Best Practices

for

Organized Electronic Markets

Commodity Futures Trading Commission

Technology Advisory Committee

Market Access Subcommittee

24 April 2002

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1.0 Mission Statement and Scope

1.1 Mission of the Market Access Subcommittee

The mission of the Market Access Subcommittee[1] includes (1) addressing the public policy aspects of the nexus between applications of technology to organized markets and how those applications of technology might be used to facilitate or to frustrate fair and equitable access to organized markets by all relevant market participants and (2) assisting the Commission through the Technology Advisory Committee,[2] in fulfilling its mission statement, in particular, "…analyzing the application of new technologies in financial services and commodity markets, as well as by market professionals and market users, particularly in the areas of system capacities and readiness, order flow practices, and clearing and payment activities…"

1.2 Scope

Organized markets may operate in physical, automated or electronic venues. The Market Access Subcommittee has completed its review of market access issues germane to organized markets operating electronic venues. The subcommittee's recommendations and best practices for electronic venues, "*Best Practices for Organized Electronic Markets"* was submitted to the full Technology Advisory Committee for its review and consideration on November 27, 2001 as an Interim Report.[3] Relevant comments provided at and subsequent to that meeting have been addressed. At the meeting of the Technology Advisory Committee, the subcommittee was asked to increase the scope of its final report to also include recommend best practices for resolution of clearly erroneous trades occurring on electronic markets. The subcommittee has completed its work and submits its Final Report to the Technology Advisory Committee for its consideration and acceptance. Throughout the report, there are a number of recommended best practices, only some of which are highlighted in italics; many are not. A full understanding of the report will almost certainly require a full reading of the report, including its footnotes.

[1] The members and industry advisors of the Market Access Subcommittee are listed in Attachment II.
[2] The members of the CFTC's Technology Advisory Committee are listed in Attachment I.
[3] The subcommittee's Interim Report continues to be available on the CFTC's website.

2.0 Background

The costs of regulation and market access preferences, over time, should produce real economic benefit to public market participants in a proportion that is roughly equivalent to those associated public costs.

> "…regulation under which [domestic exchanges] operate should have clear benefits which outweigh the cost of that regulation."[4]

That is, the real economic costs of (1) public sector regulation; (2) private sector regulation (e.g., rules adopted by organized markets and self regulatory organizations); and (3) applications of technology, privileged market access and trade processing conventions adopted by organized markets should be balanced against a reasonable expectation of proportionate and concomitant public benefits (*presumptive responsibility*). In particular, the Market Access Subcommittee has been guided by (2) and (3) above.

> "To ascertain the net effect of a proposed policy change on social well - being, we must first have a way of measuring the gains to the gainers and the losses to the losers. Implicit in this statement is a central tenet of Benefit-Cost Analysis (BCA) : the effects of a policy change on society are no more or no less than the aggregate of the effects on the individuals who comprise society. Thus, if no individual would be made better off by a policy change, there are no benefits associated with it; nor are there costs if no one is made worse off. In other words, BCA counts no values other than those held by the individual members of society."[5]

2.1 Market Access Efficiencies

Dramatic changes and efficiencies in computing and communications technology can now make decision critical information available, real-time, in a format that can easily be exchanged with other parties, anywhere in the world. These advances make it both technically feasible and cost-effective for market participants to enter into transactions on electronic market venues that heretofore would otherwise have been too costly to undertake. Even the pure economics of inaugurating and maintaining newly organized markets have changed. In contrast to the more customary expenses of physical market venues, the new economics of modern organized markets are measured in kilobytes, nanoseconds and bandwidth.

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[4] House of Representatives, 106th Congress, First Session (August 5, 1999) (Remarks of James E. Newsome, Commissioner, CFTC, Subcommittee on Risk Management, Research, and Specialty Crops of the Committee on Agriculture).

[5] Portney, Paul R. "Benefit-Cost Analysis." The Fortune Encyclopedia of Economics. Compiled by David R. Henderson, Ph.D., New York: Warners Books, 1993

2.2 Privileged Market Access

Market participants with either superior market information or superior market access, over time, will have a considerable market advantage over those whose market information or market access is subordinate. In cases where subordinate market access is due entirely to client choice, e.g., telecommunications media or informational content, the subcommittee takes no issue. *Fair* does not, in every case, necessarily mean *equal in every regard*. Market participants and classes of market participants should be able to freely choose which unbundled market access services they wish to buy and those which they do not.

In physical market venues, clients must open accounts with futures commission merchants (FCMs); their orders must be filled by registered floor brokers, and the trade processing conventions of the physical environment ostensibly mandate trade intermediation at execution (floor members have the opportunity to execute their trades opposite the orders of customers). All (completely) electronic environments are very different. Mandated trade intermediation at execution has been largely replaced by the time/price paradigm.[6] There are no registered floor brokers in an all electronic market. Some new electronic markets have no FCMs or trade intermediaries at all.

Privileged market access refers to any rule, policy or processing convention of organized markets that discriminates among classes of market participants when providing any of their services, access to their services or access to market critical information. There are other market privileges more specific to market maker structures that are addressed in that section (Section 3.5) of this Final Report.

2.3 Market Structure

Virtually all theories that form the foundation of presumptive responsibility, public sector regulation and private sector rules and processing conventions have been originally based upon the model of organized markets operating in a physical venue. Worldwide, many organized markets are gravitating to all electronic, screen-based venues. Many organized markets, historically operating exclusively as physical venues are currently operating in a hybrid cusp of highly automated physical venues (defined as automated venues by the subcommittee). Some organized markets have implemented side-by-side combinations of electronic and automated venues. Others operate in an automated venue during regular trading hours and an electronic venue during non-traditional trading hours. Many newer organized markets, particularly those outside the U.S., are electronic and have never been otherwise. This migration from physical, to automated, to electronic venues is often

[6] An order from any class of market participant with the oldest time stamp, within a limit price, should be executed first. There are many other trade match algorithms. Some match proportionately against all opposite orders at the same limit price. Others give priority to a market participant that "turns" the market. Most importantly, these are all quantifiable economic criteria that can be automated without subjectivity and which do not, in and of themselves, provide a market advantage or other market preference to any market participant or class of market participant.

accompanied by a somewhat diminished presence[7] of trade processing intermediaries.[8] In those instances where this has been the case, there is also often a diminished level of presumptive responsibility for trade processing intermediaries to continue to assume.

It is not the intention of the subcommittee that the Final Report be meant to suggest that exchanges should adopt a particular market structure. It recognizes that, within the boundaries established by their regulatory obligations, exchanges are free to adopt the market structure which best meets the needs of their customers, reflects the commercial environment in which they operate and takes account of the characteristics of the products that they trade and the relevant underlying market.

2.4 Supervisory Oversight

> " … the first imperative when evaluating market regulation is to enunciate clearly the public policy objectives that government regulation would be intended to promote. What market characteristics do policymakers seek to encourage? Efficiency? Fair and open access? What phenomena do we wish to discourage or eliminate? Fraud, manipulation, or other unfair practices? Systemic instability? Without explicit answers to these questions, government regulation is unlikely to be effective. More likely, it will prove unnecessary, burdensome, and perhaps even contrary to what more careful consideration would reveal to be the underlying objectives."[9]

Regulations, rules, processing conventions and the application of technology (as they affect market access) should be fundamentally as different for physical, automated and electronic venues as the processes of those respective venues differ from each other.[10] While the means of accessing markets and the costs of such access have been dramatically reduced, the continued presence of privileged market access structures continues to involve a public cost. This public cost comes with a presumption that these privileged market access structures and mandated trade processing intermediaries are accompanied by a concomitant public benefit, most likely a high standard of performance.

Many of the provisions of the Commodity Exchange Act (as it applies to Designated Contract Markets) and the rules of organized markets were originally based on the presumption that exchanges would continue as physical trading venues and that order

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[7] Trade intermediaries may continue to have a significant presence in many organized markets operating electronic venues. This will be driven largely by client choice.

[8] Most notably the diminished presence of floor brokers and other individuals that handle orders.

[9] Remarks of Alan Greenspan, Chairman, Board of Governors of the Federal Reserve System at the Financial Markets Conference of the Federal Reserve Bank of Atlanta, Coral Gables, Florida, February 21, 1997.

[10] It is not the intention of the subcommittee to imply that organized markets operating electronic markets should necessarily be subject to a regulatory cost structure that is less than that for automated markets or for physical markets. That determination can only be made by the authority providing supervisory oversight.

transmission, execution and confirmation media would continue to be dominated by telephone and paper. The Commodity Futures Trading Commission Act (the "CFTC Act") enacted in 1974, substantially updated the Commodity Exchange Act (the "Act"). However, the context for that effort was an environment of "brick and mortar" marketplaces and high costs of accessing markets other than through "tiers" of market intermediaries. Trade intermediaries, segregation of client funds and other initiatives were present by virtue of regulations and/or organized markets' rules and processing conventions.

