chan.

96. Owing to the event, HKEx decided to suspend the CAS with effect on 23 March 2009 to restore investor confidence. The planned price control mechanism mentioned in paragraph 94 above was not implemented, and the old closing mechanism was reinstated.
97. The trader, whose large-sized ask orders caused the significant HSBC stock price plunge, was prosecuted by the SFC for breaching the obligations under the Code of Conduct. However, the Securities and Futures Appeals Tribunal (SFAT) allowed application for review of the case, and in the end the trader was not reprimanded or penalised⁸. In its judgement, the SFAT commented on the “inherent instability” of the previous CAS. The previous CAS was susceptible to price volatility caused by significant order imbalance along with an exceedingly aggressive limit order hidden in the order book which the market cannot see.
98. From these events it is clear that any new CAS model proposed for the market must have a significantly improved design compared with the previous CAS. And in particular, the “inherent instability” issue of the previous CAS must be addressed.

Continued demand for a CAS

99. Since the suspension of the previous CAS, many market participants have repeatedly asked for the introduction of a CAS in some form because of their need to execute at the closing price. As mentioned above, index tracking funds need to rebalance their holdings at the closing price in order to track their underlying index as closely as possible. They also need to use closing prices for fund valuation.
100. It is estimated that about 10% of the daily equity flow on normal trading days and more than 30% on major index rebalancing days comes from MOC orders, which are mandated to be executed at the closing price. The total amount of rebalancing and MOC fund flow is estimated to be over HK\$1.2 trillion in 2013, and the amount is expected to grow further in line with the development of passive/index tracking funds.
101. The current closing mechanism, where the closing price is determined by taking the median of 5 snapshot prices, does not support execution of MOC orders. Accordingly, participants have to execute MOC orders as best as they can. As the slippage (or tracking error) for rebalancing and MOC orders range from few to over ten basis points, which means that the industry is estimated to be losing hundreds of millions or over a billion per annum on closing price slippage. This cost is borne by index tracking funds and ultimately by their investors which include pension funds and general retail investors.
102. International practice also indicates that the introduction of a CAS is favourable to execution at the close. As shown in Figure 3 below, all developed markets except Hong Kong and most emerging markets⁹ use a CAS.

⁸ See: <http://www.sfc.hk/edistributionWeb/gateway/EN/news-and-announcements/news/doc?refNo=13PR51>

⁹ Based on MSCI country classification.

All Developed Markets Except HK have CAS	Most Emerging Markets have CAS
<p>With CAS (22):</p> <ul style="list-style-type: none"> ✓ Australia ✓ Austria ✓ Belgium ✓ Canada ✓ Denmark ✓ Finland ✓ France ✓ Germany ✓ Ireland ✓ Israel ✓ Italy ✓ Japan ✓ Netherlands ✓ New Zealand ✓ Norway ✓ Portugal ✓ Singapore ✓ Spain ✓ Sweden ✓ Switzerland ✓ UK ✓ US 	<p>With CAS (20):</p> <ul style="list-style-type: none"> ✓ Brazil ✓ Colombia ✓ Czech Republic ✓ Greece ✓ Hungary ✓ Indonesia ✓ Korea ✓ Mainland (SZSE) ✓ Malaysia ✓ Mexico ✓ Peru ✓ Philippines ✓ Poland ✓ Qatar ✓ Russia ✓ South Africa ✓ Taiwan ✓ Thailand ✓ Turkey ✓ UAE
<p>Without CAS (1):</p> <ul style="list-style-type: none"> × Hong Kong 	<p>Without CAS (4):</p> <ul style="list-style-type: none"> × Chile × Mainland (SSE) × Egypt × India

Figure 3: All developed markets except Hong Kong and most emerging markets have a CAS

103. In view of the market demand for a CAS and its near-universal adoption in international markets, HKEx is proposing to introduce a new CAS in the Hong Kong securities market. The details of the new model are presented in Chapter 7.

CHAPTER 7: PROPOSED CAS MODEL

104. Learning from the previous CAS experience, the new CAS model must have sufficient and effective measures to address the inherent instability of the previous CAS, especially near the end of the CAS.
105. Review of international practice (see Appendix VI for summary) indicates that exchanges typically adopt different measures to address potential price instability. These measures have been reviewed and incorporated in the proposed model as appropriate.
106. Based on research into international practice and preliminary discussions with industry practitioners, a new closing auction mechanism is now proposed. The new CAS model retains the basic concept of a CAS, namely as a single-price auction session to enable not only formation of the closing price but also execution at that price.

Applicable securities for the CAS

107. A phased approach is proposed for the CAS rollout. In the first phase, only securities which require execution at market close or are involved in index rebalancing would have a CAS.
108. Accordingly, the CAS Securities in Phase 1 would comprise (a) the major index constituent stocks (b) the Exchange Traded Funds (ETFs) with Hong Kong stocks as underlyings.
109. For the sake of simplicity, the Hang Seng Composite LargeCap Index and Hang Seng Composite MidCap Index constituent stocks as well as other Stock Connect Securities would be regarded as major index constituent stocks¹⁰. It is believed that the aforementioned CAS Securities would include most of the stocks requiring execution at market close and index rebalancing.
110. Based on this approach, there would be around 320 securities in the list of CAS Securities in Phase 1. The list would cover about 80% of the equity turnover and market capitalisation in the Hong Kong securities market¹¹.
111. Subject to market feedback, the list of CAS Securities for Phase 2¹² would be further expanded to all equity securities and funds; however, the list would still exclude structured products, equity warrants and debt securities and any other securities HKEx considers inappropriate to include. The security coverage of the list on such further expansion would then cover 100% of the equity market by both market capitalisation and turnover.

¹⁰ The two selected indexes would include almost all Hong Kong-listed constituent stocks in the Hang Seng Index series, the FTSE Index Series and the MSCI Index Series by market capitalisation and turnover.

¹¹ Based on trading statistics as of September 2014.

¹² These securities include equity securities, depositary receipts, unit trusts/mutual funds, rights and preference shares and stapled securities.

112. All securities without a CAS would continue to close at the existing market closing time of 16:00 using the existing closing mechanism.

Model design features

113. The new CAS design retains most features of the previous CAS model, but it also adds specific measures to address the potential instability and to improve price formation and execution efficiency. These new features are set out as follows:

- A price limit is imposed on at-auction limit order entry during the CAS, initially at $\pm 5\%$ from a reference price and later at the best bid and best ask;
- Order amendment and cancellation in the last few minutes before the end of the CAS is disallowed;
- At-auction limit orders are allowed throughout the CAS;
- The CAS closes at a random time;
- Short selling with tick rule is allowed during the CAS; and
- The reference price is used for trade execution in the absence of a final Indicative Equilibrium Price (IEP)¹³ to maximise matching opportunity.

114. The proposed new CAS model is shown in Figure 4 and set out in paragraphs 115 to 122 below.

Time	9:30-12:00: 13:00- 16:00	16:00	16:01	16:08	16:10	16:12
Session	Continuous Trading Session (CTS)	Closing Auction Session				
		Blocking Period (1 min)	Order Input Period (7 mins)	No-Cancellation Period (2 mins)	Random Closing Period (2 mins)	
Description	Ref price based on the median of 5-snapshot nominal prices in the last minute of CTS	<ul style="list-style-type: none"> • Calculate & publish ref price • No Input, Cancel & Amend • Reject carried-over orders outside price limit 	Price Limit:	Within lowest ask & highest bid		
			5% of Ref Price			
			Order Type Allowed:	At-auction Order		
			At-auction Limit Order	At-auction Limit Order		
			Order Input, Cancellation & Amendment:			
			Allowed Input, Cancel & Amend	Input Allowed, Cancel & Amend Not Allowed		
Other New Measures:						
1. Better market transparency by showing the IEP price limit, the 16:00 CTS closing and imbalance information (direction and quantity)						
2. Allow short selling orders subject to a tick rule (reference price)						
3. Allow matching of at-auction orders at the reference price when an auction price cannot be determined						

Figure 4: Proposed design of new CAS

¹³ The IEP is the indicative auction price for matching at any time during the auction process as if the auction is concluded then. It is generally the price within the highest bid and the lowest ask and at which the aggregate volume of matchable orders is maximised.

115. **Blocking Period (16:00 – 16:01)**

- Immediately after the CTS ends at 16:00, there would be a 1-minute Blocking Period whereby a reference price for each CAS security is determined and published.
- The reference price would be determined using the existing closing price calculation method, i.e. the median of the 5 snapshot nominal prices taken from 15:59 at 15-second intervals (see Appendix IV). This reference price would then be used to determine the price limit of input prices for at-auction limit orders during the Order Input Period (see the next paragraph). Both the reference price and the price limit would be disseminated to the market.
- After determination of the reference price, outstanding orders from the CTS would be carried forward as at-auction limit orders to the CAS. Aggressive orders with prices outside the permissible $\pm 5\%$ price limit (i.e. bid orders with price above the upper limit and ask orders with price below the lower limit) would be cancelled during the Blocking Period.

116. **Order Input Period (16:01 – 16:08)**

- There would be a 7-minute Order Input Period starting from 16:01. EPs would be allowed to enter at-auction orders and at-auction limit orders into the system within a proposed price limit of $\pm 5\%$ from the reference price. The price limit would be applied to all CAS Securities.
- Orders entered during this period may be cancelled or amended.

