Effectiveness of Market Interventions in Emerging Markets

Final Report

EMERGING MARKETS COMMITTEE
OF THE
INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS

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List of Abbreviations

ASIC	Australian Securities & Investments Commission
KLCI	FTSE Bursa Malaysia KLCI
KOSPI	The Korea Composite Stock Price Index
MiFID	Markets in Financial Instruments Directive
SET	The Stock Exchange of Thailand
SVS Chile	Superintendencia de Valores y Seguros
TA-25	Tel Aviv 25 Index

Chapter 1 Objective, Background and Approach

Introduction

A striking feature of the global financial crisis of 2007-2008 was the speed at which financial market volatility was transmitted across the globe. The contagion effect of the crisis resulted in severe volatility being observed across geographical boundaries as well as across different asset markets, with such fluctuations continuing over extended periods during the peak of September and October 2008. Although the root of the crisis stemmed largely from a number of developed markets, emerging markets were also affected, with almost all emerging market jurisdictions reporting at least one if not more episodes of volatility in their capital markets during this period. While many of the world's stock exchanges experienced the worst declines in their history, with an average drop of around 40% in most indices, the MSCI Emerging Markets Index fell about 20% during the height of the crisis.

The IOSCO Emerging Markets Committee (EMC) Report on the *Impact on and Responses of Emerging Markets to the Financial Crisis*[1], published in September 2009, had observed that trading halts, circuit breakers and market closures were among some of the principal measures taken by emerging market regulators, to reduce instability in their markets during the global crisis. While a large proportion of emerging markets have some form of market intervention framework in place, the extent to which such interventions are imposed differ across jurisdictions.

The IOSCO EMC Working Group on the Regulation of Secondary Market (EMCWG2) was been tasked to examine the effectiveness of intervention measures such as trading halts and circuit breakers to control price volatility. In addition, where measures were taken to close markets, EMCWG2 was also asked to review the effects of such closures in mitigating the impact of the market volatility.

The significance of the mandate was further reinforced and has increasing relevance in light of the US *flash crash* on 6 May 2010. The mandate takes into account the discussion and issues that have been raised, as well as some of the market intervention measures that have been taken by regulators and/or exchanges to reduce the risk of sudden disruptions and erroneous trades.

Against this backdrop, the mandate examined the application and effectiveness of market interventions, and the regulatory issues arising. The report considered other related work conducted by IOSCO, including the IOSCO Technical Committee *Report on Trading Halts and Market Closures*[2] published in 2002, which examined the application of interruptions in developed markets.

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1 *Impact On and Responses of Emerging Markets to the Financial Crisis*, Report of the Emerging Markets Committee of IOSCO, 18 September 2009, available at http://www.iosco.org/library/pubdocs/pdf/IOSCOPD307.pdf

2 *Report on Trading Halts and Market Closures*, Statement of the Technical Committee of IOSCO, November 2002 , available at http://www.iosco.org/library/pubdocs/pdf/IOSCOPD138.pdf

Scope and Approach

A project team[3], led by the Securities Commission of Malaysia, gathered information for this report via a survey questionnaire distributed to all EMC members. The survey questionnaire was formulated with a view to ascertain core issues relevant to emerging markets in relation to market intervention measures.

The survey questionnaire comprised 29 questions which broadly cover the following areas:

- Current approaches to market interventions – the survey sought to identify the current market intervention rules, tools and practices adopted by emerging market regulators and/or exchanges and the communication protocols involved when market interventions are imposed, both domestically and internationally;

- Imposition of interventions during the global financial crisis – the survey sought to identify the types of market interventions imposed during the global financial crisis as well as the events and trading patterns leading up to the imposition of the interventions, and whether the interventions achieved the desired results; and

- Key regulatory issues and challenges – the survey sought to gather regulatory issues and challenges which may arise when imposing market intervention measures[4].

Responses were received from 29 emerging market jurisdictions[5]. In terms of geographical spread, there were 8 responses from Africa and the Middle East, 4 from Europe, 9 from South America and 8 from Asia.

A summary of the survey responses was discussed at the IOSCO Annual Conference in Montreal in June 2010. Discussions were also held with developed market exchanges on relevant issues relating to the imposition of market interventions.

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3 The project team consists of securities regulators from Argentina, Thailand, India, Indonesia, Romania and Morocco.

4 Survey responses were collated in January 2010, and therefore did not take into account emerging market regulators' concerns/issues following the "Flash Crash" on 6 May 2010.

5 Responses were received from the IOSCO ordinary members from Argentina, Bermuda, Brazil, Chile, Chinese Taipei, Colombia, Costa Rica, Czech Republic, Dubai, India, Indonesia, Israel, Jordan, Kenya, Korea, Malaysia, Nigeria, Oman, Pakistan, Panama, Peru, Poland, Romania, South Africa, Sri Lanka, Thailand, Trinidad and Tobago, Turkey and United Arab Emirates.

Chapter 2 Types of Market Interventions in Emerging Markets

Introduction

A fair and orderly trading environment is key to maintaining a vibrant and well-functioning securities market. Market interventions are aimed at preventing potential market disorder and/or restoring order in a trading environment that may be under stress. By providing a break in trading or a limit to trading, interventions are intended to provide the opportunity for information to be disseminated widely and equally, for market participants to reconsider their trading decisions rationally in light of new information and to serve as a signal of potential order imbalances in the system.

For the purposes of this Report, discretionary and automatic market intervention measures closely follow the definition outlined in the 2002 *Report on Trading Halts & Market Closures*[6]. Market interventions can be classified into two categories as follows:

- Discretionary
    - Trading Halts
    - Market Closures
- Automatic
    - Price Limits
    - Circuit Breakers

Discretionary market interventions are imposed by the exchange or regulator, usually in anticipation of the imminent release of material news about an issuer, or in reaction to extraordinary events. Trading halts may range from five minutes to even the rest of the day, depending on the severity of the news announcements.

Automatic market interventions are imposed in non-discretionary ways on the basis of pre-set limits. These interventions work in such a way that significant fluctuations in a security's or index price would trigger an automatic halt in the trading of the security or a suspension of the entire market. The duration of automatic trading halts are usually much shorter than discretionary ones.

The survey responses show that the majority of the emerging markets respondents have in place a combination of market intervention measures. All respondents have trading halts, 28 out of 29 respondents have market closures, 24 out of 29 have price limits while only 9 out of 29 have circuit breakers in place. Circuit breakers appear to be the least widely used by emerging market respondents.