2.5 Structured Approach

The presumptive responsibilities of processing intermediaries that have been granted market access privileges, in any venue, should remain proportionate to the public costs of those market access privileges, particularly now, with the observable migration of markets from physical, to automated, to electronic venues. The continued application of private sector rules, structures and processing conventions that were developed and presumably justified in an environment where market access was not global in scope and often achievable at declining costs, may serve to inappropriately perpetuate privileged market access by market participants or classes of market participants as these organized markets continue to migrate from physical, to automated, to electronic venues.

Structure should be developed that would address and review the continued appropriateness of applying regulations, private sector rules, processing conventions and the application of technology (as it may affect market access) that were developed for physical venues to automated venues and electronic venues to ensure that (1) privileges of classes of market participants are not perpetuated solely by the phenomenon of migration of organized markets from one venue to the next; and (2) the privileges of classes of market participants in all venues should be re-justified by an analysis that weighs the public benefits against the public costs of such privileges. This analysis should include a discussion of the relevant public policy issues raised and must involve input both by organized markets whose venues provide such privileged access and by market participants whose market access would be deemed as subordinate.

3.0 Best Practice Recommendations

Some might believe that "best practices" should encompass all business methodologies that would meet or exceed some minimally acceptable threshold of appropriateness. Those responsible for providing supervisory oversight may or may not agree with that approach. Those organized markets to which best practices are meant to apply, might argue that they should have the broadest possible latitude to manage their own affairs, provided that their respective methodologies meet or exceed some minimally acceptable threshold of appropriateness. Still others argue that organized markets should be allowed to operate electronic markets below any minimally acceptable threshold of

appropriateness if they fully disclose all material facts regarding any potential remedialities.

The Market Access Subcommittee's approach to recommending best practices has been mostly guided by plain and simple English. Webster[11] defines *best* as "exceeding all others in excellence". The best practices recommended in this Final Report reflect the majority consensus of the subcommittee as being those practices that are the most excellent business practices among any number of possible practices that others might deem to meet or exceed some minimally acceptable threshold of appropriateness.

3.1 Bandwidth, Order Eligibility and Flickering Quotes

Order entry bandwidth is defined[12] as an organized market's end-to-end electronic processing capacity; from the receipt of orders from the client to the delivery of those orders to the venue of the order book. Bandwidth is not exclusively transmission (communications line) time. It is the amount of data that can be transmitted in a fixed amount of time.

3.1.1 Client Initiated Choice of Telecommunications Media

There are many relevant bandwidth factors with which the subcommittee takes no issue. The subcommittee recognizes that for many valid reasons all market participants' orders (sent at the same time) may not necessarily arrive at the venue of the order book at exactly the same time. The objective of this section is not to suggest what technology applications might be *best* but rather what business practices seem most *fair*.

End user market participants have widely different needs for both informational content and speed of transmission. Many organized markets operating electronic venues or the trade intermediaries involved in those markets appropriately provide market participants with a selection of telecommunications media from which they may choose. The public good is generally best served when market participants are offered a wide selection of unbundled services from which they can decide what they want to buy and what they do not.

Recommendation: An organized market operating an electronic venue should not intentionally limit market access by withholding its order entry bandwidth to a market participant or class of market participant.

[11] Webster's II New College Dictionary, p. 105.

[12] The most relevant technical definition of bandwidth is the amount of data that can be transmitted in a fixed amount of time. For digital devices, bandwidth is usually expressed in bits per second or bytes per second.

Market participants that value content highly and speed of transmission less so, may select an internet based communications solution. Market participants that value both speed and content may select a T1 line. Two points are relevant. All market participants that have selected the same category of connectivity should be treated equally[13] within that category. All market participants should have an equal opportunity to procure any category of connectivity generally available[14] to all other market participants. Other organized markets may provide a single method of connectivity to all market participants on grounds of security, efficiency or cost.

The subcommittee recognizes that data originating from more distant geographic points (across the same communications medium) will arrive a fraction of a second later than data originating at the exact same time from a less distant point. At some extreme point of automated trading, this phenomenon might begin to become problematic with some consistency, but instances of such are hard to find. In an ideal environment, organized markets operating electronic venues should periodically test their systems in an attempt to quantify this spatial phenomenon and at least make the results of its test(s) available to those market participants (as a group) that would most likely be adversely affected, so that they would at least know the time differential to which their orders are likely to be subject.

3.1.2 Order Entry Bandwidth

Organized markets provide a public benefit when both inbound and outbound information (data) can predictably be processed, unfettered by any data queues or any other interruptions. When unfettered access is available, market transparency can be optimized as the elapsed time between the moment that market participants express their opinions by entering their orders and the time that other market participants can observe and react to the expression of those opinions (whether as an unfilled bids or offers or as matched trades) the more valuable the information is to all involved, including those simply observing the process. This market transparency is also important (and provides a public benefit) to all market participants that are involved in either the underlying cash market or in any derivative products based on the underlying cash product.

Order entry bandwidth is also an issue of particular importance to the many market participants that have developed automated trading models that create computer generated orders in a small fraction of a second, based on near instantaneous market information received. Intuitively, the utility (and arguably the potential profitability) of such market participants' orders is a function of (1) the quality of their respective trading

[13] This includes cost. While the subcommittee recognizes that organized markets may implement complex quotation fee structures (on outbound data), it is the subcommittee's expectation that for inbound data, and for all market participants electing the same order entry telecommunications medium, there would be no price differentiation other than for throughput (especially large users of bandwidth) or in some cases, distance from the host.

[14] The reference is only to factors under the control of the organized market. An organized market operating an electronic venue cannot, for example, be held responsible for the paucity of T1 lines between Barrow, Alaska and Chicago.

models; and (2) the inbound and outbound bandwidth capacity[15] of the relevant organized market. Even for market participants that may not be deploying this degree of automation, robust bandwidth capacity, particularly for an organized market operating an electronic venue, is critical.

Recommendation: *An organized market operating an electronic venue should not ration the processing capabilities (bandwidth) of its automated order processing systems in any way that would intentionally create or maintain a market access preference[16] for any market participant or class of market participant.*

The subcommittee recognizes that incoming orders, subject to credit controls, will likely arrive at the venue of the order book later than comparable orders not subject to credit controls. Implementation of automated credit controls in electronic venues reflects good business practices by those that assume client risk and does not create a market access preference by discrimination. The subcommittee recognizes (for electronic markets that have trade intermediaries) that, currently, client level credit controls can only be practically implemented at the broker level. Nonetheless, the scope of this report must address organized markets with and without intermediaries. However, all orders that are subject to credit controls or similar types of filters should be processed in a uniform way that would not create or maintain a market access preference for any market participant or class of market participants.[17]

From a market participant's perspective, an organized market's order entry bandwidth likely includes everything between themselves and the market as it is reflected on the trading screen. This would include public networks. From the organized market's perspective, its entry bandwidth likely includes all proprietary systems and communications capacity and likely excludes all processing over which it has no control. Client choice is important and many market participants will elect to communicate with organized markets using public networks. Widespread usage of public networks in general, is accompanied by significant public benefits.

Recommendation: Organized markets operating electronic venues should maintain the operating capacity to operate their electronic markets (including order entry systems), even on particularly active market days, without noticeable and significant system processing degradation.

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[15] For emphasis, it is interesting to note that the quality of the trading model is entirely within their control and bandwidth capacity is entirely outside their control.

[16] This means providing any time, place, execution priority or informational advantages.

[17] Organized markets should not, in an attempt to circumvent this best practice, mandate that an entire class of market participants' orders be subjected to credit control processing (while all orders of a more privileged class of market participant would not), where there are no distinguishing differences (in credit quality) between the relevant classes of market participants. Doing so could only be deemed a tactic to intentionally provide preferential market access to one class of market participant by intentionally delaying the receipt of all others' orders (into the order book) and thereby creating a market access preference for that class whose orders were not subject to credit controls.

This is a high and costly standard and should be accompanied by some test of reasonableness. Intuitively, it would seem to be in the vested interest of the organized markets themselves to advertise their respective order entry bandwidth capacity in easily understandable terms.[18] Doing so would minimize any potential disconnect between the perceptions of market participants and the processing realities of the organized markets on which they are active.

The subcommittee recognizes, especially when trading options products in an electronic market venue, that computer (or other automated) generated bids and offers will need to be near continuously refreshed as the price of the underlying product (or volatility) change. This will necessarily consume large portions of the end-to-end processing bandwidth of the affected organized markets. The subcommittee also recognizes that temporary order queuing is most likely to occur when economic data or unexpected news affecting organized markets is announced. This is also when many market participants would argue that they are at most financial risk if undue queuing persists. As organized markets provide a public benefit by providing price transparency into their respective markets, bids and offers that are frequently refreshed provide a significant public benefit. The adequacy of organized markets' processing bandwidth should be periodically examined and reviewed for adequacy by organized markets' respective outside audit firms and by national authorities.