117. **No-Cancellation Period (16:08 – 16:10)**

- During the 2-minute No-Cancellation Period starting from 16:08, EPs would still be able to enter both at-auction orders and at-auction limit orders.
- However, the input prices of all at-auction limit orders during this period would have to be within the lowest ask and highest bid prices in the order book¹⁴. All orders with prices outside this price limit would be rejected. This price limit should generally be at or narrower than the $\pm 5\%$ price limit imposed in the Order Input Period. The new price limit for the at-auction limit orders during this period would also be disseminated to the market via market data feed.
- Orders would not be able to be cancelled or amended.

¹⁴ In the case that the best ask > best bid (i.e. an IEP would not be formed), only at-auction limit orders at the reference price can be input into the order book.

118. **Random Closing Period (16:10 – random point up to 16:12)**

- A 2-minute Random Closing Period starting from 16:10 would be introduced. During this period, order input and other associated rules would follow those of the No-Cancellation Period. However, the CAS would end randomly within this 2-minute period for all CAS Securities, with order matching starting immediately afterwards. Securities market trading would close for the day, and the closing prices of all CAS Securities would then be disseminated.
- The trading timetables of HKEx's securities and derivatives markets after the introduction of the new CAS model are shown in Appendix VII. As with the previous CAS, the trading of Hang Seng Index, Hang Seng China Enterprise Index related futures and options, Dividend Futures, HSI Volatility Index Futures and CES China 120 Index Futures in the derivatives market would be extended for 15 minutes to end at 16:30, while other products would remain unchanged. Accordingly, subject to consultation feedback, the opening time of the After Hours Futures Trading may be postponed for 15 minutes as well.

Short selling orders with a tick rule

119. It is proposed that short selling orders with a price not lower than the reference price be allowed in the CAS. The order priority and features of the short selling orders would be identical to all other at-auction limit ask orders, except that these orders would have to be tagged as "short sales" and would be further subject to the tick rule on the reference price.

Using the reference price for trade execution in the absence of a final IEP to maximise matching opportunity

120. In the previous CAS, IEP would not be available due to the absence of at-auction limit orders on one or both sides of the order book, or to non-overlapping of the prices of the lowest ask and highest bid. The closing price for such cases would then be the reference price, but no auction matching for the orders (including the at-auction orders) would take place.
121. To maximise matching opportunity in the CAS, it is proposed that the matching algorithm be enhanced such that for securities without a final IEP, at-auction orders and at-auction limit orders at or better than the reference price would be matched at the closing price, which is the reference price in such case.

Market data dissemination

122. In the new CAS model, market data disseminated during the auction would be the existing market data available for POS (including IEP, Indicative Equilibrium Volume or IEV and 10 price queues), as well as some new market data required to facilitate price discovery and trading. The new market data would include the reference price, the upper price limit, the lower price limit, the trading state, the imbalance information at the IEP (direction and imbalance volume) and a flag indicating whether the security is a CAS Security. The 16:00 price (i.e. the median of the 5-snapshot nominal prices at the end of the CTS) would also be published for all CAS and non-CAS Securities.

CHAPTER 8: DISCUSSION AND CONSULTATION QUESTIONS ON THE NEW CAS MODEL

123. In this chapter, the rationale for the proposed model features is discussed and the key questions for consultation are provided for response.

Objectives of the CAS

124. The new CAS model aims to meet market demand for execution at the closing price and to improve the closing price formation mechanism, while addressing the issue of inherent instability in the previous CAS.

Consultation Questions

Q18: Do you support the introduction of the new CAS model in the Hong Kong securities market? Please give reasons for your view.

Applicable security types for the CAS and the rollout approach

125. In order to minimise market impact and to ensure a smooth rollout, the new CAS model is proposed to be implemented only on securities which require a CAS.

126. It is proposed that structured products, equity warrants and debt securities be specifically excluded from the implementation of the new CAS model, since they do not have MOC execution needs. It can be argued that these products should not be excluded from the CAS as they are included in the POS. However, the objective of the POS is more on price discovery rather than trade execution, so the treatment need not be identical. Deutsche Börse (DB) and London Stock Exchange (LSE), for example, also exclude warrants from closing auction, although these products nonetheless participate in the opening auction.

127. It is further proposed to include only the major index constituent stocks (deemed to be the constituent stocks of the Hang Seng Composite LargeCap Index and Hang Seng Composite MidCap Index and other Stock Connect Securities) as well as those ETFs with Hong Kong stocks as underlyings.

128. When the market is familiar and comfortable with the new mechanism, the security coverage may be further expanded to all other equity securities and funds, but still excluding structured products, equity warrants and debt securities.

Consultation Questions

Q19: Do you agree that the new CAS model should only be applied to the major index constituent stocks (i.e. Hang Seng Composite LargeCap Index and Hang Seng Composite MidCap Index constituents as well as other Stock Connect Securities for Southbound trading)? Please give reasons for your view.

Q20: Do you agree that the new CAS model should be applied to ETF? If yes, which

type of ETF should be applied? Please give reasons for your view.

(i) Apply to all ETFs

(ii) Only apply to ETFs with Hong Kong stocks as underlying

Please give reasons for your view.

Q21: Do you agree that at a later stage the new CAS model should be expanded to other equity securities and funds as proposed? If so, when should the CAS be rolled out to these securities and funds? Please give reasons for your view.

Q22: Do you agree that the new CAS model should exclude structured products, equity warrants and debt securities? Please give reasons for your view.

Price limit imposed on at-auction limit orders during the CAS

129. The proposed CAS model would impose a price limit on the limit orders carried over to the CAS from the CTS, as well as the new at-auction limit orders input during the CAS. The price limit is $\pm 5\%$ from the reference price during the Order Input Period, and the best bid and best ask for the subsequent periods. The objective of the price limit is to prevent excessive price movement in the CAS.

Price limit of $\pm 5\%$ from reference price during Order Input Period

130. For the previous CAS, HKEx consulted the market on the introduction of a price control mechanism to curb extreme price volatility. At the time, the market preferred a 5% price limit as it would offer protection against adequate price volatility while not confining liquidity in the CAS. However, since the previous CAS incorporated no other price volatility control measures, a more restrictive 2% price limit was concluded – albeit that the previous CAS was suspended and the price limit was never implemented.

131. In contrast with the previous CAS, the new CAS model incorporates other price control measures such as two staged price limit, allowing at-auction limit orders throughout the CAS, introducing random closing and better auction transparency. Accordingly, the price limit in the new CAS model does not need to be too restrictive.

132. HKEx is of the view that a 5% price limit would be suitable as it can prevent excessive price movement during heightened volatility without being overly restrictive on index rebalancing days. Based on past statistics¹⁵, a price limit of 5% can accommodate over 99% of the price volatility during the last 10 minutes on normal trading days and over 95% on index rebalancing days.

¹⁵ The analysis is based on trading statistics from April to June 2014.

133. As for whether the price limit mechanism, if implemented, should be applied across the board to CAS Securities of all price range, it could be argued that:
- Higher-priced stocks should have a lower percentage price limit, and lower-priced stocks should have a higher percentage price limit; and/or,
 - Different percentage price limits should be imposed depending on the product type and liquidity.
134. However, it is considered that using different percentage limits for different securities would introduce model complexity and lead to market confusion.
135. The price limit is therefore proposed to be 5% during the Order Input Period for all CAS Securities, i.e. the preferred percentage based on the market responses to the previous consultation, rather than the 2% price limit concluded at the time.

Price limit at lowest ask and highest bid prices during No-Cancellation and Random Closing Period

136. In order to prevent unexpected price volatility due to aggressive at-auction limit orders input near the end of the CAS, it is further proposed that the permissible price range of these orders be kept between the prices of the lowest ask and the highest bid in the No-Cancellation and Random Closing Periods. This approach would allow efficient price discovery through at-auction limit orders while maintaining the maximum possible range of executable prices in the Order Input Period.

Consultation Questions

Q23: Do you support introducing a price limit during the CAS? Please give reasons for your view.

Q24: Do you support a price limit of 5% during the Order Input Period for all CAS Securities? Please give reasons for your view.

Q25: Do you agree that a further price limit within the best bid and best ask should be applied during the No-Cancellation Period and Random Closing Period? Please give reasons for your view.

Allowing the input of at-auction limit orders throughout the CAS

137. In the previous CAS, only at-auction orders (not at-auction limit orders) were allowed to be input after the Order Input Period. The rationale was to prevent the entry of very aggressive at-auction limit orders at or near the end of the CAS that might widen the possible executable price range and led to undesired price volatility. However, this means that investors may only input at-auction orders near the end of the CAS, which may have an adverse impact in liquidity.
138. In the new CAS model, it is proposed that a further price limit restriction within the lowest ask and highest bid prices in the order book be imposed on at-auction limit

orders. Accordingly, EPs would be allowed to input at-auction limit orders throughout the CAS for better price discovery, and those at-auction limit orders entered after the Order Input Period would not be able to affect the IEP range¹⁶.

Consultation Questions

Q26: Do you agree that at-auction limit orders should be allowed throughout the CAS? Please give reasons for your view.