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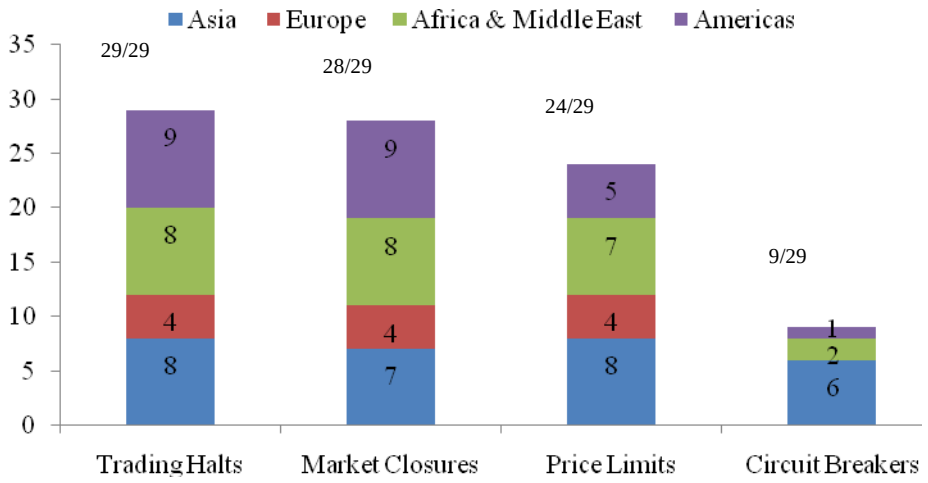
6 See footnote 2.

It is also observed that market interventions are applied most commonly to the equities market, while some subject other markets to trading halts, price limits and circuit breakers including debt securities and derivatives.

Figure 1: Types of market intervention measures in place in emerging markets surveyed



2.1 Trading Halts

Trading halts have emerged as the most common form of market intervention. The survey results show that all emerging market respondents have in place a framework for trading halts on individual securities. Trading halts are most commonly used to allow for dissemination of material information to the market. Trading may also be halted if there is suspected fraudulent or manipulative activity, if the issuer fails to meet listing standards or if there is excessive volatility.

For halts imposed in relation to the dissemination of material information, the survey responses show that only a few jurisdictions have fixed rules/criteria for the duration of halts and the duration of the halt may depend on nature of the material announcement to be made. The duration of the halts may range from a minimum of 10 minutes to one day from the time the material announcement is made. For example in Oman, trading is halted between 10 to 15 minutes, while in Chile, Korea and Romania, trading halts last for 30 minutes. In Malaysia, trading is halted for an hour while in Indonesia, halts can last up to one day.

It is observed that most developed market jurisdictions also have in place fixed and transparent rules on the length of trading halts in their markets, with the aim to keep trading halts as short as possible to minimise disruption to market. For example, Australia has a 10 minute halt for market-sensitive announcements, while Japan has a 30 minute halt period. On the other hand, the UK halts stocks on a case-by-case basis prior to a price-sensitive announcement.

For halts imposed other than for the dissemination of information, it is observed that the duration of these halts is dealt with on a case-by-case basis and is dependent upon the discretion of the regulator and/or exchange. However, there are some jurisdictions that have rules outlining the maximum number of days allowed in halting or suspending the security. In Chile, the stock exchange can halt or suspend a security for up to 5 days. A longer halt

would then require the authorisation of SVS Chile, which has the power to halt or suspend a security for up to 30 days.

2.2 Market Closures

The survey responses show that almost all emerging market respondents have provisions to close their markets under extraordinary events. In most cases, the regulator has the power to close a market. In some instances, the government's approval is required for a market to be closed. For example in Israel, the regulator and/or the exchange can close the market. However, if closure is more than a day, then the Minister of Finance's approval is required. Similarly in Jordan, if closure is for more than a week, the Prime Minister's approval is required.

Based on survey findings, it is observed that the duration for market closures generally depends on severity of event. Few jurisdictions have set out the maximum period that a market can be closed. The maximum number of days ranges from 30 to 120 days.

In Poland, the market can close up to 1 month, Costa Rica up to 2 months, while Chile can close its market up to 4 months. In Peru, its market can be closed up to one year. On the other hand, in a number of emerging markets, for example Colombia, Dubai, Kenya, Malaysia Panama, and Thailand, there are no stipulated limits to the number of days a market can be closed.

While market closures are generally rare, there have been a couple of instances where markets[7] were closed during the peak of the global financial crisis. For example, Indonesia closed its market for three days following drastic fall of its index in October 2008. In Romania, two market closures were imposed in October 2008 due to increased market volatility and the index falling by 12%. The first incident involved the market being closed until the next day, while the second incident involved market suspension for one hour and was resumed with a pre-opening phase. In Peru[8], three market closures were imposed around the same period. On 6 October 2008, the market was closed once for 30 minutes, on 10 October 2008, the market was closed twice, for 30 minutes and 1½ hours respectively, and on 24 October 2008, the market was closed once for 4 hours.

There are other instances where markets were closed, due to either political or social turmoil. For example in Thailand, a fire broke out on the ground floor of the Stock Exchange of Thailand's headquarters in May 2010 and the stock exchange was closed for the afternoon on 19 May 2010. Subsequently, the Exchange announced that it would close for the following two days.

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[7] Other jurisdictions (non-survey respondents) that closed its markets include Kuwait and Russia. Kuwait closed its market for 2 days in November 2008, following a court ordered to protect investors from further losses after the bourse's main index slid to the lowest since July 2005. Russia closed its market for 4 consecutive days in September 2008, and 3 consecutive days in October 2008 due to extreme market volatility.

[8] Peru does not have provisions for automatic market interventions, i.e. price limits or circuit breakers. It only has provisions discretionary market interventions, i.e. trading halts and market closures.

2.3 Price Limits

Price limits are price bands that set a price ceiling and floor and prohibit trading outside of those limits. It is a control mechanism to reduce sharp swings in security prices, to signal to the market operators any potential imbalances in particular securities or to help stop trade orders that are made in error.

Survey responses show that a majority of emerging markets have provisions for price limits, mainly applicable to the equity market. It is observed that price limit bands vary between ± 7% to ± 50% of the last closing price. Examples of different limits are ± 7% in Chinese Taipei, ± 30% in Malaysia[9] and Thailand, and ± 50% in Czech Republic. During the global financial crisis, the Karachi Stock Exchange in Pakistan set a floor for share prices to limit losses due to a drastic fall in the index for four months. Securities could trade within their daily limit of 5% but not below the floor-price level after the imposition of floor became effective.

