WORLD FEDERATION OF EXCHANGES

WFE Response IOSCO's Consultation Report on Market Outages

1st March 2024

Background

Established in 1961, the WFE is the global industry association for exchanges and clearing houses. Headquartered in London, it represents over 250 market infrastructure providers, including standalone CCPs that are not part of exchange groups. Of our members, 34% are in Asia-Pacific, 45% in EMEA and 21% in the Americas. WFE's 90 member CCPs and clearing services collectively ensure that risk takers post some $1.3 trillion (equivalent) of resources to back their positions, in the form of initial margin and default fund requirements. WFE exchanges, together with other exchanges feeding into our database, are home to over 50,000 listed companies, and the market capitalisation of these entities is over $100 trillion; around $140 trillion (EOB) in trading annually passes through WFE members (at end 2022).

The WFE is the definitive source for exchange-traded statistics and publishes over 350 market data indicators. Its free statistics database stretches back more than 40 years and provides information and insight into developments on global exchanges. The WFE works with standard-setters, policy makers, regulators and government organisations around the world to support and promote the development of fair, transparent, stable and efficient markets. The WFE shares regulatory authorities' goals of ensuring the safety and soundness of the global financial system.

With extensive experience of developing and enforcing high standards of conduct, the WFE and its members support an orderly, secure, fair and transparent environment for investors; for companies that raise capital; and for all who deal with financial risk. We seek outcomes that maximise the common good, consumer confidence and economic growth. And we engage with policy makers and regulators in an open, collaborative way, reflecting the central, public role that exchanges and CCPs play in a globally integrated financial system.

If you have any further questions, or wish to follow-up on our contribution, the WFE remains at your disposal. Please contact:

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Response

<u>Question 1: Do you agree with the key findings and/or do you think there are additional aspects of recent market outages that have not been captured?</u>

The World Federation of Exchanges (WFE) welcomes IOSCO's findings in this report that **market outages are few and far between**. The exchange community is proud to serve broader societies financing and investing needs by offering a reliable and quality service and reducing the number of market outages to a minimum is a key part of that.

Although the objective is to ensure there are no market outages whatsoever, market outages will happen. As IOSCO's survey shows, sometimes a piece of software, hardware or network will malfunction or not operate as intended. Despite all the risk mitigating practices employed by exchanges, there will be events, natural or manmade, that can cause disruption. For example, one market outage was barely avoided after a road repair crew cut through fibre-optic cables leading to an exchange by accident. Back-up links and redundant connections ensured that the outage was not as impactful as it could have been. This event was completely outside the exchange's control but something to which they had to respond, nonetheless.

Exchanges employ robust practices to prevent market outages from occurring. For example, exchanges undergo extensive testing and quality assurance procedures before rolling out new software. Exchanges dedicate important resources to ensure that markets run smoothly from open to close. It is for this reason that in 2022, exchanges across the world executed over 48.5 billion trades in equity shares[1].

In framing regulatory responses to outages, it is important that expectations are realistic, as outages are often idiosyncratic in nature. This means that the exchange in question is unlikely to know the exact cause of a problem or solution when it occurs. Therefore, the WFE is pleased to see that IOSCO and its constituent members favour industry guidance rather than a rules-based approach.

IOSCO's definition of a market outage

IOSCO states that: "A market outage occurs when the provision of essential services offered by a trading venue – such as order processing, trade execution or the publication of confirmed trades – is disrupted as a result of technical problems or operational issues, leading to a temporary suspension of trading." Whilst this definition is a helpful indicator, it is also simplistic.

We understand that IOSCO likely defined outages in the broadest possible way to capture outages in all of the jurisdictions surveyed. We do not necessarily see the need or benefit for an internationally harmonised definition of a market outage given the differences that exist between exchanges. Ultimately the occurrence of an outage must be defined by the individual exchange based on the prevailing facts, circumstances, materiality or significance and its regulatory framework.