Short selling with tick rule allowed

139. It is proposed that short selling orders with a price not lower than the reference price be allowed in the CAS for better price discovery.
140. In overseas markets, short selling is generally allowed in the CAS if it is permissible in the CTS. Some market participants have suggested that short selling orders could help reduce price volatility by offsetting order imbalances when there is a surplus on the buy side.

Consultation Questions

Q27: Do you think short selling orders with a tick rule should be allowed during the CAS? Please give reasons for your view.

Q28: If short selling order is to be allowed, should it be at or higher than the reference price? Please give reasons for your view.

No order amendment and cancellation towards the end of the CAS

141. In the previous CAS, there was a 2-minute Pre-order Matching Period during which order amendments and cancellations were not allowed. The rationale for introducing such a period was to prevent drastic changes to the order book towards the end of the CAS caused by last-minute order amendments or withdrawals. This feature also encourages EPs to input orders before the Pre-order Matching Period.
142. The same feature would also be adopted in the new CAS model. Order amendments and cancellations would not be allowed after the Order Input Period so as to deter gaming behaviour at or near the end of the CAS.

Consultation Questions

Q29: Do you agree that order amendment and cancellation should be disallowed during

¹⁶ It should be noted that although the IEP range would not fluctuate further from the lowest ask to the highest bid, the final IEP may still change due to further changes to the order book.

the No-Cancellation Period and Random Closing Period? Please give reasons for your view.

Random closing to end the CAS

143. In the previous CAS consultation, some market participants proposed that the CAS should be closed at a random time (random end or random closing) instead of at a fixed time in order to deter gaming. This feature has been adopted by overseas exchanges such as LSE, DB and Australian Securities Exchange (ASX).
144. Under this approach, the auction matching would start randomly within a 2-minute period starting from 16:10 to 16:12, with the exact ending of the CAS determined randomly by the system. This feature could prevent gaming based on the market closing time and encourage earlier input of orders.
145. Some market participants have raised concerns that random closing may cause market confusion as to the exact closing time and increase implementation complexity. However, the experience of the previous CAS highlights the disadvantage of having a fixed closing time. Accordingly, HKEx is of the view that implementing a random closing time together with a price limit is essential to deter gaming behaviour. Potential concerns on model complexity should instead be addressed by market education.

Consultation Questions

- Q30: Do you agree that random closing be adopted in the CAS to prevent gaming? Please give reasons for your view.
- Q31: If random closing is to be adopted, should it be over a period of up to 2 minutes or would you prefer a different duration? Please give reasons for your view.

Allowing matching for securities without final IEP at reference price

146. In the previous CAS, if at-auction limit orders were absent on either side of the order book or if the highest bid price was lower than the lowest ask price, there would be no IEP and hence no auction matching, even if there were at-auction orders on one or both sides. The closing price would then be determined by the median of the 5 snapshot prices of the last minute of the CTS.
147. For overseas securities exchanges which accept both at-auction orders and at-auction limit orders during their auction sessions, it is noted that all of them have a mechanism in place to maximise matching when the highest bid and the lowest ask prices do not overlap. Typically, a reference price, such as the last traded price, is used for order execution.
148. Therefore, it is proposed that an additional matching rule be incorporated to maximise the matching opportunity for both at-auction orders and at-auction limit orders with prices at or better than the reference price. In cases where no final IEP is established

during the CAS, the reference price would become the closing price. This price would also be used for order matching based on matching priority, i.e. by order type, price, and then time.

Consultation Questions

Q32: In the absence of a final IEP, do you agree that the reference price should be used as the closing price and for trade matching? Please give reasons for your view.

Duration of the CAS

149. During our preliminary discussions with market participants, there was feedback that the duration of the CAS may be shortened, e.g. reducing the duration of the Order Input Period from the proposed 7 minutes to 5 minutes such that the market may close at 16:10.

Consultation Questions

Q33: What would be the preferred duration of the CAS?

- (i) Same as the proposed model, i.e. 7-minute Order Input Period to end the CAS at 16:12; or
- (ii) 5-minute Order Input Period to end the CAS at 16:10; or
- (iii) Others, please specify

Please give reasons for your view.

Impact on POS and Trading Halts

150. Some market participants suggested that a few of the features proposed may also be beneficial for the existing POS and the proposed Trading Halts initiative¹⁷.

151. However, to simplify implementation and to allow the market to adapt to the proposed changes, it is suggested that the potential enhancements to the existing POS and the planned Trading Halts are not to be considered for the time being. The new features, where appropriate, would only be implemented in the POS and the planned Trading Halts regime at a later stage after a review with the market, such as when HKEx's

¹⁷ The Consultation Paper and Consultation Conclusions on Trading Halts are available respectively at <http://www.hkex.com.hk/eng/newsconsul/mktconsul/Documents/cp201207.pdf> and <http://www.hkex.com.hk/eng/newsconsul/mktconsul/Documents/cp201207cc.pdf>.

As mentioned in the Consultation Conclusions, the mid-session of Trading Halts would follow the auction mechanism applied in the POS.

planned next-generation trading system, the Orion Trading Platform-Cash (OTP-C), is introduced (subject to market readiness).

Consultation Questions

Q34: Do you agree that some features of the new CAS model may also be beneficial for the POS and/or the Trading Halts? If so, which feature(s)? Please give reasons for your view.

Q35: Do you agree that any enhancements for POS and/or the Trading Halts should be implemented later rather than during the introduction of the new CAS? Please give reasons for your view.

Impact of the Extended Market Closing Time

Cash Market

152. With the new CAS, the market closing time would be extended to 16:12, 12 minutes later than today and 2 minutes later than the previous CAS. As such, EPs would have less time to do their day end processing including margin calls.

Derivatives market

153. The Afternoon Session of Stock Index Futures, Stock Index Options, Dividend Futures, HSI Volatility Index Futures and CES China 120 Index Futures in the derivatives market currently close at 16:15, which is 15 minutes after the market close of the securities market. With the introduction of a CAS, the new market closing time is proposed to be 16:30 in order to maintain the same time window for investors to rebalance their positions, if necessary.

154. In addition, there is currently a 45-minute break before the start of After-Hours Futures Trading (AHFT) at 17:00 in the derivatives market. According to the feedback from market participant, the time window is important for trading data reconciliation and necessary for normal operations and contingency scenarios. Reducing the break is not preferred as there may be some unexpected manual work to be handled after market close before AHFT starts. As such, HKEx is of the view that the starting time of AHFT should be changed from 17:00 to 17:15.

Consultation Questions

Q36: Do you foresee any issues with your day end processing such as margin calls in the cash market due to the extended trading time for 12 minutes? If yes, how may the issue be resolved? Please give reasons for your view.

Q37: To maintain the 45 minutes break before the start of AHFT, do you agree that the start time of AHFT to be changed from 17:00 to 17:15? If not, what time do you prefer? Please give reasons for your view.

CHAPTER 9: POSSIBLE MARKET CONCERNS ON THE NEW MODEL AND HKEX RESPONSE

155. In this chapter, possible market concerns or perceptions on the new CAS model are raised and responses are set out below.

156. **Perception: The current closing price calculation method (i.e. the median of the 5 snapshot prices) has worked well and does not need to be changed.**

Under the current closing mechanism, only 5 snapshot prices in the last minute of CTS are used to determine the closing price, so the closing price does not take into consideration the volume of the trades as well as market supply and demand. As a result, EPs tend to input their MOC orders from clients towards the very end of the CTS which increases price volatility during the last moments of the CTS, in particular on index rebalancing days. In addition, as discussed in paragraph 101, such execution efforts would not be able to match the closing price exactly, resulting in tracking errors that amount to more than a billion per year.

The new CAS model would facilitate the execution of MOC orders at the closing price and address the issue of price volatility near the market close.

157. **Perception: The new CAS model would favour institutional investors and EPs, since smaller EPs and retail investors would rarely use the CAS.**

Unlike retail investors who are usually most active at the market open, some institutional investors trade towards market close as they need to execute MOC orders. However, this does not mean that retail investors would not benefit from the new CAS. With a CAS, retail investors would have an additional chance to execute their orders with increased institutional participation, and their unexecuted orders in the CTS would be automatically carried forward to CAS as at-auction limit orders, which may then be executed at a price better than their specified price. In fact, the experience of the previous CAS was that over 80% of EPs (including a majority of retail EPs) participated in it. Additionally, many retail investors who are end investors of index tracking funds would also benefit from the lower tracking errors resulting from the CAS.

158. **Perception: The new CAS model would easily be subject to market manipulation.**

The new CAS model has new features to address potential market manipulation. For instance, the model would impose a 5% price limit on at-auction limit orders, allow at-auction limit orders throughout the CAS, provide better market transparency and introduce random closing. Moreover, HKEx will assist the SFC in closely monitoring the trading activities, conducting thorough reviews and taking enforcement actions as necessary should any trading irregularities be detected.

159. **Perception: Retail investors are disadvantaged in their participation of CAS.**

For retail investors in the CAS, the experience of the previous CAS was that they generally prefer to input limit order types with a specified price. Accordingly, retail

orders were all executed during the CAS at prices either at or better than the limit prices they input. In other words, the previous CAS provided retail investors with an additional window to execute their orders and the potential for price improvement. Furthermore, the new CAS would also allow investors to input at-auction limit orders throughout the CAS. This feature would benefit investors (especially retail investors), who prefer to have price protection.