Recommendation: In an effort to ensure that organized markets operating electronic markets can maintain sufficient order entry bandwidth, they should consider recapturing their respective "bandwidth capacity" expenses by charging bandwidth usage fees to those market participants (without regard to class) that consume their processing bandwidth, proportionate to their respective usage[19,20] of such processing bandwidth.

[18] For example, "volume equivalent to four times the average will result in performance degradation of less than half a second". While "best" practices would likely be interpreted by many to mean that significant system degradation should not normally occur in market situations within four or five standard deviations, the best practice standard cannot be completely open ended. It is important to note that the perception of system degradation by market participants will also likely include degradation of communications media outside of the control of the relevant organized market. It is thus all the more important that organized markets make clear what their respective order entry bandwidth is, what it includes and what it does not.

[19] A sliding scale is specifically suggested. Market participants having the highest incidence of quotes to trades should expect to pay a disproportionately higher portion of bandwidth usage fees. Reference is made to the market maker section of this report in which it is suggested that organized markets should be encouraged to provide financial incentives to market makers rather than providing time, place, execution priority or informational advantages. Waiving all or a portion of bandwidth usage fees to market makers would constitute an appropriate financial incentive that might be offered, rather than providing privileged market access, including bandwidth priority.

[20] Intuitively, some minimum threshold should apply, otherwise every order ever received would be subject to the bandwidth tariff. The essence of the recommendation is that the disproportionate users are currently getting a free ride at the expense of all, and should either pay for their disproportionate usage or change their quotation injection methodology.

The subcommittee recognizes that maintaining and upgrading an organized market's (*electronic* venue) end-to-end processing bandwidth necessarily involves a significant and concomitant expense. *An organized electronic market which experiences no discernible order entry system degradation on remarkable market days but which recaptures the expense of maintaining a robust bandwidth capacity to avoid such degradation by charging bandwidth usage fees to those market participants (without regard to class) that disproportionately consume its processing bandwidth, is preferable to an organized electronic market that routinely experiences order queuing delays[21] but charges no such fees.*

3.1.3 Order Queuing Structures

The subcommittee recognizes that all organized electronic markets must have *some* capability to automatically[22] queue incoming orders to otherwise prevent the trade matching engine from becoming overwhelmed and from crashing. In all such cases, organized markets should (1) ensure that all market participants have easy access to the "rules of engagement" under which all such queuing algorithms operate; (2) attempt to implement the queuing structure as close as possible to the point of entry of the order (the furthest from the order book and the closest to the client); (3) use time[23] exclusively (FIFO) as the basis for releasing queued orders into the order book; and (4) design and test to ensure that no queuing algorithm could create a market access privilege for any market participant or class of market participant. Implementing the queuing process as close as possible to the client and making its current status transparent to all market participants puts more control into the hands of the client, ensuring that they are promptly informed of the approximate queuing time to which their orders are subject. The client could then better manage[24] its own order output stream, knowing the status of an organized market's order queuing structure.

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[21] Some would argue that an organized market should be permitted to provide (presumably) low cost services, including routine system performance degradation if it discloses its performance capabilities to all market participants. While this may be appropriate, it is not at all persuasive that doing so would constitute a *best* practice "equal to" or "better than" the subcommittee's recommended best practice.

[22] Organized markets utilizing queuing structures should display the current status of its queuing structure to all market participants (not just those with orders queued).

[23] It had been suggested that straight cancellation orders might have priority over all others. There was no meaningful support among the members of the subcommittee for this concept. An automated process of checking every single order in the queue to identify the cancellation orders would also slow down the release of *all* orders in the queue, all of the time.

[24] Allowing market participants to know (view) the prevailing order queuing delay time, might provide a significant public benefit. Knowing the degree to which a market's order entry system is experiencing performance degradation might cause highly automated market participants to throttle back their respective quotation refreshment frequencies. As virtually all such market participants are highly automated, it is not unlikely that, acting as a group, but for individualistic reasons, they might collectively throttle back their respective quotation refreshment frequencies, benefiting all market participants. These same active trading concerns might also appreciate the opportunity to enter certain straight cancel orders into the order book before the order entry system performance degraded further.

3.1.4 Order Eligibility

Recommendation: An organized market operating an electronic venue should not operate any order processing system, pass any rule or allow any order processing conventions that impose any restrictions (other than the presence of credit filters or automated incoming order queuing algorithms) that discriminate between the equal priority of (1) computer generated orders versus non-computer generated orders, (2) among types of orders or (3) among market participants or class of market participants.

This prohibition is universal. Applications of technology should not be used to create or to maintain privileged market access.

Recommendation: An organized market operating an electronic venue should not operate any order processing system, pass any rule or allow any order processing conventions that would otherwise preclude any market participant or class of market participant from entering simultaneous 2-way quotes.

Rules precluding market participants from entering 2-way quotes in electronic markets could be specifically designed to shield market makers from legitimate competitors. The legitimate quotes (including 2-way quotes) of highly automated market participants might provide all interested market participants with prices more competitive than the quoted prices of the designated market maker. One could argue that permitting all market participants to enter all types of orders freely, improves transparency and potentially improves the probability that market participants' orders might be matched opposite other market participant's orders.

3.1.5 Flickering Quotes

The subcommittee addressed several issues associated with the increased presence of flickering quotes within the context of the challenges of providing robust bandwidth in electronic market venues. Increased usage of Automated Price Injection Models ("APIMs") by market participants (ostensibly to improve one's queue position in the order book) has become problematic and exacerbates organized markets' efforts to provide reasonable bandwidth, both inbound and outbound. The consensus of the subcommittee is that flickering quotes are not necessarily bad; they are real quotes that are subject to immediate acceptance. However, *bandwidth congestion* as a side effect associated with flickering quotes is detrimental.

Bandwidth is not a free or inexpensive good. Electronic trading, including the increased usage of APIMs, consumes very large amounts of bandwidth, particularly in products with high volatility (where bids and offers are typically refreshed with high frequency). More generally, unless properly managed or incented, APIMs can generate an enormous amount of message traffic at prices often significantly outside the best bid and offer and

often lasting only for moments (hence *flickering quotes*), which contribute little to improve real market transparency or liquidity.

Organized markets periodically review the amount of bandwidth that they need to operate and the amount of host processing capacity that they require in order to run an efficient market that meets the needs of market participants. In doing so, they must balance the risk of purchasing excessive bandwidth and host capacity which would drive up their operating costs and presumably the costs passed on to market participants, against the risk of having inadequate bandwidth and processing capacity which would be manifested in poor levels of service and, unless addressed, loss of market participants to other exchanges, the Over-the Counter market or to ECNs.

Electronic markets often have complex trade matching algorithms designed to execute orders representing a combination[25] of trades or trades involving implied pricing. Flickering quotes not only consume order entry bandwidth capacity but, to the degree that a flickering quote might also be eligible as a component (leg) of a potential combination trade, they also consume the processing power of the trade match engine. In the long run, increase usage of APIMs may neither lead to narrower bid/offer spreads nor a meaningful increase in "at-the-money" liquidity.

There are significant public benefits associated with valid and robust price discovery. Flickering quotes may consume more bandwidth than they contribute to bona fide price transparency. Said another way, while not being illegal, flickering quotes often involve more public costs (by both congesting bandwidth and by actually being present in the order book for a seemingly infinitesimal instant) than they seem to provide public benefit.

Suboptimal order entry bandwidth has a detrimental effect on market transparency. If markets had free and open bandwidth, even with the machine gun quotes of APIMs, the market would be alert and able to deal with potential abuse. Best practice would be for organized markets operating electronic venues to provide sufficient order entry bandwidth so that, even during active markets, there would not be significant observable system performance degradation. In order to pay for such robust bandwidth, organized markets should charge fees for bandwidth usage.[26] However, all organized markets operating electronic venues, even those with the most robust order entry bandwidth, still need to have the capacity to queue orders at or prior to the order book gateway but to do so without discriminating among market participants or classes of market participants.

[25] For example, a calendar month spread differential would be a basic combination trade. Options trading based on implied volatility provides an excellent example of implied price processing that consumes CPU capacity whether quotes flicker or not.

[26] It makes no sense to charge every market participant that ever enters an order. Organized markets already have fee structures that apply to executed trades. Significant users of order entry bandwidth should pay reasonable fees to cover their respective significant bandwidth usage.

3.2 Block Trading, and Internalization of Order Flow[27]

3.2.1 Background

Financial futures gained significant acceptance as legitimate financial tools in the late 1970's. Increased acceptance from institutional clients brought to the forefront, disparities in the large order execution customs and practices of the underlying cash markets and futures markets. Institutional traders with singularly large orders to execute sought certainty of execution (getting the entire trade successfully executed), preferably all at one price. Futures markets then were not entirely accommodative to these kinds of orders; futures traders insisted that their bids and offers were subject only to immediate acceptance. Liquidity (size) that was thought to be present (and at what levels) in the trading pits often retreated to safer levels once it became obvious that a floor broker was handling a particularly large order. FCMs, as agents, insisted (for fairness) that a large order should be executed against all relevant resting orders.