There are many forms that price limits can take and different jurisdictions apply them in different ways. In most instances, trading *within* those limits is still permitted. In Malaysia and Thailand, the limit on the traded price of a security on any given day is at ± 30% from the previous day's closing price. However, trading in the security does not halt when the limit is reached. Instead, trading continues but must be within the ± 30% limits. In Trinidad & Tobago, the order price must be within ± 10% of the previous day's closing price. There is an automatic order rejection when an order exceeds 10% above or below the previous day's close.

In other instances, trading may be halted for a few minutes once the price ceiling or floor is reached. This may be analogous to a stock-specific circuit breaker. In jurisdictions such as, Argentina, Panama, Costa Rica, Brazil, Sri Lanka, Czech Republic, trading of the security is suspended temporarily when the price limit is hit. In Argentina, the price limit is set at ± 10% for the first time and ± 5% subsequently. Trading is halted for 15 minutes each time and if the variation reaches ± 20% limit, trading is subsequently halted for an additional 10 minutes. In Czech Republic, if the price limit of 20% is breached, trading is halted for 15 minutes and the maximum band of the price limit is 50%.

2.4 Circuit Breakers

Circuit breakers are automatic interventions across the market, designed to provide market participants the opportunity to pause and assess market conditions during significant market declines.

Survey responses reflect that only one third of emerging market respondents, a majority of them from the Asian region, have market-wide circuit breakers to deal with significant fluctuations in the main index. This may be largely attributed to the 1997 Asian Financial Crisis when a number of indices in Asia plummeted to record low levels.

In contrast, it is observed that emerging European markets do not typically have circuit

[9] This is applicable for securities with a Reference Price of ≥ RM 1.00. For securities with a Reference Price of < RM 1.00, the price band is ± 30 cents.

breaker mechanisms in place. Romania removed its provisions after the global financial crisis to be in line with rest of the European Union's practices and trends. A similar trend is observed in developed markets such as Australia, Hong Kong, Singapore and the UK.

Circuit breaker triggers are generally provided for in the rules of the exchange. Typically, the exchange has multi-level circuit breakers that close the market for a set period of time if the market falls a certain percentage, and then for a further duration if the market falls even further. Many countries implement two or three tiered circuit breakers, for e.g. at trigger levels of 10%, 15% and 20%, with the length of halt ranging from 30 minutes to two hours for the first one or two levels, and the rest of the day after the highest trigger.

The duration of the break or halt typically depends on the percentage the market falls, i.e. the halt will last longer if the percentage of decline is greater. Another variable is the time of day the circuit breakers are triggered. When the circuit breaker is triggered closer to the end of the trading day, trading will not resume that day.

In the past two years, five jurisdictions in the survey had circuit breakers triggered.

Table 1: List of jurisdictions' whose circuit breakers were triggered in the last two years

No.	Country	Date	Duration	Details
1.	Brazil	6 October 2008	30 minutes followed by 1 hour	Stock exchange Bovespa was suspended twice after the IBovespa index fell 10% and then 15%. The first 10% fall triggered a 30 minute circuit breaker. Trading then reopened and when the index fell to 15% trading was suspended again for another hour.
		22 October 2008	30 minutes	Triggered by fall in IBovespa index of 10%.
2.	India	22 January 2008	1 hour	Following Indian stocks plunging by 11% as investors joined an Asian-wide sell-off driven by concerns over the US economy.
3.	Israel	23 November 2008	45 minutes	TA-25 index fell by 11.1% (circuit breaker trigger limit is 8%).
4.	Malaysia	10 March 2008	1 hour	Triggered by fall in KLCI of 10% following the Malaysian general elections held on 8 March 08. The activation of the circuit breaker had not impeded the resilience of the market. Clearing and settlement, and depository operations continued to work as normal.

5.	Thailand	10 October 2008	30 minute	10% plunge in Thailand's SET index.

The survey also revealed that a majority of jurisdictions which have circuit breaker provisions in place typically apply a downward-only limit. Only three emerging market respondents apply both downward and upward limits[10]. While the trigger of upward limits may be rare, it has occurred for example in India, where on May 2009, its upward limit was triggered for the first time following an unprecedented rise of 17% in the Sensex and the Nifty as a result of positive reaction towards the results of the general elections.

2.5 Alternatives to Address Market Volatility

In addition to the market interventions discussed above, survey responses and research have shown that exchanges in many jurisdictions have in place other intervention mechanisms and risk management controls and systems to preserve the integrity of the market, and these are applied to trading of securities and/or futures markets.

2.5.1 Side-Car

The Korea Exchange (KRX) has a sidecar scheme which was introduced in 2001. When the benchmark KOSPI futures contract moves more than 5 percent from the base price of the day for more than one minute, the KRX suspends the programme trading for five minutes.

2.5.2 Shock Absorbers/Speed Bumps

In the US, speed bumps are designed to slow down the pace of activity during such periods without closing the markets completely. While not as comprehensive as circuit breakers, speed bumps are designed to calm the stock and derivative markets during periods of unusual volatility. These less restrictive trading rules consist of price limits at levels much narrower than the levels recommended for the setting of *circuit breakers*, price limits and trading halts. These include *opening* price limits for stock index futures traded at the Chicago Mercantile Exchange (CME) or the New York Futures Exchange (NYFE) and which are effective only for the first ten minutes of trading, and *interim* price decline limits for stock index futures traded at the CME, Chicago Board Trade, Kansas City Board of Trade, and NYFE.

2.5.3 Static Collar

In Europe, NYSE Euronext implemented supplementary trading threshold mechanism known as the *Static Collar*[11] following the *flash crash*. The static collar range defines the maximum percentage deviation of the market price from the static reference price in a relevant instrument. In case an incoming order triggers the static collar threshold, the order will not be rejected and will remain in the central order book. This will lead to an automatic reservation of the instrument. In addition, all orders sent on the halted instrument will continue to be accepted during the reservation period.

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[10] India, Israel and Pakistan

[11] This feature acts as a trading threshold mechanism in the regulated markets for bonds and equities traded continuously only and do not apply for ETFs, warrants and certificates, nor for Bourse de Luxembourg instruments.

2.5.4 Freeze Parameters

In Canada, exchanges have a mechanism which acts as *freeze parameters*, designed to prevent erroneous trades. In the event of unusual price movements, these volatility parameters will kick in and trading in the stock *freezes*. These parameters are essentially price bands, with different bands set depending on the price range of the security. During the opening auction period, if a price entered is outside the price band for that security, then the security will go into delayed opening.