160. Perception: Prices in the new CAS model would be volatile.

Based on international experience, a CAS can reduce market volatility as a whole, and this phenomenon is also observed in the previous CAS. For individual securities, the new CAS model has features to reduce price volatility when there are large order imbalances. These features should address the price instability issue seen in specific cases observed in the previous CAS.

161. Perception: The end of the CTS would become volatile as liquidity in this period would move to the CAS.

It is believed that even with a CAS, retail and institutional investors would continue to trade actively at the end of the CTS so liquidity would not be thin during this period. A key reason is that EPs who want to enjoy higher order priority would input orders before the CAS, since any unfilled orders would be carried over to the CAS and would then enjoy higher time priority than the new at-auction limit orders. This is supported by statistics from the previous CAS, with the peak of trading activity in the whole CTS taking place in the last few minutes of the session and liquidity moved from the CTS was not significant.

162. Perception: The new CAS model would lead to potential gaming of the reference price.

Following the experience of the previous CAS, HKEx has paid particular attention to the need to prevent potential gaming in the new CAS model design. The reference price determination in the new CAS model in fact adopts the current closing price calculation mechanism, i.e. using the median of the 5 snapshot prices as the reference price. The price determination has some degree of randomness, and the liquidity around the end of CTS is generally high (see the previous paragraph), which combined to make gaming difficult. In addition, HKEx would closely monitor trading activities and refer to the SFC should any case of suspected gaming be detected.

163. Perception: The price limit would be too wide or too narrow.

A uniform price limit of 5% is proposed which should be appropriate for the proposed CAS Securities. HKEx is of the view that a narrow price limit may hinder price discovery and trade execution, while a wide limit may allow excessive price volatility. Based on past statistics on the proposed applicable securities, a 5% price limit would be able to cover over 99% of the price volatility during the last 10 minutes of trading on normal days and more than 95% on the index rebalancing days. The 5% limit is not too wide either, as even today, some stocks may move more than 5% in the last few minutes of trading.

164. Issue: The new CAS model may be difficult to understand.

It is acknowledged that brokers and investors would need to learn and adjust to some new features of the proposed CAS model. However, HKEx would provide market education such as broker and investor seminars before and after the launch. Moreover, additional market data and reports would be provided to facilitate market's understanding of the model.

165. Issue: Some features proposed in the new CAS model should be incorporated in the existing POS and the proposed mid-session auction of Trading Halts initiative.

It is acknowledged that some features proposed in the new CAS model may also be beneficial for the existing POS and the proposed mid-session auction of Trading Halts initiative. However, to simplify implementation, the potential enhancements to the POS and the planned Trading Halts are not to be considered for the time being. The new features, where appropriate, would only be implemented at a later stage after a review with the market.

166. Issue: Since structured products would be excluded from the CAS but their underlying may continue to trade, there could be price misalignment, and holders of such structured products may not be able to adjust their positions in the CAS.

It is noted that there will be different closing times for structured products and their underlyings, so some may argue that structured products should be included in the CAS. However, as these products have no MOC execution needs, a CAS would not be needed; in other markets such as the LSE, DB and SIX Swiss Exchange they are excluded from the CAS as well.

This issue may be addressed through market education and better market transparency; HKEx will offer education seminars and provide both the 16:00 price and the official closing price of CAS Securities to facilitate investors' understanding of the mechanism. Nevertheless, investors of structured products would still need to be mindful of possible overnight risks, if they do not unwind their position at the end of the CTS; and the fact that Mandatory Call Events for CBBCs could occur in the CAS, as the price of the underlying stocks or indices may still fluctuate in the CAS.

167. Issue: Implementation of the new CAS model would require significant system changes and additional investment from the market.

It is expected that the major system changes would be made centrally by HKEx itself, with changes required at the EP system level being comparatively minor. Many EPs and their system vendors also have experience of the previous CAS, which should help reduce the effort required. Moreover, the new CAS is proposed to be implemented in conjunction with other major enhancements such as the proposed VCM model and possibly Trading Halts in order to minimise market participants' development and testing efforts, which would bring synergistic developmental and testing savings for EPs. In any case, adequate preparation time would be given to the market for system implementation.

PART C

TIMELINE AND RESPONSES TO THE CONSULTATION PAPER

CHAPTER 10: IMPLEMENTATION APPROACH AND TIMELINE

168. The consultation period for this Consultation Paper will be 12 weeks and will close on 10 April 2015. HKEx will then summarise the comments received and if applicable, set out the final models for the new VCM and the CAS in a Consultation Conclusions Paper.
169. Subject to market feedback, the proposals for the new VCM and CAS model would be implemented on the current trading platforms, i.e. AMS/3.8 in the securities market and HKATS in the derivatives market, as soon as practicable.
170. In order to minimise the development and testing efforts for the market, it is proposed that the development and testing of the VCM, CAS and potentially Trading Halts for the securities market be bundled together. However, the rollout would be done in phases to minimise market impact.
171. As stated in the Consultation Conclusions of Trading Halts, the implementation of Trading Halts would coincide with the rollout of other upcoming major market infrastructure initiatives. A possible consideration is to introduce Trading Halts as part of the Exchange's new Orion Trading Platform infrastructure.
172. For the VCM in the derivatives market, the development and rollout would be handled independently as it is implemented on a trading platform separate from the securities market.
173. The implementation details of the three initiatives (i.e. VCM, CAS and Trading Halts) would be announced when the Consultation Conclusions Paper is issued.

Consultation Questions

- Q38: Which implementation approach for the securities market would you prefer:
- (i) the development and testing of the VCM, CAS and Trading Halts functionalities are to be implemented together on the AMS/3.8 platform and be rolled out one by one; or
 - (ii) (1) the development, testing and rollout of VCM and CAS are to be implemented together on the AMS/3.8 platform, and (2) Trading Halts proposal is to be introduced as part of the Exchange's next-generation trading system, the Orion Trading Platform-Cash; or
 - (iii) Others, please specify.
- Please give reasons for your view.
- Q39: What should be the implementation priority among the three initiatives (i.e. VCM, CAS and Trading Halts) in the securities market? Please give reasons

for your view.

Q40: How long do you need to prepare for the rollout starting from the issuance of the specification for each initiative:

(i) VCM:

a). under 3 months; b). 4-6 months; c). 7-12 months; d). >12 months
Please give reasons for your reply.

(ii) CAS:

a). under 3 months; b). 4-6 months; c). 7-12 months; d). >12 months
Please give reasons for your reply.

CHAPTER 11: HOW TO RESPOND TO THE CONSULTATION PAPER

174. HKEx invites written comments on the proposals made in this paper no later than 10 April 2015.

175. Responses should be made by completing and returning the questionnaire on this subject (a softcopy of which in Word format is available at <http://www.hkex.com.hk/eng/newsconsul/mktconsul/Documents/cp201501q.doc>), by one of the following methods:

By mail or hand delivery to:

Corporate Communications Department
Hong Kong Exchanges and Clearing Limited
12th Floor, One International Finance Centre
1 Harbour View Street
Central
Hong Kong

By fax to: (852) 2524-0149

By e-mail to: response@hkex.com.hk

Please mark your response with the subject line: **Re: Consultation Paper for Introduction of Volatility Control Mechanism in the Securities and Derivatives Markets and Closing Auction Session in the Securities Market**

176. HKEx's submission enquiry number is (852) 2840-3844.

177. HKEx invites views on the proposals, supported, where appropriate, with reasons. Respondents are reminded that HKEx will publish responses on a named basis in the consultation conclusions, unless requested otherwise.

178. HKEx's policy on handling personal data is set out in Appendix VIII of this paper.

APPENDIX I: OVERSEAS MARKET PRACTICES ON VCM

1. The information presented is compiled on a best-efforts basis and is for background and reference purposes only. While every effort has been made to ensure that the information is accurate, some of the information may be outdated or incomplete because of changes in market practices over time. Readers are advised to consult the relevant exchanges for more details or further updates if necessary.
2. The VCM models of leading overseas exchanges, including those in Australia, Shanghai, Shenzhen, Singapore, Japan, US and the UK on both the securities and the derivatives markets, were reviewed, and their major features are summarised below.

Securities market

3. The majority of markets, except Hong Kong, have some form of VCM in place.
4. All exchanges have VCMs that are applicable at the instrument-level, which means that trading of an instrument would be suspended, interrupted or limited if its price moves beyond a certain range. In addition to the instrument-level VCM, the US and the Korean markets also have VCMs that are applicable at the market-level, under which the trading of the whole market would be suspended or limited if a major market index falls below a certain level.
5. On the reference price that is used to calculate the price limits for VCMs, the majority of markets, namely Singapore, Japan, Australia, US and the UK, use a dynamic reference price, meaning that the reference price is calculated according to the latest trade data (e.g. price of last trade 5 minutes ago). Only the US, Mainland and Korean markets have a static reference price in place, in which the reference price stays constant throughout the day (e.g. previous closing price).
6. On the price limits, the majority of the selected markets have a price limit below 20% of the reference price; however, the Australian, UK and the US markets have a wider price limit. In addition, of the selected markets, around half of them have a price limits that are constant regardless of the underlying instrument and price, while the other markets have different price limits according to the respective underlying instruments and reference prices.
7. As for the resumption procedures after a VCM is triggered, most exchanges impose a period in which trades can only happen within a certain price limits to restore continuous trading. Some exchanges in the Australian, UK and the US markets resume trading using an auction method.
8. The practices of the selected overseas markets in respect of VCM in the securities market are summarised in Table 1 below.