The execution of such large institutional orders, of necessity, requires the immediate presence of counterparties with commensurate risk capital. When trading pits could not effectively assimilate such large orders, price gaps occurred, often resulting in unnecessary and unhealthy volatility. More than occasionally frustrated, institutional traders sought alternative methods and alternative markets. Working together, interested parties tried countless alternatives.[28] The emergence of exchanges in other countries, the trading of economically equivalent products subject to different regulatory regimes and the growth of the Over-the-Counter derivatives market provided accommodative techniques for negotiating large orders. Compromise and consensus were brought to bear, allowing domestic organized markets to develop plausible execution techniques for large orders. In general, "block trading" techniques involve execution accommodations generally permitting very large orders to be executed at a single price. The most liberal accommodations (not necessarily in the U.S.) also permit the entire trade to be executed opposite a single counterparty, and have the trade registered with the relevant clearing organization, and assimilated into the open interest.

From a public policy perspective, block trading is, on net, beneficial. It can be argued that it is somewhat imprudent to permit trading in a product that has particularly wide swings in trading volume if some accommodation for block trades is not made. Providing an appropriate structure (that assimilates the subcommittee's best practice) to accommodate block trading on organized markets operating electronic venues should

[27] The best practices recommended in this section are intended to apply only to reasonably mature products (or individual contract months or options series) listed for trading on organized electronic markets. More specifically, the best recommended practices assume that, for a given product, there is (1) a single successful organized market, (there may be more than one market, but one market clearly dominates); (2) that market is perceived to be the primary source of price discovery for the majority of relevant commercial market participants; (3) the liquidity in that product would, at a minimum, be described as reasonably sufficient, i.e. it would not be described as a nascent product by most commercial market participants; and (4) the market venue is electronic.

[28] Today's block trading conventions were preceded by Exchange of Physicals for Futures, Large Order Executions, Sunshine Trading, All or Nothing trades and countless other initiatives.

create the potential to attract some not insignificant portion of privately negotiated contracts, agreements and transactions that would otherwise be executed away from organized markets, back onto organized markets. By doing so, these large transactions would improve price transparency, add to liquidity,[29] provide revenues, become assimilated into the audit trail, become subject to private sector rules and public sector regulations and quite likely benefit from all of the advantages routinely associated with the clearing process. Therefore, block trading of large orders on organized markets operating electronic venues is to be encouraged.

3.2.2 Approach

The subcommittee's recommended best practice is, of necessity, complex. It suggests a bifurcated procedure that that provides appropriately different techniques for (1) unusually large and potentially disruptive orders; and (2) an *optional*[30] technique for orders that are unmistakably remarkable in quantity. The former is referred to as the subcommittee's *core* recommendation; the latter as the *optional* recommendation. The *optional* recommendation is only available for extremely large block trades and provides that they may optionally be internalized off the trading screen, but still must be reported in no less than 90 seconds. The optional recommendation is only meant to be available to an organized electronic market that has implemented the core block trading recommendation.

3.2.3 Core Best Practice

The entire remainder of this section constitutes the subcommittee's recommend core best practice for block trading and internalization of order flow.

3.2.3.1 Minimum Eligible Quantity

Orders eligible to be block traded must be of an appropriate minimum quantity. The minimum permissible quantity for executing block trades on electronic market venues will change as liquidity in that product/market changes from time to time. In general, the minimum quantity should be large enough that it represents a marked departure from the size of otherwise large orders that can be readily observed as being executed in that electronic product/market. For an order to be eligible to be block traded, it need not be *remarkable* in size, but its size should be substantial enough that it would otherwise move the market substantially and that by directing that order to the market (otherwise without a facility for block trading), a commercial market participant would have every

[29] Enhanced liquidity, better price transparency and being meaningfully assimilated into the audit trail would only actually occur if the organized market adopted the subcommittee's core recommendation.

[30] The optional best practice for orders that are unmistakably remarkable in quantity is meant only to be available to organized electronic markets that have adopted the recommended core best practice for block trades.

expectation that the order would (1) be temporarily and unnecessarily disruptive to the market; and (2) likely be executed at an average price that would reasonably be deemed to be *uncommercial*, relative to the underlying cash market for that derivative product or with respect to the market prices of correlative products at that time. Periodically, organized electronic markets should back test their respective minimum eligible block trade quantities for reasonableness by checking the actual percentages (by product) of total trades that were executed as block trades. Trends should be analyzed to ensure that their respective market is not simply turning into a block trading market, where block trades are not *exceptional* at all.

When determining whether a block trade satisfies the relevant minimum permissible block trade quantity and when following the subcommittee's core best practice, the determination is made *before* the recommended process starts. In the alternative, market participants can a*lways* attempt to benefit, themselves, from any price improvement that the market might provide. There are risks and rewards associated with this alternate strategy. If attempting to benefit, themselves, from any potential price improvement, market participants would enter a limit order expecting to take out all disclosed and undisclosed resting orders, not knowing the quantities of the resting undisclosed orders. In doing so, the unfilled residual quantity (to be internalized) might then be less than the minimum permissible block trade quantity, and would not be eligible as a block trade. Said another way, simply entering a limit order intentionally, through several bid (or offer) levels would not, in and of itself, start the block trading process (if the market participant is attempting to benefit from any potential price improvement) and hence does not become the point at which one determines if the block trade quantity would satisfy the minimum amount.

3.2.3.2 Preference for Disclosed Orders in the Order Book

An FCM taking the opposite side of a block trade should be obligated to take out all disclosed resting bids and take the remainder of the orders at the block price as principal. Under virtually all (block trade) circumstances, the potential practice of allowing block orders to take out resting displayed orders at their respective limit prices would always serve to the detriment of those affected market participants (when compared to the subcommittee’s recommended core best practice), rendering their resting orders as veritable "market road kill" by block trades which were never even displayed in the order book. Market participants should receive incentives for leaving resting orders in the order book and not be penalized.

The subcommittee’s approach distinguishes between displayed and undisplayed resting orders and rewards the former for their valuable contribution to enhance the price transparency of the relevant market venue. The subcommittee's recommended core best practice (resting displayed bids get filled at the lower "block" price) provides a financial incentive to all market participants to enter orders into the order book. In return, not only would they not potentially be "run over" by a block trade, but they would also have some significant possibility of receiving price improvement at trade execution.

It was noted that (in the example developed by the subcommittee) the block seller would have access to the same information in the order book that every other market participant would have. It is reasonable to assume that any experienced block trader (in our example) knows that his/her order is going to take the market down to significantly lower levels. The certainty of getting the entire order filled at a not unreasonable average price is of paramount importance; otherwise the block seller's request of an FCM for a block trade quote would not have received serious consideration in the first place.

A potential block seller *always* has two options:

1. Block seller attempts to benefit from any potential price improvement.

Give the FCM a limit sell order to take out (as agent) the resting bids (disclosed and undisclosed) at their respective prices[31] (any potential price improvement would be for the account and risk of the block seller) and expect to request that the FCM internalize the unfilled residual quantity at the limit price (and run the risk that the unfilled quantity might not then meet the minimum block trade quantity). The disclosed resting bids would be executed at their limit price and thus, the FCM would, consistent with its agency obligations, obtain price improvement for its customer's trade. As the quantities of any resting *undisclosed* orders are unknown, the unfilled residual quantity may be less than the minimum permissible block trade amount. Should this be the case, the (would be) block seller could only utilize any *on-screen* execution strategies otherwise customarily available (on that venue and for that product), but the unfilled residual quantity could *not* be internalized at any price, and no block trade would be reported. If the unfilled residual amount satisfies the minimum block trade amount, that residual amount would be internalized by the FCM at the limit price and would be promptly reported (the quantity reported would be the unfilled residual quantity).

2. (Recommended) Gives any potential price improvement to the displayed orders.

The block seller would approach the FCM and request a limit price for the entire block trade for a quantity certain.[32] The FCM would enter an appropriate combination of orders to take out the resting *disclosed* orders at the limit (block) price, providing any potential price improvement to the resting disclosed orders in the order book. No *undisclosed* orders would be involved. The amount of the quantity otherwise unfilled at the limit price would be internalized[33] by the FCM as a block trade regardless of the (residual) amount, as the determination of whether the block trade quantity satisfied the

[31] It is entirely conceivable that some electronic venues' policies could include the stipulation that market orders also take out undisclosed reserves. The subcommittee provides no recommendations regarding the public policy implications of permitting undisclosed reserves.

[32] The block trade quantity either would or would not satisfy the minimum block trade quantity for that product. The determination of whether the contemplated block trade quantity satisfies the minimum permissible block trade quantity is not be subject to any subsequent event.