However, it is important to note that each exchange should have a definition of an outage and it should be more specific than this, considering its specific regulatory obligations. Exchanges themselves will often have defined thresholds for inactivity , as they will be relied upon for determining when they enact resiliency or disaster recovery (DR) measures and strategies. By establishing clear parameters, exchanges can better assess the impact of outages, implement appropriate risk management measures, and take steps to minimize disruptions to market participants and the broader economy. This could form a further part of the best practice which IOSCO notes as exchanges themselves are best placed to identify when an outage has occurred and to ensure that fair and orderly trading takes place.

Actions of Market Participants and Regulators

The report carefully considers market outages but focuses on the actions of exchanges without fully considering other market participants or regulators. There is no consideration of the behaviours of market participants and regulators. Because we are all so

[1] WFE 2022 Annual Statistics Guide – Please note that this is the number of trades and not the number of shares traded which would be a higher number for which we do not have aggregated figures as of yet.

interconnected, we are of the view that market participant preparation is equally important when dealing with and preparing for an outage.

Since outages are so few and far between, as illustrated by the fact that some jurisdictions did not experience an outage in the surveyed period, when it occurs this would likely be considered a fairly unique event for market participants. Therefore, the preparedness of market participants and regulators is of the utmost importance, and we recognize that resilience exercises for the financial services sector are currently conducted.

Market participants should be prepared for outages and should be considering them in their enterprise risk management and operational resilience strategies. Market stakeholders could continue to benefit from sharing best practices in this area.

"Perceived" Price Formation

Finally, the WFE does not believe that it is accurate to say that "listing trading venues are generally *perceived* to be leading the price discovery process." It is not only correct to say that exchanges are *perceived* to lead price discovery, exchanges *do* lead price discovery. The price formation role arises due to exchanges operating models which are based on clear membership rules, total transparency and fairness to all participants. This is evidenced from the academic literature on the subject.[2] The resulting dip in trading activity during outages is, in part, further evidence of this central price discovery role that exchanges play in the marketplace.

Question 2: Do you agree with the good practices that IOSCO recommends for trading venues? If not, please explain why and provide further information.

The WFE is broadly supportive of the proposed good practices identified by IOSCO. They represent a high-level, yet comprehensive set of practices that should help ensure that exchanges are prepared for market outages.

Furthermore, we have some concerns with the good practices around communications and post- mortem analysis. Regarding, communications, whilst exchanges can and should make certain appropriate information is publicly available, it is the responsibility of intermediaries to communicate outages to their customers. Exchanges do not have information on all their members' customers nor could they be reasonably expected to have such information. As the complexity of connectivity and trading grows, exchanges need to ensure direct communication to their members first.

Concerning the publishing of the initial notice about the outage, this should be done as soon as practicable rather than as soon as possible, as there may be security and/or privacy concerns with public notification of the incident. Further, updates should be provided when there is new and relevant information that can be shared rather than characterizing updates as regular or at pre-defined intervals.

Concerning outage plans and post-mortem analysis for outages, it is important to consider the safety and security of the financial system before publishing them. Regulators would see more depth than is put into the public domain, but there is a risk that information gleaned from outage plans and post-mortem analysis could help nefarious actors to undertake cyber-attacks against exchanges and lead to further outages.

Finally, as IOSCO notes, the lessons learned and best practices developed were learnt by observing equities primary listing venues. Whilst the principles around good communication and being prepared for outages are relevant lessons, listing venues differ from other types of exchanges. For example, equities listing venues may have different trading protocols, settlement processes, and order matching algorithms compared to other venues like derivatives exchanges. Therefore, the best practices might not be entirely applicable.

[2] For example, Chakrabarty, Cox, & Upson (2022); Hasbrouck (2021); Hagströmer & Menkveld (2023)

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Question 3: Are there any other good practices that could be considered?