Table 1. Key features of VCMs in selected overseas securities markets					
Exchange / region	VCM level	Reference price(s)	Price limits	Cooling-off duration	Cooling-off arrangement
HKEx (proposed)	Instrument	Last trade 5 mins ago	10%	5 mins	Trading within a price limit
US	Instrument	Average trade price in last 5 mins	Index & ETF: 5% Others: 10% Stocks ≤ US\$3: 20+%	5 mins	Trading with a price limit followed by trade suspension; reopen with an auction
	Market	Previous close	Level 1: 7% Level 2: 13% Level 3: 20%	Level 1 & 2: 15 mins Level 3: Rest of day	Level 1 & 2: market suspension for 15 mins; reopen with an auction Level 3: Market closes for the rest of day
LSE	Instrument	Last trade and last auction trade	3-25% (Depend on security liquidity)	5 mins	Trade suspension; reopen with auction
Mainland	Instrument	Previous close	10%	Not applicable	Trading within a price limit
SGX	Instrument	Last trade 5 mins ago	10%	5 mins	Trading within a price limit
KRX	Instrument	Previous close	15%	Not applicable	Trading within a price limit
	Market	Previous closing index of KOSPI	10% Decrease	20 mins	Trade suspension; reopen with auction
TSE	Instrument	Last trade and previous close	1-4% from reference price & 15%-50% from Previous Close	5 mins	Trading within a price limit
ASX	Instrument	Last trade every 3-minute snap	20-50% from reference price	2 mins	Trade suspension; reopen with auction

Derivatives market

9. The majority of markets have some form of VCM in place. Most of the exchanges adopt the dynamic VCM model, but SGX and TOCOM adopt a static VCM model.
10. For exchanges with a dynamic VCM model, they usually reference to the trades done within the previous few seconds. Although these VCMs are handled separately for each instrument series, there may be a mechanism to halt trading of all contract months if the leading contract month is in a VCM state.
11. Concerning price limits, there is no observed pattern for these exchanges.

12. As for the resumption procedures after a VCM is triggered, the majority of exchanges impose trade suspension followed by an auction. However, CME (with their static VCM), ICE and SGX provide trading within a price limit.
13. A summary of overseas practices on VCM in the derivatives market is presented in Table 2 below.

Table 2. Key features of VCMs in selected overseas derivatives markets				
Exchange	Reference price	Price limits	Cooling-off duration	Cooling-off arrangement
HKEx (Proposed)	Dynamic (Last trade 5 mins ago)	5% (around 1.5 times error trade parameter of index futures)	5 mins	Trading within a price limit
CME	Static (Settlement price)	Equity index futures: 7%, 13% and 20%	10 mins	Trading within a price limit
	Dynamic (Trades in last few secs)	1-3 times error trade parameter	Few secs	Trade suspension with auction
ICE	Dynamic (Last trade price updated every 5 to 15 secs)	Depends on products e.g. Russell 100 & 2000 Index mini-20 index points	From 5 to 30 secs	Trading within a price limit
Eurex	Dynamic (All execution prices before triggering)	No information	Depends on market conditions	Trade suspension with auction
KRX	Dynamic (Previous close & theoretical price)	5-6% from previous close and 3% from theoretical price	15 mins	Trade suspension with auction
OSE/TSE	Static (Settlement price)	Depends on products e.g. local equity index futures: 8%, 12% and 16%	10 mins	Trade suspension with auction
	Dynamic (Last trade)	Depends on products e.g. local equity index futures: 0.8%	15-30 secs	Trade suspension with auction
SGX	Static (Settlement price)	Depends on products from 7% to 15%	5-15 mins	Trading within a price limit
TOCOM	Static (Settlement price)	Depends on products e.g. Gold 150 yen	5 mins	Trade suspension

APPENDIX II: DETAILED FEATURES OF THE PROPOSED VCM

1. General:

Item	Securities market	Derivatives market
Type of VCM	Securities level	Series level
Applicable trading session	<p>Include: CTS except the last 20 minutes of the session (i.e. no VCM in the last 15 minutes of CTS)</p> <p>Note: As per Chapters 5 to 9 of this Consultation Paper, a new CAS model is proposed for the securities market. The design of the VCM would remain the same with or without a CAS.</p>	<p>Include: Morning Session</p> <p>Afternoon Session except the last 20 minutes of the session</p> <p>Exclude: AHFT Session</p>
Applicable security type	<p>Equities: HSI and HSCEI constituent stocks</p>	<p>Equity index futures: HSI Futures (HSI), Mini-HSI Futures (MHI), H-shares Index Futures (HHI) and Mini H-shares Index Futures (MCH) spot month and the next calendar month contracts</p> <p>Exclude: Far month contracts, options and all other derivatives products</p>
Applicable trade type	Automatched trades only; i.e. manual trades are not subject to the VCM.	

2. Reference price determination:

Scenario	Reference price
<p>a. First reference price of the Morning Session</p> <p>b. First reference price of the Afternoon Session</p> <p>c. First reference price after trading resumption from trading suspensions or Trading Halts</p>	<p>a. IEP/ Calculated Opening Prices (COP) formed in the auction before market open, failing which the first auto-matched trade price in the Morning Session.</p> <p>b. The IEP/ COP formed in the auction before afternoon open (if applicable), or the first auto-matched trade price in the Afternoon Session.</p> <p>Note: If a VCM is triggered at 11:58 in the Morning Session, the cooling-off period would end at 12:00 noon. The Afternoon Session would start afresh.</p> <p>c. The first auction price (if applicable) or the first auto-matched price will be the reference price.</p>
<p>Before triggering of a VCM</p>	<p>Last trade 5 minutes ago</p>
<p>During cooling-off period</p>	<p>The reference price before the start of the cooling-off period which will not be updated during the entire period.</p>
<p>After cooling-off period in a trading session</p>	<p>If there is trading during the cooling-off period: Last trade 5 minutes ago.</p> <p>If there is no trading during cooling-off period: First trade price after the cooling-off period, which is not subject to any price limit; this price will hold for 5 minutes before reverting back to last trade 5 minutes ago.</p> <p>Note: If there have been two VCM triggers for the same instrument in the same trading session, VCM monitoring would no longer apply and hence there would be no reference price.</p>
<p>Last 15 minutes of the Afternoon Session</p>	<p>VCM would not be in effect during this period, meaning that VCM monitoring would stop 20 minutes before the end of CTS.</p>

3. Other features:

Item	Feature description
Price limits set by reference price	<p>Before the cooling-off period:</p> <ul style="list-style-type: none"> • ±10% for all applicable securities • ±5% for all applicable derivatives futures contracts
Order handling before and after triggering of VCM	<p>After the VCM is triggered, the triggering order and the aggressive orders (i.e. high bid or low ask) violating the price limits would be rejected. Partial execution within the price limit of the triggering order is allowed.</p> <p>During the cooling-off period(s), all aggressive orders outside the price limits are rejected upon their entry. Passive orders outside the price limits are accepted.</p>
Duration of cooling-off period	5 minutes
Required market data	<p>Before and after a VCM is triggered:</p> <ul style="list-style-type: none"> • Same as today <p>During VCM cooling-off period:</p> <ul style="list-style-type: none"> • Reference price • Upper and lower price limits • Trading state • Time of VCM expiry/resumption <p>Others:</p> <ul style="list-style-type: none"> • Indicator at instrument-level on whether VCM is applicable or not in securities market
System message dissemination	Rejection reason at the order level
Inter-connectivity between equity derivatives and their underlyings	<p>Independent:</p> <p>Linked products' (e.g. DWs, CBBCs and single stock options with the affected instrument as their underlying) trading in the securities market and derivatives markets would continue to trade as normal if the underlying or linked instrument is under VCM.</p>

APPENDIX III: TWO COMMON TYPES OF TRADING MECHANISMS IN THE SECURITIES MARKETS

1. There are generally two types of trading mechanisms in securities exchanges, namely:
 - **Continuous Trading** (sometimes also known as Continuous Auction) whereby price discovery and order execution is continuous in a central limit order book. Continuous Trading is commonly used as the main trading session; and
 - **Single-Price Auction** whereby bid and ask orders are aggregated in a call phase and executed at a single price at which the tradable quantity is maximised. This is commonly used at the day open, day close, or after a prolonged period of non-trading.

Continuous Trading

2. During Continuous Trading, orders are either immediately executed when they are input to the central limit order book or queued in the order book for execution based on price time priority (i.e. orders with a lower (higher) ask (bid) price have priorities over other ask (bid) orders, and for orders of the same price, orders input earlier have a high priority).
3. To illustrate, when an order is entered into the order book, the matching engine would try to match it with the existing orders queuing on the opposite side in accordance with the price time priority. If it is an ask order, the system would try to match it with the existing best bid offer (highest buying price). If it is a bid offer, the system would match it with the existing best ask offer (lowest selling price). In addition, if there are two or more orders at the best bid or best ask, an order entered into the system at an earlier time must be executed in full before an order at the same price entered at a later time is executed.
4. Once an order is entered to the order book, it would either be executed (if matches) against the existing orders in the order book or queue in the order book (if no matches) for execution later. This process repeats until the end of Continuous Trading.
5. Please refer below to some examples of order matching in the CTS:

a.