[33] Under most market conditions, the FCM would be able to accurately estimate this residual quantity before agreeing to internalize it.

block trade minimum was made when the market participant first approached the FCM. The block trade would be promptly reported as the entire block trade quantity.

3.2.3.3 Undisplayed Resting Orders (reserves) in the Order Book

Undisplayed reserves should not be granted equivalent priority to displayed orders when participating in an execution of a block trade. Orders eligible for preferred priority should be those orders that, as a group, were visible (price and actual quantity) in the order book. A market venue that provides market participants visibility into a robust order book provides significant public benefit. While undisplayed reserves may contribute to the liquidity of an organized market venue, by definition, they contribute virtually nothing to enhance transparency of the order book. The time priority of undisclosed reserves being refreshed after the block trade has been completed is addressed in the detailed example.

Detailed Example

The subcommittee agreed that the best way to summarize its recommended best practice for block trading was to do so with an example that would address all of the issues that the subcommittee deemed relevant to recommending a best practice. The reference example that was used by the subcommittee focuses attention on the relevant issues and is included immediately below.

The venue for the subcommittee's example is a monopoly market; that is, there are really no other electronic (venue) markets that operate during substantially the same time zones for a fungible product and that are considered by a significant proportion of commercial market participants to constitute a bona fide source of price transparency. The prevailing market is xx.24 bid and xx.25 offered. The market is typical; there are bids in the order book below the xx.24 bid and offers above the xx.25 offer. Aggregate resting size in the book expands the further the bids and offers rest below and above the prevailing market price. All market participants that have trading terminals can see the order book five prices up and down.

A market participant having this information[34] indicated to its FCM that it wanted to execute a block sell order having notional value of $5 million.[35] Further assume that this market venue permits market participants to enter undisclosed reserves[36] into the order book. Prior to executing the block order, the order book looks like the following:

[34] It is not relevant whether the market participant could see the order book on its own trading terminal or whether its carrying broker provided this price/quantity information.

[35] Assume that a $5 million single order otherwise exceeds any minimum order size for a block order for that product/venue.

[36] The subcommittee provides no opinion with respect to the potential public costs and benefits of permitting market participants to enter undisclosed reserves into the order book of an organized market operating an electric venue. The members of the subcommittee believed that the example needed the robustness of undisclosed reserve balances in order to communicate the subcommittee's premise that trade matching algorithms should give the highest time/price priority to orders that provide price discovery and

Order Book

xx.29 {not relevant to this example}
xx.28 {not relevant to this example}
xx.27 {not relevant to this example}
xx.26 aggregate offers (4) of $34,000 [undisclosed aggregate reserves (3) of $66,000]
xx.25 aggregate offers (3) of $23,000 [undisclosed aggregate reserves (2) of $50,000]
xx.24 aggregate bids (2) of $43,000 [undisclosed aggregate reserves (1) of $50,000]
xx.23 aggregate bids (3) of $65,000 [undisclosed aggregate reserves (2) of $150,000]
xx.22 aggregate bids (5) of $111,000 [undisclosed aggregate reserves (3) of $250,000]
xx.21 aggregate bids (7) of $167,000 [undisclosed aggregate reserves (4) of $400,000]
xx.20 aggregate bids (9) of $222,000 [undisclosed aggregate reserves (6) of $550,000]
xx.19 aggregate bids (4) of $300,000 [undisclosed aggregate reserves (2) of $500,000][37]

The FCM indicates that it would be prepared to execute a block trade for all[38] $5 million at xx.20.

The subcommittee's recommended best practice would require the following steps:

1. The $43,000 bids (2) at xx.24 get filled at xx.20.[39]
2. The $65,000 bids (3) at xx.23 get filled at xx.20.
3. The $111,000 bids (5) at xx.22 get filled at xx.20.
4. The $167,000 bids (7) at xx.21 get filled at xx.20.
5. The $222,000 bids (9) at xx.20 get filled at xx.20.
6. The $4,392,000 gets block traded (internalized) with the FCM at xx.20.
7. Trades 1 through 5 would occur on the screen and would be instantly transparent to all market participants that have trading terminals.[40] It would not, at that time, be apparent whether someone simply "turned" the market with a large order or whether a block trade was involved.[41]
8. As soon as practicable, but in any event, not less than 90 seconds later, the FCM must submit the block trade to the market venue for retransmission (without any delay) through its trade reporting system. At a minimum, the transmission should contain at least four elements; the product description,

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transparency. Undisclosed reserve balances provide none, and therefore should be subordinate to disclosed bids and offers when block trades are being executed.

[37] Technically, the xx.19 bids would not have been displayed when the market was xx.24 bid / xx.25 offered as our mythical venue displays bids and offers 5 prices up and down.

[38] In our example, however, the actual quantity of the FCM's block trade (the residual) is $4,392,000.

[39] The concept of having limit orders benefit from price improvement is not new. Many electronic markets already have single price opening algorithms that do exactly that.

[40] Even for market participants that might otherwise only have rudimentary quotation devices (rather than trading terminals) the executions opposite the resting bids at xx.24, xx.23, xx.22, xx.21 and xx.20 would be displayed in rapid succession, providing reasonable transparency that some form of large sell order was just executed.

[41] If the venue had a policy of allowing market and limit orders to take out undisclosed reserve balances, (in this example) those market participants that had undisclosed reserve balances to buy (at relevant prices) would likely have the first opportunity to realize that the market went through the limit price of their hidden reserve balances. That being so, those market participants could logically deduce that the order that took out the resting displayed bids but not the undisclosed reserve balances must have been a block trade.

(month/series, strike, etc.), the quantity of $4,392,000, the price of xx.20 and the approximate time that the trade was executed.[42,43] The market venue should promptly disseminate the block trade information over its quotation system.

3.2.3.4 Time Priority for Undisclosed Reserves

Assume that after this phenomenon is observed on the screen, the market begins to regroup at xx.19 bid and xx.20 offered. The following procedures constitute the subcommittee's best practice for handling the undisclosed reserve balances that were associated with the various bids at xx.24 through xx.20.

1. If the bidder at xx.24 that had an undisclosed reserve of $50,000 wishes to enter a fully disclosed bid for that quantity ($50,000) or any lesser amount at xx.19, its time/price priority should be subordinate only to the (4) prior resting disclosed bids for an aggregate amount of $300,000.
2. If the bidder at xx.24 that had an undisclosed reserve of $50,000 wishes to transport its undisclosed bid for that quantity or any lesser amount at xx.19, the time/price priority for its undisclosed reserve balance should be subordinate only to the (4) prior resting disclosed bids for an aggregate amount of $300,000 and the (2) resting undisclosed reserve balances that aggregate $500,000.
3. All other undisclosed reserve balances at xx.23, xx.22, and xx.21 should, as groups have new time/price priority in descending limit price order[44] and within limit price, should maintain whatever time/price priority (relative to each other) they had prior to the execution of the block trade.

3.2.4 Optional Best Practice for Orders of Unmistakably Remarkable Quantity

3.2.4.1 Minimum Eligible Quantity

Orders eligible to be block traded under the subcommittee's recommended optional best practice must be of an appropriate minimum quantity. The minimum permissible

[42] From the subcommittee's perspective, the time at which the (9) resting bids at xx.20 were taken out would arguably be the proper start time to report the residual of the block trade. The residual trade should be reported to the exchange as soon as practicable and in no event later than 90 seconds later.

[43] If the market venue typically reports opposite clearing firm information on matched trades then the FCM executing the block buy trade would receive matched trade confirmation from the order book that it was both the buying and selling FCM. If FCM identity information is not otherwise distributed to uninvolved third parties (anyone else with a trading terminal) on all other matched trades, it should not be disclosed for block trades. That is, the provision (or not) of opposite FCM information should be no different for block trades than for any other matched trades.

[44] Conversely, a block buy order would give priority to the lowest offers firstly.

quantity for executing jumbo[45] block trades on electronic market venues using the optional best practice will change as liquidity in that product/market changes from time to time. In general, the minimum quantity should be unmistakably remarkable in quantity to the degree that it represents a marked departure from the minimum quantity eligible for block trades under the subcommittee's core best practice and *should be several multiples thereof.*

Periodically, organized electronic markets should back test their respective jumbo block trade minimum eligible quantities for reasonableness, by checking the actual percentages (by product) of total trades that were executed as jumbo block trades. Trends should be analyzed to ensure that their respective market is not simply turning into jumbo block trading market, where such trades are not *exceptional* at all. Given the subcommittee's particularly defining criteria for an appropriate minimum eligible quantity for the core best practice, it would be expected that jumbo block trades under the subcommittee's recommended optional best practice should comprise a modest fraction of trades block traded under the subcommittee's recommended core best practice.[46]

3.2.4.2 Procedure

The procedure for internalizing a jumbo block trade is without complication. The trade is completely internalized between the client and FCM. The organized market still must be notified of the trade as soon as practicable and in any event, no less than 90 seconds after all of the terms of the trade have been finalized. Neither party to the jumbo block trade may enter any trades directly related to the jumbo block trade (in the relevant product) until the organized market disseminates the particulars of the jumbo block trade across its quotation system. Such dissemination of a jumbo block trade across its quotation system serves as notification to the market place that the terms of the trade are final and the trade has been accepted into the open interest.