During continuous trading, the exchanges set particular price bands, again according to the stock price of a security. If an order for a security hits either the ceiling or floor of these bands, the order will be rejected. This is largely similar to price limits.

2.5.5 Pre-Trade Risk Management

In US, NASDAQ has Pre-Trade Risk Management (PRM) which provides member firms with the ability to set a wide range of parameters for orders to facilitate pre-trade protection. Using PRM, firms can increase controls on their trading activity and the trading activity of their clients and customers at the order level — including the opportunity to prevent potentially erroneous transactions.

2.5.6 Call Auction System

In US, UK and more recently India, a *call auction* system is practiced. For example, should the index move by more than 10%, the exchange moves into a call auction for 15 minutes. In a call auction, buyers and sellers place or modify their orders, and the system continuously shows a provisional price, at which the supply and demand curves intersect. Therefore for 15 minutes, orders would build up for both buy and sell and a single market-clearing price would be continuously computed and displayed. When the 15 minutes end, the market-clearing price that is discovered reflects a large number of orders. At the end of this period, a single price is announced and all orders that satisfy this price are matched.

2.5.7 Short Sales

On February 24, 2010, the US SEC adopted a short sale circuit breaker that when triggered, will impose a restriction on the prices at which securities can be sold short. The restriction will be triggered if the price of the covered security decreases by 10% or more from its closing price on the previous day, as determined by the listing market for the covered security. Once the circuit breaker is triggered, it will prohibit the execution or display of a short sale in that security at a price that is less than or equal to the current national best bid. The restriction will remain in effect the remainder of that trading day and the next trading day.

2.5.8 Unusual Market Activities Queries

In the event of unusual market movements, regulators and/or exchanges may also have pre-emptive warnings to investors and market participants. For example in Malaysia, the exchange would initiate an *Unusual Market Activities* (UMA) query or a *Market Alert* query upon detection of any irregular price and/or volume movement in a particular security, and

this is posted on the exchange's website. When an UMA query is initiated, the affected listed company must immediately make an announcement to clarify the cause of unusual market activities in the trading of its securities. A *Market Alert* on the other hand, is an alert initiated to caution the investing public on the possible irregular trading activities of a particular security. A *Market Alert* serves to alert investors to take note of the recent developments of the listed company, to exercise caution and due diligence on the trading of the affected securities and to guide their investment decisions based on fundamentals of the listed company.

Chapter 3 Regulatory Issues in Emerging Markets

The key objective of market interventions is to prevent and manage potential market disorder or market volatility and to restore trading in a fair and orderly fashion in a market environment that is under stress. Given the changes in the regulatory and market structure space, markets have become increasingly susceptible to sudden price movements, precipitous drops and typically have a higher potential for disruption which may undermine confidence in the integrity of the financial markets.

In addition, globalization and the resulting increase in the number of multi-listed securities and derivatives across jurisdictions have led to increasing interconnectivity of markets across the world. As such, volatility in one market can easily and rapidly be transferred to another market in a different jurisdiction, and thus panics are often seen to have large contagion effects. Recent experiences during the global financial crisis as well more recent events have led many regulators to reassess their regulatory approach towards market interventions.

The following section discusses the key regulatory issues arising from various market intervention approaches and its effectiveness in mitigating and addressing market disruptions. While the focus is substantially on emerging markets, the discussions also aim to draw on important lessons gained from experiences faced in many of the developed markets.

3.1 Changing Trading Landscape and the Impact on Regulatory Approach

Markets have undergone profound changes in recent years. The sophistication of high frequency trading, proliferation of electronic trading platforms, and greater interconnectivity between markets have posed higher risks to both the trading environment as well as increased challenges to regulatory oversight and supervision as regulators deal with the speed at which transactions are being executed and markets are becoming more fragmented.

Significant and rapid increase in high-frequency trading have become increasingly common in many developed markets, and these advances in technology have dramatically altered the way in which orders are executed where rapid algorithms trigger buy and sell orders in microseconds. Even exchanges that traditionally enjoy monopoly status are increasingly under pressure to adapt to changing technological and investor needs and demands. For example in 2010 alone, exchanges in Japan, Singapore, Australia and the UK have upgraded the speed of their trading systems moving from milliseconds to microseconds[12].

A further related development is the rise of alternative trading systems (ATSs). While ATSs like dark pools and electronic communication networks (ECNs) may be prominent features in the US and European markets, these off-exchange platforms are increasingly venturing into

[12] The Singapore Stock Exchange announced its Reach initiative, which will launch what the firm bills as the world's fastest trading system by the first quarter 2011. The new system will allow the exchange to execute trades in 90 microseconds compared with 3 to 5 milliseconds now. High-frequency trading already accounts for 30 percent of volume on the exchange. The Hong Kong Exchanges & Clearing is also reported to be upgrading its trading system next year to boost speed, aiming for order flow from the mainland. It's goal is to have a trading system by the end of 2011 that can process 15,000 transactions per second, up from 3,000 transactions per second.

Asian[13] markets such as Japan, Hong Kong and Australia and are starting to be introduced in emerging market jurisdictions. For example, the Johannesburg Stock Exchange has become the latest exchange to create a dark pool block trading system.

As competitive pressures in the exchange environment builds, innovation becomes increasingly important. While high frequency trading and alternative trading systems may not be as prevalent in emerging markets, the existing regulations in these markets typically do not prevent these facilities from being established or introduced, and it is anticipated it would only be a matter of time that these alternative trading platforms and high frequency trading will feature more prominently in emerging markets. Emerging markets which are typically smaller and less liquid may be attracted by the promise of more liquidity, which can make investing and trading cheaper and facilitate the raising of capital[14].

In light of this, regulators and exchanges in emerging markets can no longer rely on legacy rules and will need to revisit their existing frameworks to ensure that the rules and volatility parameters continue to remain effective in the environment in which they operate. Regulators should therefore regularly review their existing powers, operational structures, approaches and regulations to ensure they are sufficient to meet potential emerging risks in the new trading environment.

3.2 Trading Halts

Trading halts can generally be classified in two categories. The most common halt is usually imposed at the request of the issuer for the dissemination of material information. The other is usually imposed by the regulator and/or exchange when there is unusual trading behaviour in the market, failure of companies to comply with listing rules or disclosure obligations, or if there is suspicion of fraud or manipulative trading activity in the particular security.