Ask	Price	Bid
	103	1000
4000	102	
8000	100	
	99	3000
	98	4000
	97	4500

Current best bid is 3000 shares at \$99 and current best ask is 8000 shares at \$100.

A new limit bid order of 1000 shares at \$103 comes into the book.

b.

Ask	Price	Bid
	103	1000
4000	102	
8000	100	
	99	3000
	98	4000
	97	4500

The new 1000 shares limit bid order is matched with the best ask (with highest priority), which is the 8000 shares order at the lowest ask price of \$100, resulting in a trade of 1000 shares at \$100.

c.

Ask	Price	Bid
	103	-
4000	102	
7000	100	
	99	3000
	98	4000
5000	97	4500

Another new order – 5000 shares of limit ask order at \$97 comes in.

This new order is matched with the best bid (with highest priority) – 3000 shares at \$99.

d.

Ask	Price	Bid
	103	-
4000	102	
7000	100	
	99	-
	98	4000
2000	97	4500

The remaining 2000 shares are then matched with the remaining best bid order at \$98.

e.

Ask	Price	Bid
	103	-
4000	102	
7000	100	
	99	-
	98	2000
	97	4500

The table on the left shows the end of the order book after the trade execution.

Single-Price Auction

6. A single-price auction is commonly used by securities exchanges for price determination and trade execution. It can be broadly divided into three phases:

- **Order input phase:** Market participants input orders during this phase for execution at a single price, i.e. the closing price;
- **Price determination phase:** The closing price of a security is determined by using a pre-determined auction algorithm which maximises the tradable quantity; and

- **Trade execution phase:** Orders are matched at the closing price based on market order, price and time priority.

7. Please refer to below an example of a single-price auction:

a. Order Input Phase

Ask	Price	Bid
100k	>\$24.05	-
1000	At-auction	2000
800	\$24.05	200
600	\$24.00	1000
400	\$23.95	400
-	<\$23.95	50k

Market participants input at-auction and at-auction limit orders during the Call Phase. However, only orders in the overlapping range may be executed (in this example, these refer to the at-auction orders and at-auction limit orders between \$23.95 and \$24.05).

b. Price Determination Phase

Aggregate Ask	Price	Aggregate Bid
2800	\$24.05	2200
2000	\$24.00	3200
1400	\$23.95	3600

\$24.05 is determined as the official closing and execution price because it maximises the tradable quantity at 2200 shares.

Note: The tradable quantity is the lower number between the aggregate ask and bid quantity for each price.

c. Trade Execution Phase

Ask	Price	Bid
100k	>\$24.05	-
-	At-auction	-
600	\$24.05	-
-	\$24.00	1000
-	\$23.95	400
-	<\$23.95	50k

2200 shares would be executed based on order type (at-auction order first), price and time priority.

The table on the left shows the order book after the trade execution.

APPENDIX IV: EXISTING CLOSING METHODOLOGY (MEDIAN PRICE METHOD)

1. Currently, the closing price of a stock in the HKEx's securities market is determined by taking the median of 5 nominal prices¹⁸ in the last minute of the CTS. The system takes 5 snapshots of the nominal prices at 15-second intervals starting from 15:59:00. The 5 snapshot nominal prices are then arranged in ascending order and the median would then be taken as the closing price.
2. The following example illustrates the calculation:

Snapshot	Time	Bid Price	Ask Price	Last Recorded Price	Nominal Price
1 st	15:59:00	\$39.40	\$39.50	\$39.50	\$39.50
2 nd	15:59:15	\$39.40	\$39.50	\$39.50	\$39.50
3 rd	15:59:30	\$39.30	\$39.40	\$39.50	\$39.40
4 th	15:59:45	\$39.30	\$39.40	\$39.40	\$39.40
5 th	16:00:00	\$39.20	\$39.30	\$39.30	\$39.30

3. The 5 snapshot nominal prices are arranged in ascending order (i.e. \$39.30, \$39.40, \$39.40, \$39.50, \$39.50) and then the median (i.e. \$39.40) would be taken as the closing price. Choosing the median of 5 snapshot nominal prices ensures that the closing price would not be biased by a single trade concluded at a particular time.
4. The current closing price calculation method has been in use for a long time, starting initially with 3 snapshots of nominal prices. On launch of AMS in 1993, it was extended to 5 snapshots of nominal prices. The system generally takes a few seconds to complete the closing price calculation for the whole market.

¹⁸ The nominal price in the CTS is determined by comparing the current bid price, current ask price and last trade price / previous closing price, as the case may be. For details, please refer to Chapter 1 of the Rules of the Stock Exchange of Hong Kong.

APPENDIX V: PREVIOUS CAS MODEL

1. The previous CAS design mirrored the POS in order to minimise the cost and time for implementation. The design decision followed market feedback which indicated a preference for such an approach.
2. The previous CAS had three distinct periods as follows:
 - **Order Input Period:** 16:00 – 16:08 (8 minutes)
 - **Pre-order Matching Period:** 16:08 – 16:10 (2 minutes)
 - **Order Matching:** From 16:10 (normally completed within seconds)
3. Following the design of the POS, all securities were traded in the CAS. Securities Market Makers and Liquidity Providers were not allowed to participate. Short selling orders were also disallowed in the CAS.

Measures in the previous CAS to curb extreme price movement

4. As indicated above, the previous CAS had a Pre-order Matching Period to discourage gaming behaviour.
5. During this period, only at-auction orders (unpriced market orders in the auction session) were allowed, while at-auction limit orders (priced limit orders in the auction session) were prohibited. Since the range of the possible IEP was set by priced orders, permitting unpriced orders only during this period was aimed at preventing further fluctuation of the IEP range.
6. Another measure to curb extreme price movement was to disallow order amendments and cancellations in the Pre-order Matching Period, so that no last minute changes were permitted to affect the possible range of the IEP.
7. Outside the Pre-order Matching Period there were no anti-gaming features to curb extreme price movement built into the previous CAS model. Although HKEx had discussed another potential anti-gaming feature in the Consultation Paper published in 2007, i.e. random closing, it was not implemented. Market feedback at that time indicated a preference for a simpler design with minimal changes.

Previous CAS design failed to address price movements caused by a substantial order imbalance

8. The Pre-order Matching Period in the previous CAS in most cases appeared to limit large price movements effectively. However, where substantial at-auction orders were input near the end of the CAS that led to large order imbalances, coupled with an at-auction limit order with a highly aggressive price, the IEP could be moved to the extreme end of the executable range in a very short period of time. Since the previous

CAS closed at a fixed time, the market did not have enough time to react to sudden changes in the final moments of the CAS.

9. On 9 March 2009, the IEP of HSBC dropped over 11%, from \$37 to \$33, a few seconds before the end of the CAS. This sudden price movement was caused by a number of substantial at-auction ask orders input in the last few seconds before auction ended at 16:10, as well as an exceeding low-priced at-auction limit ask order priced at \$33 input during the Order Input Period. The resulting order imbalance on the sell side pushed the IEP and the closing price down to \$33. This incident led to the SFAT judgement concerning the “inherent instability” of the auction design (see paragraph 97 in Chapter 6).
10. To conclude, the previous CAS lacked effective measures to address extreme price volatility caused by a significant order imbalance. While the fixed closing at 16:10 provided the market with certainty on the exact closing time, it also left opportunity for possible gaming activities towards the very end of the CAS.

APPENDIX VI: FEATURES OF CLOSING AUCTION MODELS OF SELECTED OVERSEAS EXCHANGES

1. This appendix presents the key features of the CAS models adopted by certain overseas exchanges. The information presented is compiled on a best-efforts basis and is for background and reference purposes only. While every effort has been made to ensure that the information is accurate, some of the information may be outdated or incomplete because of changes in market practices over time. Readers are advised to consult the relevant exchanges for more details or further updates if necessary.
2. The CAS practices of the international exchanges can be summarised as follows and further elaborated in the table below:
 - **Order type** – Most exchanges allow both at-auction (market) and at-auction limit (limit) orders, including the NYSE, NASDAQ, LSE, SGX and many others.
 - **Security type** – Most exchanges apply the CAS to both equities and unit trusts. Some exchanges such as the US exchanges and DB apply the CAS to debt securities, and a few exchanges like KRX apply the CAS to structured products.
 - **Price limit** – Many exchanges have price limit in place during the CAS, for example, NYSE, NASDAQ, KRX, TSE, TWSE and SZSE.
 - **Random closing** – Many exchanges have random closing in place to end the CAS, namely LSE, DB, SGX, ASX and KRX.
 - **Allowing limit orders throughout the CAS** – All exchanges allow limit orders throughout the CAS.
 - **No-cancellation period** – Some exchanges like NASDAQ and NYSE do not allow order cancellation before the end of CAS.
 - **Short selling** – Most exchanges allow short selling in the CAS.
 - **CAS extension** – Some exchanges have CAS extensions in place if there is a market order imbalance or if a certain price limit is exceeded (e.g. LSE).