Firstly, and most importantly, the decision of an exchange to re-open after an outage should be primarily based on whether the exchange is ready to resume operations without compromising the integrity and stability of the market. Whilst recovery time objectives are a useful tool to aim for and benchmark against, there may be instances where rushing to reopen after an outage may lead to issues and erode confidence in the market. Discretion must be exercised when evaluating exchanges facing exceptional circumstances that impede the resumption of operations. Regulatory authorities and Exchanges may also want to consider member readiness, if they have been affected by an outage, and whether members are ready for the market to re-open.

Secondly, exchanges currently benefit from sharing of information and best practice with other exchanges. This is one of the reasons organisations like the WFE exist, and sharing of best practices around outages was a topic of conversation for the WFE's internal working groups in 2023. Various forums and venues for exchanging best practices currently exist, and the WFE does not believe another avenue is needed. It was agreed that continued collaboration between exchanges, where possible, in order to identify the risks and timing of re-integrating a firm who has been subjected to a cyber-attack can be beneficial.

Question 4: Do you agree that these good practices could also be useful for addressing other causes of market outages, such as those set out in Annex C? If not, please explain why and/or provide further information on what additional good practices may be relevant to these.

The WFE agrees that these good practices could be useful in addressing other causes of market outages.

Cyber attacks

The WFE agrees with IOSCO's analysis that cyber-attacks can lead to market outages, even where the venue is not directly attacked. This again underlines the consideration for best practices to be continued to be shared outside of the exchange community. The good practices identified here can be helpful for exchanges. However, there are likely extra steps with a cyber-attack, including discussing the response with other exchanges, market participants and regulators. There are existing forums where these discussions take place, and the WFE does not recommend creating additional forums or processes.

Natural events

The WFE agrees that natural events can lead to market outages. Depending upon the event, response times may be affected, underlining the need for discretion from regulators when considering a response.

In the context of disruption that the COVID-19 pandemic caused, the exchange community was able to adapt to the circumstances and keep global markets moving. Whilst the pandemic itself did not cause an outage, the lockdowns and forced work from home that many jurisdictions followed to prevent spread of the virus challenged how operations were conducted normally. Given the uncertainties and difficulties faced during the pandemic we were pleased to see that 2020 was not the year with the highest number of outages.

Material third parties

The WFE agrees that third parties can lead to market outages. However, IOSCO's focus here on cloud-service providers, misses the fact that exchanges are already well accustomed to managing their risks to third-parties effectively.

With regards to the cloud service providers themselves, exchanges manage their risk to them as they do other third parties through employing comprehensive operational resilience requirements and third-party risk management programs. Notwithstanding this, the likelihood of a cloud service provider becoming unavailable is quite small. This is because cloud-service providers do not operate one super-computer or super server but hundreds of thousands of servers, often worldwide. This means that, in the event that a particular piece of hardware malfunctions, a cloud-service provider can 'fail over' to another piece of hardware. This is much the same as an exchange failing over to its backup facility or having component redundancy built into their data centre environment. Cloud-service providers specialise in internet communications technologies and so are more likely than most financial services firms to be aware of issues and excel in this area.

Furthermore, there are many actors that participate in exchanges by providing trading services. How frontend software providers, hosting services and network providers (that are at times more or less concentrated across the sector) mitigate their risks is key. An outage by a network provider for example could affect numerous trading clients. The same goes for players such as large market data providers; for example, should Bloomberg or Refinitv experience outages and downtime, not only will various trading members and traders suffer if no secondary backups are in place, but market data provisions and reach to the whole market are severely impacted. All of these "service" elements could have an impact on market quality which needs to be assessed. Exchanges have robust Operational Resilience and Third Party Risk programs which include identifying important business services, critical third parties, exit plans and resiliency strategies for issues like these.

Terrorism

The WFE notes that outages related to terrorism or geopolitical conflicts, outside of cyber attacks, could be considered for inclusion in Annex C. For example, given current geopolitical conflicts, acts of sabotage against communication and energy infrastructure could cause an impact to markets if appropriate redundancy are not in place.