For trading halts relating to the dissemination of information, it is observed that the criteria and duration for these types of halts are usually more clearly outlined in rules, providing an element of certainty to the investing community. In contrast, where trading halts are imposed for reasons other than the dissemination of material information, the parameters, criteria and duration of these halts are generally wide and imposition of halts are evaluated on case-by-case basis. In this instance, the halt may last for as long as the issuer addresses the breach or the regulator and/or exchange to complete its investigation or to determine the reason for the volatility.

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[13] There are already six off-exchange operators in Japan that cater to investors looking for faster execution or anonymity. Dark pool operator Chi-X Japan is reported to be commencing trading services there in July 2010, offering smaller price increments for equities and staying open longer than the Tokyo Stock Exchange. Nomura, which launched a dark pool in Japan in end 2009, has also introduced a similar venue in Hong Kong in June 2010. SGX, for one, has formed a joint venture with dark pool operator Chi-X Global to develop Asia's first exchange-backed dark pool. Known as Chi-East, the platform will start operations by the second half of 2010.

[14] For instance, it is reported that high-frequency trading (estimated to be responsible for about 60 percent of U.S. stock trading) is being introduced in some emerging markets, particularly in Latin America and Europe. In Brazil, high-frequency trading is beginning to make inroads, and some relatively smaller markets, such as Colombia, are encouraging major U.S. trading firms to introduce innovative trading technologies.

Given that the reasons and duration of these halts vary from case to case, and in exceptional cases, where halts can be for longer periods of time, it is essential for regulators and/or exchange to provide a higher degree of certainty and transparency for market participants and investors. This includes having clear rules outlining the circumstances under which trading in a security would be halted and the duration it would be halted for, thus reducing the *discretionary* element and providing transparency to the market as to how and when trading halts are applied. For example, when the Bombay Stock Exchange suspended trading in a batch of securities[15] for non-compliance with exchange requirements, the exchange communicated via news channels that the length of the suspension period is dependent on the time taken by the listed issuer to comply with the listing requirements. The full list of companies suspended and reasons for suspension are subsequently posted on the exchange's website.

In Australia, ASIC provides clear guidance and protocols on its website for investors in the event the trading of a security is suspended. Investors are directed to contact the investor relations of the listed company and to enquire about the steps the company is taking to resolve the issue that led to the suspension of trading. In addition, any announcement from the company is also posted on the Australia Stock Exchange's website. In the United States, federal securities law allows the Securities and Exchange Commission (SEC) to suspend trading in any stock for up to ten trading days. The SEC provides guidance to market participants and investors in the event a stock is suspended by the regulator and/or exchange. It outlines the reasons for suspension, what happens when the ten day suspension period ends, whether trading automatically continues[16] after ten days and how investors can find out if the stock will trade again after suspension.

3.3 Market Closures

One of the key objectives relating to secondary markets that many regulators and exchanges abide by is to keep markets open and continuous to the greatest extent possible. As such, market closures are generally rare and are typically only imposed in extreme conditions.

It has been seen that the circumstances under which emerging markets have been closed vary ranging from natural disasters, social unrests and trading glitches. For example, the Shanghai and Shenzhen Stock Exchanges were closed in the afternoon[17] of 12 May 2008, following a

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15 Bombay Stock Exchange suspended trading of 26 companies for a month for non-payment of annual listing fees in August 2007. It further suspended trading in securities of 37 companies for non-compliance with various clauses of the listing agreement in December 2007.

16 Whether trading is resumed after a suspension is dependent on the market where the stock trades. Different rules apply in different markets. For stocks that trade in the OTC or the over-the-counter market, trading does *not* automatically resume when a suspension ends. Before trading can resume for OTC stocks, SEC regulations require a broker-dealer to review information about a company before publishing a quote. If a broker-dealer does not have confidence that a company's financial statements are current and accurate, especially in light of the questions raised by the SEC, then a broker-dealer may not publish a quote for the company's stock. In contrast to OTC stocks, stocks that trade on an exchange or Nasdaq resume trading as soon as an SEC suspension ends.

17 Stocks traded normally after the first earthquake hit at 2:28pm on Monday, May 12. Upon reviewing the extent of the damage, the exchanges subsequently closed their markets for the day. Trading resumed normally the following day. However, the Shanghai Stock Exchange continued to suspend trading in 45 companies and the Shenzhen Stock Exchange suspended 21, most of them based in Sichuan province.

7.9 magnitude earthquake in Sichuan Province. In Malaysia, trading was suspended for the entire day on 3 July 2008 following a multi-hard disk failure on its core trading platform. While in Thailand, the Stock Exchange closed its market for 2½ days in May 2010 due to political and social unrest.

As market closures are generally a form of discretionary intervention and market closure is more of a judgment call by regulators, the issue arises whether there is sufficiently clear and transparent criteria that guide the imposition of market closures. A lack of clear criteria and parameters may lead to a risk of misjudgment or *abuse* on the part of decision-makers. Without clear and consistent criteria, regulators and exchanges may also be subject to political and other pressures to close markets.

Research has shown that markets that close indiscriminately have negative consequences when they reopen, and may even lead to further downtrends. There may also be possible reputational damage and a measure of uncertainty in trading environment. During the stock market crash in 1987, one exchange was closed for four trading days. According to studies conducted[18], when the market reopened, prices fell drastically, making the jurisdiction one of the worst performers during the international market crash in 1987. Similarly, a review of price movements of jurisdictions that imposed market closures during the global financial crisis, showed that at best, there was a brief stabilization of prices immediately following the closure, but in the longer term, markets continued to decline in line with global markets.

As the existence of continuous trading is a fundamental objective for any marketplace, market closures are deemed to be extreme measures which should be used only as a last resort. It is imperative that market closures be guided by explicit criteria and protocols in order to maintain investor confidence and provide certainty in the marketplace. Further, the details of the closure including the duration of the closure and when market will be re-opened should be clearly and continuously communicated to investors.

3.4 Circuit Breakers

Circuit breaker mechanisms have come into considerable focus following the events of 6 May 2010, and there have been discussions as to whether having in place different trigger parameters for the market-wide circuit breaker would have reduced the impact of the *flash crash.*

During the *flash crash*, circuit breaker mechanisms in the US were not triggered despite the fact that the Dow Jones Industrial Average fell almost 1000 points within 20 minutes. Regulators and exchanges in the US are reviewing the existing parameters, with a view to considering lowering the threshold for market-wide circuit breakers beyond the current triggers set for 10%, 20% and 30% declines in the Dow Jones Industrial Average.