The parties may, at all times, act as agent in the product in the interim and may execute a directly related trade in a correlated product, but not the product (any month [if a futures] or option series [if an option]) in which the jumbo block trade took place. The parties internalizing the trade may begin to shift risk (by entering an order into the relevant product days in advance), but run a risk in doing so that the other party will not finalize all terms and complete the trade. Such anticipatory trades would have been appropriately executed on the screen, providing all market participants the opportunity to trade against them and with full transparency.

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[45] Alternatively, whatever term of art the industry elects to use to describe block trades internalized as provided by the subcommittee's optional best practice.

[46] However, it is at least theoretically possible that for a given derivative product that likely has a unique underlying cash market, the number of contracts and transactions in these "jumbo" block trades might exceed or even be a multiple of the number of contracts and transactions in non-jumbo block trades (as provided in the core best practice) *even if the recommended criteria for determining the minimum eligible quantity for the core best practice were followed.*

The FCM internalizing the trade must provide the organized market with the specifics of price, quantity, and time. The organized market should promptly report the trade (product description [month/series, strike, etc.], price, quantity and time) with obvious notations that it was a jumbo block trade. Organized markets wishing to implement this optional best practice must take reasonable actions to make market participants aware that their resting orders will not participate opposite jumbo block trades.

At issue are fundamental issues of fairness. Resting orders in the order book are very likely the primary price discovery source for block traders and FCMs prepared to internalize block trades. The (displayed) resting orders of market participants are continuously at risk of immediate acceptance and provide virtually all of the fuel for the price discovery process. While they provide this significant public benefit, most market participants will have no opportunity to participate opposite a jumbo block trade and may potentially be adversely affected after the terms of a jumbo block trade are disseminated. Market participants look to, and organized markets tout levels of open interest as the second best indicator of market liquidity. For the vast majority of market participants that will never participate in block trades, the presence of block trades in the open interest is thus considerably misleading. These market participants may or may not potentially benefit from having jumbo block trades present in the open interest. Jumbo block trades as liquidating trades could cause the open interest to decline in gaps. On any given day, the decline in open interest could exceed the volume of trading that actually took place on the screen.

Some would argue that absent a jumbo block trade best practice, this business would not be executed on organized electronic markets at all. If this were indeed so, the recommended best practice for jumbo block trades would not necessarily cause market participants to be losing something that they have now. By requiring that (1) jumbo block trades must be promptly reported; and (2) trades directly related to the block trade not be entered into the primary market until they *are* reported, market participants' displayed orders should likely receive some consideration proportionate to their considerable liquidity and transparency value. The issue is not at all about providing some protection to displayed orders; it *is* about providing guidelines for fair and reasonable access to organized electronic markets while accommodating business needs of large market participants that have easy access to Over-the-Counter markets.

3.2.5 Prompt Trade Reporting

The FCM internalizing a block trade or a jumbo block trade has the affirmative responsibility to report the trade (product description [month/series, strike, etc.], price, quantity and time) but no information respecting the identity of the client as soon as practicable, and in no event, later than 90 seconds after all of the terms of the trade are finalized.[47] The subcommittee is unanimous on this point. The subcommittee makes no

[47] The subcommittee is aware that the current practices of firms that routinely internalize order flow are reasonably disparate. Therefore, some standardization for the reporting of block trades will likely be required for all affected firms to comply with the 90 second requirement. A survey of current procedures

recommendation respecting acceptable media over which the FCM should report the block trade; that would be specified by the relevant organized market. All organized markets should achieve and maintain the highest level of price transparency to its market participants, upon whose order flow the market venue is completely dependent.

3.2.6 Multiple Market Venues for Economically Equivalent Products

Healthy competition among organized markets[48] serves the public good. Where multiple market venues concurrently serve as bona fide price discovery centers, FCMs may have some affirmative responsibility to use their best efforts to direct a customer's orders[49] to the market venue that provides the most favorable terms for the execution of that customer's order (i.e., cost, liquidity, price, speed of execution, etc.). Any responsibility in this area would lie with the FCM, not the organized market operating an electronic marketplace. In the U.S. futures industry, the absence of both a unified quotation system and a central limit order book make it all but impossible for all FCMs to pragmatically adhere to a meaningful best execution practice for fungible products offered on multiple venues. Some FCMs may elect to develop proprietary systems to monitor and route orders to the venue deemed to be in the best interest of the client. It is the consensus of the subcommittee that an automated block trading best practice for fungible products operating across multiple electronic trading venues would be extraordinarily difficult to achieve, absent either mandatory or privately negotiated linkages of market centers.

3.3 Transparency

3.3.1 Pre-trade Execution

Electronic markets function efficiently when market participants have the opportunity to use transparent market information to make trading and investment decisions, enter orders to do so, and achieve predictable results.

Recommendation: *Organized markets operating electronic venues should uniformly display their respective order books for all products to all market participants without any preference to any market participant or class of market participant.*

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among affected firms would seem appropriate. Approval of counterparty credit exposure should not be an issue as the trade, by definition, will be cleared.

[48] The subcommittee notes that widely disparate comments have been made respecting the issue of the probable economic barrier(s) to inaugurate an organized electronic market. The subcommittee provides no opinion on whether the current economic barriers to inaugurate an organized electronic market seem high or low, other than to note that organized markets, as a group, tend to describe these economic barriers to entry as being low, and end-user market participants describe these economic barriers to entry as being high enough that viable alternatives to entrenched electronic markets are not realistic. Intuitively, both positions cannot concurrently be correct.

[49] Specifically, orders not otherwise directed by the client for venue specific execution.

For a given product, an organized market should not disseminate its entire order book to one class of market participant but disseminate only a fraction of its order book to other market participants. If only a portion[50] of the order book is displayed, that portion should be disseminated uniformly, and be made available to all classes of market participants without discrimination. Informational content and timeliness of transmission should not be discriminatory among classes of market participants.

Client choice of informational content is paramount. Organized markets do not have to disseminate the entire order book to market participants that have elected, by their selection of informational content, not to receive it. If an organized market has different offerings of (order book) informational content, it simply must make all offerings available to all classes of market participants.

3.3.2 Post-trade Execution

One of the great public benefits of all organized markets, including organized markets operating electronic venues, is the dissemination of market prices. Organized markets focus attention centrally. All market participants that have an economic interest in a particular product/venue can express their market view and the *composite* of all of those views determines a product's instantaneous fair market value. All interested market participants should have equal access to this valuable information.

Recommendation: *Organized markets operating electronic venues should not disseminate price or price and quantity information with any preference to any market participant or class of market participant. Neither the timeliness of dissemination nor informational content may differ among market participants or classes of market participants willing to pay the same fees to receive the same information at the same time.*

The subcommittee does not take issue with the practice of some organized markets that sell their real-time quotation data for a premium price and a delayed quotation feed at a lesser price, nor the practice of charging different fees to provide quotation services to different classes of market participants. The subcommittee would, however, take issue if an organized market[51] were to decline to provide appropriate quotation data, content and transmission speed, *at all,* to a market participant or class of market participant (that were otherwise willing to pay appropriate fees to subscribe to such quotation service). This

[50] For example, five strikes or futures ticks up and down.

[51] It is not the intention of the subcommittee to imply that outbound market quotations are in all cases the exclusive property of the relevant organized market, although there is some case law in the U.S. that suggests that this may be the case for futures exchanges. On other select market venues, a cogent argument might be made that certain market data (most notably, transparency into the order book) are the property of a select subgroup of specialized market participants. The subcommittee intentionally provides no opinion on this issue other than to note that disagreement on this issue may be present for some market venues. The applicability of the subcommittee's recommendations does not turn on the ownership of the relevant data and should apply to whomsoever is the rightful owner of the data.

would be particularly problematic (and would raise significant public policy issues) if the organized market in question were also perceived to be the primary source of price discovery for the majority of relevant commercial market participants.

3.4 Error Resolution

Similar to the Block Trading section (3.2) the format and detailed contents of this section do not readily provide a meaningful opportunity to highlight (in italics) certain best practice recommendations. Other than the *Background* section (below) the entire remainder of this major section comprises the subcommittee's recommended best practices for resolution of clearly erroneous trades.