Table 3. Key features of selected overseas exchanges' closing auction sessions

Exchange	Order type	Security type	Price limit	Random closing	Allowing limit orders throughout CAS	No-cancellation period	Short selling	CAS extension
NASDAQ OMX	Market, limit, imbalance	Equities, unit trusts and debt securities	Yes (no more than 10% from the reference price - best bid or offer, etc.)	No	Yes	Yes (10 mins before auction matching)	Yes	No
NYSE Euronext (US)	Market, limit,	Equities, unit trusts and debt securities	Yes (the closing price cannot be \$1 or 10% away from the consolidated last sale)	No	Yes	Yes (15 mins before auction matching)	Yes	No
London Stock Exchange	Market, limit	Equities and unit trusts	No	Yes	Yes	No	Yes	Yes (up to 3 extensions)
Deutsche Börse	Market, limit	Equities, unit trusts and debt securities	No	Yes	Yes	No	Yes	Yes (minimum of 2 mins until manually terminated)
NYSE Euronext (Paris)	Market, limit	Equities and unit trusts	No	No	Yes	No	Yes	Yes (according to price collar - 10%)
Australian Exchange	Limit	Equities, unit trusts, debt securities and structured products	No	Yes (15 seconds for shares)	Yes	No	Yes	No

Table 3. Key features of selected overseas exchanges' closing auction sessions

Exchange	Order type	Security type	Price limit	Random closing	Allowing limit orders throughout CAS	No-cancellation period	Short selling	CAS extension
Korean Exchange	Market, limit	Equities, unit trusts, debt securities and structured products	Yes (±15% from previous closing price for equities)	Yes (when price fluctuates for >5% from the highest/lowest published price in the last 5 mins)	Yes	No	Yes	Yes (random end extension if price breach)
Shenzhen Stock Exchange	Limit	Equities, unit trusts and debt securities	Yes (10% of the last trade; plus full day price limit of ±5% to 10% of the previous close)	No	Yes	Yes	Yes	No
Singapore Exchange	Market, limit	Equities, unit trusts and structured products	No	Yes	Yes	No	Yes	No
Taiwan Stock Exchange	Limit	Equities, unit trusts, debt securities and structured products	Yes (±7% from the previous close)	No	Yes	No	Yes	Yes (when prices of certain stocks moves >3.5% in the last 1 min)
Tokyo Stock Exchange	Market, limit	Equities, unit trusts and debt securities	Yes (on a sliding scale based on previous day's closing price)	No	Yes	No	Yes	Yes

APPENDIX VII: TRADING TIMETABLE OF HKEX'S SECURITIES AND DERIVATIVES MARKETS AFTER INTRODUCTION OF THE NEW CAS MODEL

Securities market

1. After introduction of the new CAS model, the trading hours of the securities market would be as set out in Table 4 below:

Table 4. Securities market trading hours under new CAS model		
Trading sessions	Current trading hours	Trading hours with a CAS
Pre-opening Session	9:00-9:30	Same
Morning Session	9:30-12:00	Same
Extended Morning Session	12:00-13:00	Same
Afternoon Session	13:00-16:00	Same; note all non CAS Securities would close at the end of the Afternoon Session
CAS (applicable to all CAS Securities)		
Blocking		16:00-16:01
Order Input		16:01-16:08
No-Cancellation		16:08-16:10
Random Closing		16:10-16:12

Note: There would be CAS in half trading days as well, so that trading hours of the CAS Securities would be extended accordingly.

Derivatives market

2. The stock index futures/options (SIFO) market on HSI and HHI, Dividend Futures, HSI Volatility Index Futures and CES China 120 Index Futures closing time would be extended to 16:30 on normal trading days and to 12:30 on half-days as the case may be, except on the last trading day of the contract. The trading hours are set out in Table 5 below:

Table 5. Derivatives market trading hours under new CAS model

Products	Current trading hours	Trading hours with a CAS
1. Stock Index Futures: <ul style="list-style-type: none"> • Hang Seng Index Futures • H-shares Index Futures • Mini-Hang Seng Index Futures • Mini-H-shares Index Futures 	09:15-12:00 and 13:00- <u>16:15</u> After-Hours Futures Trading 17:00-23:45 Last Trading Day (Spot Month Contract): 09:15-12:00 and 13:00-16:00	09:15-12:00 and 13:00- <u>16:30</u> After-Hours Futures Trading <u>17:15</u> -23:45 Last Trading Day (Spot Month Contract): 09:15 - 12:00 and 13:00-16:00
2. Stock Index Options: <ul style="list-style-type: none"> • Hang Seng Index Options (Including Flexible Index Options) • H-shares Index Options (Including Flexible Index Options) • Mini-Hang Seng Index Options 	09:15-12:00 and 13:00- <u>16:15</u> Last Trading Day (Spot Month Contract): 09:15-12:00 and 13:00- 16:00	09:15-12:00 and 13:00- <u>16:30</u> Last Trading Day (Spot Month Contract): 09:15 - 12:00 and 13:00 - 16:00
3. Dividend Futures	09:15-12:00 and 13:00- <u>16:15</u> Last Trading Day (Spot Month Contract): 09:15-12:00 and 13:00- <u>16:15</u>	09:15-12:00 and 13:00- <u>16:30</u> Last Trading Day (Spot Month Contract): 09:15 - 12:00 and 13:00- <u>16:30</u>
4. HSI Volatility Index Futures	09:30-12:00 and 13:00- <u>16:15</u> Last Trading Day (Spot Month Contract): 09:30-12:00 and 13:00-16:00	09:30-12:00 and 13:00- <u>16:30</u> Last Trading Day (Spot Month Contract): 09:30-12:00 and 13:00-16:00
5. CES China 120 Index Futures	09:15-12:00 and 13:00- <u>16:15</u> Last Trading Day (Spot Month Contract): 09:15-12:00 and 13:00-15:00	09:15-12:00 and 13:00- <u>16:30</u> Last Trading Day (Spot Month Contract): 09:15-12:00 and 13:00-15:00
6. All other products	Various After-Hours Futures Trading starts at 17:00	No Change in the Morning and Afternoon Sessions After-Hours Futures Trading to start at <u>17:15</u>

APPENDIX VIII: PRIVACY POLICY STATEMENT

Privacy Policy Statement

Hong Kong Exchanges and Clearing Limited and from time to time, its subsidiaries, affiliated companies controlling it or under common control with it and its joint ventures (each such entity, from time to time, being "HKEx", "we", "us" or an "affiliate" for the purposes of this Privacy Policy Statement as appropriate) recognises its responsibilities in relation to the collection, holding, processing, use and/or transfer of personal data under the Personal Data (Privacy) Ordinance (Cap. 486) ("PDPO"). Personal data will be collected only for lawful and relevant purposes and all practicable steps will be taken to ensure that personal data held by HKEx is accurate. HKEx will use your personal data in accordance with this Privacy Policy Statement.

We regularly review this Privacy Policy Statement and may from time to time revise it or add specific instructions, policies and terms. Where any changes to this Privacy Policy Statement are material, we will notify you using the contact details you have provided us with and, as required by the PDPO, give you the opportunity to opt out of these changes by means notified to you at that time. Otherwise, in relation to personal data supplied to us through the HKEx website, continued use by you of the HKEx website shall be deemed to be your acceptance of and consent to this Privacy Policy Statement.

If you have any questions about this Privacy Policy Statement or how we use your personal data, please contact us through one of the communication channels below.

HKEx will take all practicable steps to ensure the security of the personal data and to avoid unauthorised or accidental access, erasure or other use. This includes physical, technical and procedural security methods, where appropriate, to ensure that the personal data may only be accessed by authorised personnel.

Please note that if you do not provide us with your personal data (or relevant personal data relating to persons appointed by you to act on your behalf) we may not be able to provide the information, products or services you have asked for or process your request.

Purpose

From time to time we may collect your personal data such as your name, mailing address, telephone number, email address and login name for the following purposes:

1. to process your applications, subscriptions and registration for our products and services;
2. to perform or discharge the functions of HKEx and any company of which HKEx is the recognised exchange controller (as defined in the Securities and Futures Ordinance (Cap. 571));
3. to provide you with our products and services and administer your account in relation to such products and services;

4. to conduct research and statistical analysis; and
5. other purposes directly relating to any of the above.

Direct marketing

Except to the extent you have already opted out or in future opt out, we may also use your name, mailing address, telephone number and email address to send promotional materials to you and conduct direct marketing activities in relation to our financial services and information services, and related financial services and information services offered by our affiliates.

If you do not wish to receive any promotional and direct marketing materials from HKEx or do not wish to receive particular types of promotional and direct marketing materials or do not wish to receive such materials through any particular means of communication, please contact us through one of the communication channels below.

Identity Card Number

We may also collect your identity card number and process this as required under applicable law or regulation, as required by any regulator having authority over us and, subject to the PDPO, for the purpose of identifying you where it is reasonable for your identity card number to be used for this purpose.