With the growing complexity of markets, there may need to be a review of the appropriate criteria, parameters and trigger levels of existing intervention mechanisms. A parameter that is too wide may not be effective in halting precipitous declines, while a parameter that is too narrow may result in too frequent interventions, causing disruption and confusion among

[18] Richard Roll, "The International Crash of October 1987"and Jong-Won Yoon "Do Circuit Breakers Stabilize Price Movements in Stock. Markets?".

investors and market participants alike.

The exponential growth of many emerging markets which started off at relatively low bases and operated under different structures and dynamics may also require a reconsideration of the existing frameworks. As an example, where a market index has doubled over ten years, it would be useful to reassess if a 10% trigger level that existed ten years ago would still be relevant and applicable in current market conditions.

A number of other issues may also be considered in designing appropriate circuit breakers:

- **Reference price**

A consideration to be made is whether the trigger for a circuit breaker should be based on a percentage change from a fixed reference price (e.g. the previous day's close or an average of the closing prices over several days), or whether the reference price should be dynamic (i.e. based on the speed at which a price move happens). For example, the former refers to a circuit breaker that is triggered when the reference stock price or index moves 10% from the previous day's closing price. The latter refers to a circuit breaker that is triggered when the reference stock price or index falls by 10% within any 10 minutes interval during a trading day.

- **Halt trading or allow continuous trading within limits**

Another consideration to be made is whether the trading in a market should be halted when a circuit breaker is triggered. Some developed market exchanges, for example the International Continental Exchange[19] has proposed that the market should remain open throughout, but temporarily reject offers outside the circuit breaker limits. This approach allows the market to continue trading at or even rally above the circuit breaker price if the drop was indeed induced by a panic or technical problem. In addition, it gives the order book time to rebuild such that trading is more orderly when the temporary price floor is removed.

- **Upward and downward triggers**

The survey responses revealed that a majority of emerging market respondents which have circuit breakers in place apply only downward limits. This pattern is observed to be similar in many developed markets.

There may therefore be an asymmetry of rules relating to circuit breakers where regulators can be said to be more tolerant and accepting towards significant and rapid upward movements of the index as opposed to corresponding downward movements. This may be largely attributable to the fact that a key concern for regulators is panic selling in the market due to irrational behaviour and therefore, circuit breaker triggers are largely set to prevent excessive downward movements and volatility in the market.

[19] Testimony of Charles A. Vice, President and Chief Operating Officer of Intercontinental Exchange before the Joint Advisory committee of the CFTC and US SEC on 22 June 2010.

Given that price limits apply both upward and downward movements, further consideration may need to be given as to whether a similar approach should be adopted for circuit breakers. Circuit breakers should be implemented both when markets fall and rise and not be biased towards movement in one direction only. The policy should be neutral as to the direction of market movements as the absence of an upward limit may affect market equilibrium.

- **Duration of a halt or limit when circuit breaker is triggered**

The duration of a halt or limit when a circuit breaker is triggered is another important factor to be carefully considered. This would depend on, among others, the speed at which information is transmitted in a market, the complexity of a market, the structure and composition of investors in the market and the circumstances under which circuit breakers could be triggered.

- **Index or stock specific circuit breakers**

In general, circuit breakers are triggered by a certain percentage move in a particular index and results in a pause in trading in the entire market. One issue that should be considered is whether circuit breakers are ideally triggered by an index, or whether they should be triggered by price movements in individual stocks (stock-specific circuit breakers), or both. There is currently considerable debate on this, with many arguing that circuit breakers on individual stocks may be more effective as a way of mitigating potential problems at an earlier stage.[20] By controlling volatility in trading of individual stocks, this would collectively and indirectly manage volatility in the entire market.

If an index is to be used, the appropriate index has to be carefully considered, whether it is an index of the top few stocks in a market or a more broad based index. Ideally, the chosen index should be one that is the most representative of what the regulator would want to manage or control.

If stock-specific circuit breakers are to be designed, considerations include the type of stock, liquidity, average daily volume and price in order to properly set the trigger for the circuit breaker. A standardized circuit breaker trigger across all securities may not be suitable, particularly where there are large numbers of low-value and low volume shares. For example, a stock that is trading around $1 may trigger a 10% limit more easily compared to a stock that is trading around $50. Separately, a low volume or

[20] The effectiveness of stock-specific circuit breakers is being closely monitored following the introduction of stock-specific circuit breakers in the US on a 6-month pilot basis.

In the recent stock-specific stock breaker in the US, the New York Stock Exchange, Nasdaq, BATS Global Markets, Direct Edge and other exchanges would temporarily halt trading in individual stocks in the S&P 500 Index when a stock price swings 10% up or down in the span of five minutes. These circuit breakers would be applied between 9:45 a.m. to 3:35 p.m. during the trading day across all domestic equity markets. In such cases, the stock's primary listing market notifies the other exchanges, who then also pause trading in that security on their markets.

Following up on that effort, in June, the SEC introduced proposals to expand the circuit-breaker program to all the stocks of the Russell 1000 index as well as 344 specified Exchange Traded Funds, hybrid mutual funds that have shares trading throughout the day like ordinary stocks.

thinly traded stock may also trigger the threshold more easily because any transaction in the stock will have a larger effect on the price of the stock.

At present, it is observed that a number of developed markets have circuit breakers for individual stocks which may be triggered when a particular stock trades above or below a benchmark price. For example, the London Stock Exchange's circuit breaker system automatically places any stock that is trading unusually lower or higher into a five-minute auction known as an automatic execution suspension period (AESP). The AESP will be triggered if the price of a stock is at up or down 3 percent to the previous price on the order book.

In Euronext and Deutsche Börse, if a stock trades unusually lower or higher taking into account historical volatility, trading is halted for two minutes. If after that two minute break the prices are still outside a predefined "pricing corridor", then the halt is extended while exchange market supervisors call market participants to confirm whether if the trades are genuine and are to be executed.

As discussed above, circuit breakers can be designed in many different ways. While there are no definitive answers on what would constitute an *ideal* circuit breaker, regulators may wish to carefully review some of the considerations highlighted here, study and test options that best suit their markets.

3.5 Coordinating Mechanisms across Equities and Derivatives Exchanges

The interconnectivity between equities and derivatives markets has grown immensely more complex over the years. Orders in one stock directed to one market can now ricochet to other markets and trigger algorithmic executions in other stocks and derivatives in milliseconds. With the rapid growth of derivatives markets, and the connected arbitrage with cash markets, it is critical for regulators to have in place coordinated measures between these inter-connected markets.