3.4.1 Background

Order entry media for electronic markets are very different than those for most physical market venues. Automated trading models interact with near real time quotation streams and generate orders in fractions of a second without any human intervention. Once an order is transmitted towards the order book, it is rarely, if ever, subject to human review. Orders involving human intervention have as their point of origin either (1) a computer keyboard; (2) a computer mouse; or (3) computer-based voice recognition technology. Many orders are computer generated and involve no human intervention or interaction.

Speed of execution varies with the trading venue, with electronic venues typically seen as being the most expedient. This expediency though, is achieved largely from the absence of human intervention. Veritably every person that touches an order in a physical trading hall, whether unwittingly or not, makes a value judgement about the *reasonableness* of that order at that moment in time. So while physical and automated venues provide many opportunities to test for reasonableness, these venues also provide environments where human imperfections can *cause* errors. Human error will always be present to some degree in any organized market, whether electronically operated or otherwise.

Errors in electronic markets often not only have direct repercussions but also can have extraordinarily significant indirect repercussions. Efficient market transparency media may display errant quotes and errant trades in fractions of seconds. To the degree that market participants active in electronic markets have automated trading systems, those systems may have already reacted to an errant trade (as an outbound trade quote) before the party making the error even realizes that they have made such an error. Because errors often have a ripple effect that may spill over into other products and other markets, determining the *span of influence* over which error resolution policies should appropriately be applied, becomes the most difficult of challenges.

3.4.2 Purpose statement

A best practice for resolution of clearly erroneous trades should strike a balance between the speed, efficiency, and certainty of execution demanded by market professionals and the responsibility of organized markets operating electronic venues to maintain market integrity and, to the degree possible, preclude erroneous quotes from being disseminated. It is unlikely that any organized market operating an electronic venue could effectively preclude the possibility of *all* incidences of clearly erroneous trades without unacceptably restricting the trading practices of its market participants. While organized markets should be provided appropriate flexibility to determine their respective policies for the resolution of clearly erroneous trades, those policies should produce results that are expedient, equitable, predictable and not based on the class of market participants involved.

3.4.3 Prevention (before the trade)

National authorities must ensure that organized markets operating electronic venues, (likely having national or international implications) have the immediate capacity to operate an electronic market place prudentially. Expertise of staff, financial health and systems redundancy are of paramount importance when granting approval to inaugurate emerging electronic markets.

Primary responsibility for performance on trades and resolution of clearly erroneous trades lies with the member or clearing member that is held directly responsible for the trade by the organized market or its clearing organization. Standards for such membership should include a formal determination that the firm has the immediate capacity to conduct its business in an all electronic environment, its systems have been adequately tested, its staff properly trained and its financial health appropriate when compared to its peers. Error resolution policies should not relieve market participants from their financial responsibilities or potential liability for making trades that are ultimately deemed to be "mistrades" if their actions caused financial loss to other parties.

Where organized electronic markets have trade intermediaries, it is important that those intermediaries structure their respective trading environments in a responsible and appropriate way, including the affirmative obligation to hire and train suitable and competent staff and to make appropriate risk management provisions. It is expected that trade intermediaries would have the capacity to establish and maintain quantity limits on clients having indirect[52] electronic access to markets.

Trade intermediaries and organized markets should, when and where appropriate, implement "are you sure?" alerts based upon the difference between the last trade price and the price entered in the order. Permissible price bands as error prevention tools are

[52] Indirect access is meant to mean that clients would have trading terminals, but their orders would be subject to credit control limitations managed by their trade intermediaries.

far more absolute, but similar in function, preventing trades with clearly erroneous prices to enter the order book at all. These alerts often catch transcription errors at the source, requiring no further action. Similarly (maximum) quantity limits provide a useful error detection mechanism, especially effective at precluding the juxtaposition of entering a price in the quantity field. Many organized markets have implemented both "are you sure?" alerts and permissible price bands at the product level. Where trade intermediaries have allowed clients to have indirect electronic access, implementation of client specific permissible price bands and maximum quantities should be encouraged.

The testing of automated trading models into *live* market environments should always be avoided. Market participants that would test systems against a live trading environment clearly have no intention of submitting any bona fide orders and provide neither liquidity nor market transparency. Yet market participants that have developed automated trading models, including APIMs, legitimately need the opportunity to thoroughly test their systems in a realistic electronic environment. The only plausible alternative is for organized markets to provide a test platform for market participants to utilize. This could be either a separate test platform operating during normal (electronic) trading hours or the primary operating platform, running scripted trades with both realistic prices and trade frequency that would be made available when the market is not open. National authorities providing supervisory oversight should ensure that organized markets operating electronic venues have made appropriate provisions to allow market participants to thoroughly test their trading systems.[53] This requirement grows increasingly important as utilization of automated trading models becomes more commonplace and trading models are near constantly modified and upgraded to incorporate improvements.

3.4.4 Transaction Resolution (after the trade)

It would appear that there are transaction resolution actions that need to be taken expediently and error remuneration actions that need not. The subcommittee suggests that organized markets bifurcate their error resolution procedures to reflect this, so that relevant issues are consistently addressed and resolved in the optimum order. Organized markets operating electronic venues should completely separate the processes of transaction resolution from the processes associated with fees, penalties and forfeiture. Market participants require that the former occur swiftly, predictably and likely not be market participant specific; the latter may likely involve deliberation, discretion and be market participant specific. Market participants must have complete confidence that the application of error resolution policies will not result in a capricious outcome.

Predictability and expediency are critical in determining whether or not to "bust" a trade. So called, "*No Bust*" collars are effective tools that provide both expediency and predictability to this process. Organized markets should make their *no bust* collars readily available either as pages on their electronic trading systems, their respective web

[53] There is some precedent in the larger financial services industry for providers to charge for access to testbed platforms, typically above some (free) level that would provide a positive incentive to test.

sites or both. Any changes to *no bust* collars should be appropriately publicized. Even when the determination has been made to bust a trade that may have involved a series of prices, only trades with prices outside of the *no bust* collar should be busted. Market participants with orders at or near the market (within the "no bust" collar) should have every expectation of good execution and should not become involved with a busted trade.

Completely automated markets will almost certainly have disseminated the specifics of a clearly erroneous trade over its quotation system even before the error is detected. Organized markets should promptly inform market participants (either by way of its quotation system or its trading system, the former being preferable) when the determination has been made to bust the trade. Notice of such action to bust the trade should contain the product description, (month/series, strike, etc.) quantity, price and approximate time that the trade was executed. The identity of the parties should not be revealed at this juncture. Organized markets should have the option but not the obligation to notify the market when there is the *potential* for a clearly erroneous trade to be busted, but before final determination to do so has been made.[54] During the determination period, organized markets should provide no information to interested parties that are not direct parties to a trade that may potentially be busted other than regulators. Market participants having an interest in the potential outcome (but are not direct parties to the trade) should not detract from the process by calling organized markets for information to which they are not entitled.

In order for transaction resolution to occur expediently, organized markets should establish clear maximum time limits within they must be notified of a request to bust a clearly erroneous trade. These time limits should be simple, well publicized and not product specific. Organized markets should have the option but not the obligation to consider a request to bust a clearly erroneous trade if the request is received after the maximum time limit has expired.[55] Under such circumstances, some consideration should be given to the circumstances of the counterparty.[56] It is noted that while several organized markets have well publicized time limits within which they must be notified by others of a clearly erroneous trade, they have made no similar representations respecting the time within which they, themselves, will predictably make an appropriate determination. It may be good business practice to do so, at least for trades promptly reported, and would likely bring a much needed sense of predictability to the process.

[54] Markets that might elect to notify market participants of the potential for breaking a trade (rather than after the actual determination to bust the trade has been made) should do so consistently, and their policy in this area should be clearly stated and readily available.

[55] Markets' policies in this area must be stated clearly, be readily available to market participants, and exercised in a manner fosters consistency and predictability.

[56] For example, one organized market gives the fee to the counterparty(s) for their inconvenience (and expense) if the trade is busted. This would appear to be a reasonable approach, particularly if the request to bust a trade was not received during the specified time limit.

When making transaction resolution decisions, organized markets should take actions that only affect their own immediate market place. Organized markets should have the option, but not the obligation of busting trades in their own, highly inter-related products (including options on those products) provided:

(1) the decision tree within which the organized market will determine whether or not it will bust clearly erroneous trades is well defined in advance and has been made easily available to market participants and;
(2) the inter-related product(s) that may be affected are well defined and that information has been made easily available to market participants well in advance and;
(3) over time, organized markets electing to exercise (or not to exercise this authority) should do so in a consistent manner that fosters a sense of predictability and;
(4) any trades busted would be outside of the "no bust" range(s) for those respective product(s) [all trades inside the no bust collars would stand] and;
(5) organized markets electing to retain this optional authority should vest such authority only with exceptionally experienced staff that understand markets well.

Knowing in advance, the likely breadth of remedial action that might be taken by organized markets would also bring an increased sense of predictability to the process. Conversely, if organized markets were to routinely permit busting trades in other products or in other related markets, trade intermediaries would likely begin to charge premiums to cover their potential increased liability to process orders in the relevant products.