Transfers of personal data for direct marketing purposes

Except to the extent you have already opted out or in future opt out, we may transfer your name, mailing address, telephone number and email address to our affiliates for the purpose of enabling our affiliates to send promotional materials to you and conduct direct marketing activities in relation to their financial services and information services.

Other transfers of personal data

For one or more of the purposes specified above, the personal data may be:

1. transferred to our affiliates and made available to appropriate persons in our affiliates, in Hong Kong or elsewhere and in this regard you consent to the transfer of your data outside of Hong Kong; and
2. supplied to any agent, contractor or third party who provides administrative or other services to HKEx and/or any of our affiliates in Hong Kong or elsewhere.

How we use cookies

If you access our information or services through the HKEx website, you should be aware that cookies are used. Cookies are data files stored on your browser. The HKEx website automatically installs and uses cookies on your browser when you access it. Two kinds of cookies are used on the HKEx website:

Session Cookies: temporary cookies that only remain in your browser until the time you leave the HKEx website, which are used to obtain and store configuration information and administer the HKEx website, including carrying information from one page to another as

you browse the site so as to, for example, avoid you having to re-enter information on each page that you visit. Session cookies are also used to compile anonymous statistics about the use of the HKEx website.

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Corporate reorganisation

As HKEx continues to develop its business, we may reorganise our group structure, undergo a change of control or business combination. In these circumstances it may be the case that your personal data is transferred to a third party who will continue to operate our business or a similar service under either this Privacy Policy Statement or a different privacy policy statement which will be notified to you. Such a third party may be located, and use of your personal data may be made, outside of Hong Kong in connection with such acquisition or reorganisation.

Access and correction of personal data

Under the PDPO, you have the right to ascertain whether HKEx holds your personal data, to obtain a copy of the data, and to correct any data that is inaccurate. You may also request HKEx to inform you of the type of personal data held by it. All data access requests shall be made using the form prescribed by the Privacy Commissioner for Personal Data ("**Privacy Commissioner**") which may be found on the official website of the Office of the Privacy Commissioner.

Requests for access and correction or for information regarding policies and practices and kinds of data held by HKEx should be addressed in writing and sent by post to us (see contact details below).

A reasonable fee may be charged to offset HKEx's administrative and actual costs incurred in complying with your data access requests.

Termination or cancellation

Should your account with us be cancelled or terminated at any time, we shall cease processing your personal data as soon as reasonably practicable following such cancellation or termination, provided that we may keep copies of your data as is reasonably required for archival purposes, for use in relation to any actual or potential dispute, for the purpose of compliance with applicable laws and regulations and for the purpose of enforcing any agreement we have with you, for protecting our rights, property or safety, or the rights, property or safety of our affiliates and employees.

Contact us

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APPENDIX IX: GLOSSARY

<u>Terms</u>	<u>Definitions</u>
AMS/3.8	The Automatic Order Matching and Execution System/Third Generation, specifically the upgraded version of the Third Generation launched by HKEx in December 2011.
ASX	Australian Securities Exchange, the incumbent securities exchange in Australia.
At-auction Limit Order	An order type in the auction sessions which can be executed at or better than the specified price.
At-auction Order	An unpriced order type in the auction sessions.
Blocking Period	The period from 16:00 to 16:01 in the proposed CAS model. During this period, a reference price for each CAS security is determined and published. The reference price is used to set the permissible price range for each CAS security and the residing aggressive orders outside the price range would be rejected by the system. All other orders remaining from the CTS are automatically carried forward to the CAS.
CAS	Closing Auction Session which means a single-price auction at the end of the trading day for facilitating closing price determination and execution at this price.
CBBC(s)	Callable Bull/Bear Contract(s) which is a type of leveraged structured product that tracks the performance of an underlying asset(s) without requiring investors to pay the full price required to own the actual asset. They are issued either as Bull or Bear contracts with a fixed expiry date and a knock-out feature, allowing investors to take bullish or bearish positions on the underlying asset(s).
CME	Chicago Mercantile Exchange
Continuous Trading	A trading mechanism which may also be known as Continuous Auction under which there is continuous price discovery and order matching in a central limit order book. Generally orders are matched based on price time priority.
Continuous Trading Session or CTS	The Continuous Trading Session of the securities market refers to the trading session from 09:30 to 12:00 and 13:00 to 16:00 in

each trading day. The Continuous Trading Session of the derivatives market generally refers to the trading session from 09:15 to 12:00 and 13:00 to 16:15 in normal trading days, or from 09:15 to 12:00 and 13:00 to 16:00 in the last trading day.

Cooling-off Period	A temporary period during the Continuous Trading Session whereby normal price discovery and trade execution are interrupted. During the Cooling-off Period, the instrument affected may only trade within the price limit set before the cooling-off. Any incoming aggressive orders outside the price limits would be rejected immediately.
DB	Deutsche Börse
DW(s)	Derivative Warrant(s), a type of leveraged and structured product which gives an investor the right to “buy” or “sell” an underlying asset at a pre-set price prior to a specified expiry date.
EP(s)	Exchange Participant(s), which is a corporation who may trade on or through the Exchange and is licensed under the Securities and Futures Ordinance to carry on securities/futures/options dealing activity.
ETF(s)	Exchange Traded Fund(s), which is a passively managed and open-ended fund designed to track the performance of its underlying benchmark (e.g. an index, a commodity such as gold, etc.) and offer investors an efficient way to obtain cost-effective exposure to a wide range of underlying market themes.
Eurex	Eurex Exchange which is a German-based derivatives exchange.
G20	The Group of Twenty consists of 20 major economies in the world including 19 individual economies and the European Union.
HHI	H-shares Index
HKEx	Hong Kong Exchanges and Clearing Limited
HSCEI	Hang Seng China Enterprises Index
HSI	Hang Seng Index

ICE	Intercontinental Exchange
IEP	Indicative Equilibrium Price, which is the indicative price for trade matching during an auction should the auction end at that time.
IEV	Indicative Equilibrium Volume, which is the indicative volume for trade matching during an auction should the auction end at that time.
IOSCO	International Organization of Securities Commissions, which is an association of organizations that regulate the world's securities and futures markets.
KRX	Korea Exchange, the incumbent securities exchange in Republic of Korea.
LSE	London Stock Exchange, the incumbent securities exchange in the United Kingdom.
MCH	The HKEx code for the Mini H-shares Index Futures, of which the underlying index is the Hang Seng China Enterprises Index.
MHI	The HKEx code for the Mini-Hang Seng Index Futures, of which the underlying index is the Hang Seng Index.
MOC Order	Market-on-Close Order, which is an order with an objective to trade at the closing price.
MSCI	Morgan Stanley Capital International, which is a US-based provider of indices for various asset classes.
No-Cancellation Period	The auction period from 16:08 to 16:10 in the new CAS model. During this period, EPs would be able to enter both at-auction orders and at-auction limit orders within the best bid and best ask. The orders entered cannot be cancelled or amended.
Order Input Period	The auction period from 16:01 to 16:08 in the proposed CAS model. During this period, EPs would be allowed to enter at-auction orders and at-auction limit with a proposed price limit of 5% from the reference price. Orders entered during this period would be able to be cancelled or amended.
OSE	Osaka Securities Exchange
OTP-C	Orion Trading Platform – Cash, HKEx's next generation

trading platform to be implemented for the securities market.

POS	Pre-opening Session, a trading session of 30 minutes which takes place before the securities market of Hong Kong starts trading at 09:30. It determines the opening price of a security and allows execution at that price.
Price Limits	An automated price volatility safeguard mechanism which imposes a temporary trading restriction in the trading of a major equity product or index, in case of extreme and uncontrolled price volatility that moves prices beyond a pre-set price threshold.
Random Closing Period	The period between 16:10 to any random point up to 16:12 in the proposed CAS model. During this period, order input and other associated rules would follow those of the No-Cancellation Period. CAS would end randomly during this 2-minute period for all CAS Securities with order matching starting immediately afterwards.
REIT(s)	Real Estate Investment Trust(s), which is a collective investment scheme that aims to deliver a source of recurrent income to investors through focused investment in a portfolio of income-generating properties such as shopping malls, offices, hotels and service apartments.
SFAT	Securities and Futures Appeals Tribunal, a review body which may review, on application, the merits of a range of regulatory decisions made under the SFO by the SFC, the Hong Kong Monetary Authority and an investor compensation company recognised by the SFC, and to hear and determine any question or issue arising out of or in connection with any review.
SFC	Securities and Futures Commission. An independent statutory body that regulates the securities and futures markets in Hong Kong.
SGX	Singapore Exchange
Single-Price Auction	Also known as Call Auction, a trading method that aggregates bids and offers, determines a single price by maximising tradable quantity, and allows trade execution at this price.
Stock Connect Securities	In this context it refers to the securities listed and traded on SEHK which may be traded under the Shanghai-Hong Kong Stock Connect pilot programme.

TOCOM	Tokyo Commodity Exchange
Trading Halts	Temporary suspensions in the trading of securities, usually in anticipation of price sensitive news announcement.
TSE	Tokyo Stock Exchange
VCM	Volatility Control Mechanism which is an automated mechanism whereby in case of extreme and abrupt price volatility that moves prices beyond a pre-set threshold in a very short time span, a pause or cooling-off period is triggered in the trading of the instrument concerned, or of the market as a whole.