Survey results show that only 44% of emerging market jurisdictions halt trading in derivatives when the underlying stock is halted. While this may be largely driven by legacy issues where derivatives markets in emerging market jurisdictions may have been more recently developed as compared to the equities markets, it is essential for regulators to fully understand the correlation between the equities and derivatives markets and how they impact on one other. Focusing primarily on one market may mean that the regulators may not fully understand the transmission mechanisms and inter-linkages that are occurring, and therefore may not be able to exercise appropriate oversight over these markets.

For example, if trading in a particular stock in the equities market is halted, the regulator would need to assess the impact on the derivative whose underlying security is halted, and for trading in the relevant corresponding derivative to be suspended. If only one market is closed, the natural trading links between the two may result in trading pressures and order imbalances being transferred to the market that is still open. If this is the case, this may render a particular halt or closure less effective or create unwanted imbalances in the market.

One of the key issues arising from the decline in the US market on 6 May 2010 is possibly the disparate practices for dealing with major price movements and other unusual trading conditions across the exchanges in the US. For instance, while the NYSE trading floor

implemented circuit breakers during times of stress, other trading venues were able to continue trading. The fragmented nature of the US market and the different rules and policies adopted by the different exchanges were what many argue caused the effectiveness of the trading interruptions in place to be greatly reduced.

3.6 Communication and Coordination for Multi-Listed Securities

With the liberalisation and internationalisation of capital markets, markets have become increasingly interlinked through the increase in multi-listed securities and derivatives products. When considering measures to minimise market disruptions, regulators and exchanges should be mindful that the interventions imposed in one jurisdiction may have an impact on the securities or derivatives listed or traded in another jurisdiction, and there is therefore a need for appropriate cross-border communication and coordination of intervention measures among regulators and exchanges globally.

While multi-listed securities are much more common in developed markets, they are gradually increasing in emerging markets jurisdictions, and could pose ensuing challenges. When trading in a multi-listed security is halted, market participants may be able to trade the multi-listed security or derivative in another trading venue, giving rise to regulatory arbitrage and making the halt less effective. In this instance, survey responses show that only 33% of emerging market jurisdictions would impose a trading halt on a multi-listed security in their jurisdiction, when trading in the same security has been halted elsewhere.

As such, communication protocols ought to be in place among regulators and exchanges globally whereby the authority imposing the halt alerts and informs its counterpart where the same security is also listed about details of the halt, including the reasons and duration of the halt. The foreign market receiving the alert may then determine whether a trading halt should be imposed on the security or derivative. Authorities should also encourage issuers to communicate request for trading halt in a speedy and efficient manner, to ensure that the halt occurs in an orderly way across all trading venues where the stock is listed.

Survey responses show that emerging markets in the European Union appear to have a well established model of communication under Article 41 of the Markets in Financial Instruments Directive (MiFID) which requires suspension of a multi-listed instrument to be communicated to all authorities across the European Economic Area. Markets in other jurisdictions have some form of informal arrangements to facilitate communication and the exchange of information regarding trading halts in the context of multi-listed securities.

In terms of the types of information that regulators can share with each other, regulators and exchanges may wish to examine an arrangement that includes having a list of issuers who are also listed in other jurisdictions, and a list of each market's contact information.

The Technical Committee Report on *Coordination Between Cash and Derivatives Market*[21] in 1992 highlighted mechanisms to enhance communication between market authorities of

[21] *Coordination Between Cash and Derivative Markets - Contract Design of Derivative Products on Stock Indices and Measures to Minimize Market Disruption*, Report of the Technical Committee, October 1992, available at http://www.iosco.org/library/pubdocs/pdf/IOSCOPD22.pdf.

related equities and derivatives markets in the event of a market disruption. Regulatory authorities are encouraged to develop mechanisms to share information including contingency plans, contact persons and structural measures to address market disruption.

3.7 Effectiveness of Market Interventions

While this report has highlighted that there are a range of intervention practices across markets and varying issues faced in relation to market interventions, there remains an ongoing debate on the effectiveness and the costs and benefits of such measures.

On the one hand, it has been observed that trading halts give market participants the opportunity to absorb news and become more informed before trading, while circuit breakers provide investors with a *cooling off* period to calm fear and panic. Market interventions are also said to provide time for information flow in order to restore equilibrium between supply and demand in the market. A number of studies have found that market volatility is significantly lower in the reopening period than before the halt, suggesting that the trading halt has been successful.[22]

Conversely, opponents argue that halts are unnecessary barriers to price discovery and do not actually reduce volatility in trading following the lifting of the halt. For example, if fundamental information arrives at the time of the trading halt, the price adjustment process is delayed. This may in turn increase price uncertainty because no information is transmitted through trading when there is a halt. In addition, by preventing investors from trading during a halt, investors may be trapped in their positions. Some studies[23] showed that the volume and volatility in the first full trading day after a trading halt are both higher, hence lending the argument that trading halts increase rather than reduce both volume and volatility.

There has also been research that observed that the anticipation of market interventions can alter market behaviour. In particular, if market participants suspect that a trading halt or market closure will occur before they can execute their trade, they may trade earlier to increase probability of execution. Therefore, when trading halts are likely to occur, some traders may alter their trading strategy in anticipation of the halt, thereby increasing market volatility. This is often known as gravitational or magnetic effect.[24] Opponents also argue that trading interventions may induce panic and uncertainty if trading in securities or in the market is abruptly halted, thereby scaring away potential buyers and leading to panic selling. Elsewhere, research studies have found that in the event of a circuit breaker trigger, market participants responded that a circuit breaker trigger would not cause them to change their strategy, and would not lead them to advance trades[25].

Some emerging market exchanges have undertaken reviews of the effectiveness of market interventions in place. For example, with regards to trading halts, a study[26] conducted on the

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22 Including studies by Fabozzi and Ma (1988), Stein (1987), Greenwald and Stein (1988,1991) and Kodres and O'Brien (1994)

23 Lee et al (1994)

24 Harris (1998) and Subrahmanyam (1994)

25 Research conducted by the Federal Reserve Bank of Atlanta (1999)

26 "The Effectiveness of Trading Halts and Investor Trading Performance: An Intraday Analysis on the Stock Exchange of Thailand"

Stock Exchange of Thailand, found trading halts to be overall effective as they facilitate price discovery by allowing investors an opportunity to react to material information. In particular, it is found that prices and volatility tend to return to their normal levels within a short period of time after a halt.

Similarly, a study[27] conducted on the Istanbul Stock Exchange observed that trading halts are effective in allowing the dissemination of information and are useful in enhancing the efficiency of the price discovery mechanism. The study also highlights that most new information is absorbed within 15 minutes, and almost completely within an hour following the resumption of trading after a halt.

With regards to price limits, a study[28] on the effectiveness of price limits on Shanghai and Shenzhen Stock Exchange revealed that in a bullish period, price limits effectively reduce stock volatility for downward price movements, but not for upward price movements. Conversely in a bearish period, price limits effectively reduce stock volatility for upward price movements, but not for downward price movements.

More recently, the experience at the London Stock Exchange (LSE) on 23 August 2010 has shown that circuit breakers can prevent excessive volatility. The impact of the fall of five-LSE listed stocks was said to be limited due to its automatic circuit breakers kicking in when the losses in these stocks neared 10% and trading in them was suspended. The exchange then cancelled all sell orders on the stocks and reopened trading after five minutes, at which time the shares rebounded within a few minutes to their pre-crash levels.

It is observed that market interventions do play a role and have been shown to be effective in managing market volatility. However, the effectiveness of such interventions largely depends on the framework in place, the type and appropriateness of particular interventions and the consistency and suitability of rules in place in jurisdictions; thus reiterating the need for regular review by the authorities.

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27 "The Effects of Trading Halts and the Advantage of Institutional Investors: Evidence from the Istanbul Stock Exchange"

28 "The Effectiveness of Price Limits and Stock Characteristics: Evidence from the Shanghai and Shenzhen Stock Exchanges"

Chapter 4 Conclusion

Evidence suggests that irrespective of how efficient markets may be, exuberance and panic can still arise. Investors can behave irrationally and bubbles can form and subsequently burst, leaving markets to plunge at rapid speeds.

Regulators are often faced with the perennial question of whether and how they should intervene to manage irrational exuberance and panic in the market. While there are arguments for and against the imposition of market intervention measures, often a judgment call by the market authorities is required, and this may involve significant reputational risk.

It is observed that many jurisdictions have mechanisms in place to help prevent or at least mitigate the macroeconomic impact of market inefficiencies. Even markets which adhere to a generally free-market philosophy are seen to have some level of safeguards in place. Indeed, there is consensus that interventions are required in almost all markets to mitigate market disorderliness. The only difference seen between these markets is the extent to which interventions are applied and the forms of interventions adopted.

In terms of the extent and forms of interventions, the regulatory philosophy and the state of development of the individual markets are important considerations that require careful evaluation. Some markets which operate under a free market philosophy lean towards a framework with minimal intervention in order to keep trading continuous at all times. On the other hand, other markets, including a number of emerging markets, have regulatory frameworks that tend to be more protectionist in nature, where a basket of intervention measures are in place to protect the markets from extreme market volatility and severe market disruption. This includes interventions which are automatic and are based on pre-determined set of parameters (e.g. price limits and circuit breakers), as well as discretionary interventions that depend on the judgment of the authorities (e.g. trading halts and market closure).

While most emerging market jurisdictions have various forms of interventions, there appears to be a need for respective regulators to review and reassess the mechanisms in place to determine their relevance and continued effectiveness in the context of the current environment. Considerations include market structure, level of development of the market, sophistication of investors, and the degree to which any new tool would work together with existing tools and mechanisms in place to achieve their objectives. These mechanisms may be further complemented by robust surveillance and supervision, and well-developed and enforced corporate disclosure rules.

Regulators also need to carefully strike a balance between tailoring mechanisms according to their markets and benchmarking with international best practices and standards, when designing appropriate frameworks for interventions. The delicate balance is necessary in order to ensure cohesiveness in the frameworks of interventions adopted across the globe, while at the same time catering to the unique characteristics of each individual market.

The following are broad guiding principles in implementing measures to intervene in markets:

1. **Regular review of the framework governing interventions in light of the changing trading landscape.** Regulators need to keep pace and understand the transmission mechanisms involved as a result of changing trading landscape, in order to assess whether these developments could result in increased systemic risk or regulatory arbitrage. With changes in the regulatory and market structure space, regulators need to constantly adapt their intervention tools and adopt a pro-active approach to ensure they are able to manage emerging potential risks**.**

2. **Market interventions need to be considered in a holistic manner and not on a piece-meal basis.** When considering market intervention measures, regulators and exchanges need to review and analyse the basket of mechanisms already in place to ensure that the mechanisms achieve their objective of addressing extreme market volatility. The range of tools should not cause trading to be overly disrupted or deny market participants a continuous flow of market data during critical periods. Most importantly, the basket of tools should collectively provide net benefits to the market.

3. **Market interventions need to be transparent and explicitly guided by clear criteria and parameters**. Given that the driving principle for any market is transparency and efficiency, market intervention measures imposed should have clear rules and parameters. This is particularly important for market closures, which may have the most severe impact and reputational damage on markets. This is also to ensure that markets are not indiscriminately closed under political or stakeholder pressures.

4. **Market interventions must be consistently applied across all exchanges and/or markets to prevent regulatory arbitrage**. It is critical for regulators to ensure that rules on interventions aimed to ensure the stability and integrity of markets are consistent across markets, and that there is sufficient coordination between the equities and derivatives markets in order to ensure the effectiveness of such measures in meeting its purposes.

5. **A proper framework for coordination and communication between exchanges and/or regulators and exchanges for multi-listed securities is necessary**. Regulators and exchanges need to have protocols with their international counterparts to ensure multi-listed securities are handled in a fair manner in the event a trading intervention is imposed. In cases where securities are traded in more than one jurisdiction, regulators and exchanges should fully evaluate the risks that could arise from permitting a continuation in trading in securities where trading has been halted in the initial listing market, or vice versa.

In conclusion, measures taken to control undue market volatility may need to be viewed on a much wider basis as a means to mitigate potential systemic risk to the market, rather than simply tools relied upon to maintain fair and orderly markets. Regulators need to have intimate knowledge of their markets and assess and evaluate their individual market needs based on structure, dynamics and maturity before introducing any form of trading intervention. At the same time, benchmarking against international best practices and standards should be carried out to ensure that jurisdictions are aware of the latest issues and measures taken to intervene in markets that are taking place across the globe. Finally, a comprehensive review and assessment should be conducted regularly to determine that efforts to stabilise market volatility continue to be effective.

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