When making a determination to bust a clearly erroneous trade, an organized market should never take into consideration the identity of the market participant or the trade intermediary unless one or the other (or both) habitually abuses the error resolution process. Anonymity should be preserved during the transaction resolution process. Loss of anonymity may become a component of the subsequent penalties and forfeiture process for habitual offenders, as a tool to provide an appropriate incentive for improvement, but counterparty identity should not be a consideration when determining whether or not to bust a trade.

Notwithstanding the aforementioned concerns for having organized markets establish a keen sense of predictability when determining whether or not to bust a trade, there still may be unique circumstances when such markets should exercise the discretion not to bust a trade that on its face, would appear to be a clearly erroneous trade. The classic example is an unsuccessful attempt to "turn" the market by entering a large offer through multiple levels of resting bids. If the market subsequently regroups at that lower level, the market participant realizes instantaneous open trade equity on all of the sales at higher prices. If the strategy fails and the market regroups to where it was before the attempt, the market participant cries "clearly erroneous error" and requests that the trades outside of the *no bust* collar be busted. There are undoubtedly other examples where some discretion should remain with the organized market. Such discretion can and should be used by organized markets in a manner that would only enhance, rather than undermine a much needed sense of predictability to the process.

3.4.5 Fees, Penalties and Forfeiture

After the organized market has made an expeditious and impartial decision to bust a trade, it must make a determination of what consideration (if any) should be awarded to the counterparty(s) to the busted trade and what further punitive measures would fit the circumstances. There is some evidence to suggest that establishing a flat fee or a fee based on quantity for simply requesting that a trade be busted, can be an effective tool to deter claims involving trades that would otherwise have little or no market impact. At least one organized market passes this fee through to the counterparty(s) to the trade for the inconvenience (and expense) of their involvement.

Errors of every kind and motivation tarnish the image of the organized markets on which they occur. At some extreme point, concern that legitimate trades might not stand, could actually precipitate an outright loss of business. Those that might attempt to improperly profit from the nuances of the system need to be otherwise deterred from doing so. Those that simply make an innocent mistake should still participate in the adverse economic consequences of their actions. Organized markets should establish, maintain and widely publish their respective guidelines for penalties and forfeiture related to clearly erroneous trades on their electronic markets and web sites.

Organized markets' penalties and forfeiture should be proportionate to the market mayhem caused, tempered by a determination (if at all possible) of intent. The recent (error) performance of market participants should be taken into consideration when assessing penalties and/or forfeiture. A sliding scale of increasing penalties and forfeiture for repeat offenders has been shown to provide an effective economic incentive to improve procedures and/or to hire more or more experienced personnel. There is some evidence to suggest that the threat of losing one's anonymity (should the relevant market participant again be involved in (cause) another clearly erroneous trade in the immediately foreseeable future) can cause remarkably recuperative performance.

In general, any basis for assessing fees, penalties and forfeiture should be well known in advance, be predictably applied, be proportionate to the market mayhem caused (or proportionate to the gravity of intentional acts that prove to be detrimental to the exchange), provide an economic disincentive for future poor performance and should not be based upon the class of market participant(s) involved. Organized markets should also retain the discretion to penalize market participants in situations where clearly erroneous trades are not necessarily broken.[57]

[57] Specific reference is made to the last paragraph of the *Transaction Resolution* section.

3.4.6 Training and Standardization

Individual staff of both market participants and organized markets should be identified as error resolution specialists. They must be adequately trained, particularly so for market participants that must deal with the currently disparate error resolution policies of a number of organized markets. Critical (error resolution specialist) contact information should be distributed widely to potentially interested parties by organized markets, trade intermediaries and market participants.[58]

Intuitively, as organized markets operating electronic venues continue to mature, particularly in the U.S., common business sense would suggest that some uniform best practice for the resolution of clearly erroneous trades would emerge as a standard. In a truly innovative industry, some trial and error may still likely provide the best way to arrive at an optimal standard. The further passage of time might also cause refinement to a standard after one has been established.

Forces of consolidation and globalization have the potential to positively affect the potential emergence of common best practices among organized markets operating electronic markets. With increasing frequency, many of the same major firms (or their affiliates) account for a significant proportion of the transactionalized volume of the world's organized markets. It behooves these large firms, trade associations, self-regulatory organizations and exchanges to proactively work towards homogenizing these error resolution practices into a best practices template. Simply said, this will otherwise occur naturally and later; with some coordinated effort, it could and should occur sooner.

Markets may independently establish disparate policies for resolution of clearly erroneous trades occurring on electronic venues. Confidence in US futures markets would likely decline if public customers were (respecting trades that were or were not busted on multiple venues) treated unequally or unfairly, particularly on undirected trades. The absence of both a unified quotation system and a central limit order book increases the probability that this might occur. If unable to reach a reasonably uniform approach among domestic organized electronic markets trading economically equivalent products, the CFTC should have the authority to interceded in an effort to, at a minimum, homogenize otherwise disparate error resolution policies. It is not clear that the CEA or the CFMA currently conveys this authority.

[58] If possible, phone numbers for error resolution personnel (critical contacts) should be generously distributed and easy to remember.

3.5 Market Makers[59]

3.5.1 Background

The subcommittee defines "market makers" as incented liquidity providers that are specifically contracted to operate under structures administered by organized markets operating electronic venues. Market makers are given financial consideration and/or granted market access privileges in return for maintaining some minimum market presence in a particular product.[60] Market makers provide significant public benefits by generating liquidity for nascent products. The market access preferences (often exclusive) granted to market makers most typically translate into a revenue stream that is roughly approximated by the quotient of the magnitude of the market access preferences granted multiplied by the magnitude of the order flow of market participants over which these advantages might be applied.

Market makers take an economic chance[61] that their early support (by their committed presence) of one nascent product (which, despite their effort might prove to be entirely unsuccessful) would preclude them from otherwise getting in on the ground floor on another product or simply trading a mature product in other than a market maker capacity. Other than any pure financial incentives that might be provided by the organized market, the real expense of maintaining a market maker structure falls entirely on the order flow of market participants active in that product.

It is generally agreed that in the very early stages of developing a product, market makers are often undervalued, i.e., they may provide greater public benefit than the profits that they can generate (at a public cost). As a product begins to mature, sustainable liquidity begins to develop naturally, and a single market venue begins to emerge as the victor, the

[59] The best practices recommended in this section are intended to apply only to reasonably mature products (or individual contract months or options series) listed for trading on organized electronic markets. More specifically, the best recommended practices assume that, for a given product, there is (1) a single successful organized market, (there may be more than one market, but one market clearly dominates); (2) that market is perceived to be the primary source of price discovery for the majority of relevant commercial market participants; (3) the liquidity in that product would, at a minimum, be described as reasonably sufficient, i.e. it would not be described as a nascent product by most commercial market participants; and (4) the market venue is electronic.

[60] The subcommittee recognizes that even in mature contracts, there may very well be specific contract months or options series (within a product) where the presence of a market maker would be beneficial. In many cases, the subcommittee's recommendations should be applied at the contract month or options series level, rather than the contract or product level. Some organized markets have rules that include criteria specifically meant to capture the essence of reasonable market liquidity for the purpose of determining when dual trading of certain contract months or option series should be permitted or not. It is not at all clear why similar criteria have not been developed and applied to market maker structures. The subcommittee specifically suggests this idea as a good starting point from which the concept might more easily be implemented.

[61] The opportunity cost of taking such a chance is diminished if the incentives granted to market makers are largely financial, as the subcommittee recommends.

public benefits and public costs of maintaining a market maker structure become roughly proportionate. It is only after sustainable market liquidity establishes itself more naturally through competitive forces that the subcommittee takes issue with the proportionality of the public benefits versus the public costs. For it is at precisely this starting point of measurement that the cumulative public benefits and cumulative public costs may disconnect in radical disproportion. In a truly mature product, the order flow may be many orders of magnitude greater than when the product was developing. The public costs (ostensibly a tariff on the order flow of market participants) of continuing to maintain a market maker structure in a mature product can be considerable. Conversely, as liquidity becomes more self-sustaining than not, the tangible public benefits often become questionable at best.

In many cases, market access privileges granted to market makers have been granted in perpetuity, allowing the current holder to actually sell the future rights to this public cost to another as a private asset. Selling such a franchise (a capitalized stream of anticipated future revenues [public costs]) rewards the holder of the private right for a future period of committed market maker service that they then never perform. Worse, it provides every economic incentive to the new holder of this private right to exploit their respective market access privileges to the fullest, extracting the maximum possible revenue stream off the order flow of market participants just to recapture his or her investment.

3.5.2 Business Models

Those that would attempt to economically justify granting market maker (market access) privileges in perpetuity attempt to ground their arguments on the venture capitalist model. Simply stated, in order to incent market makers to provide this function and commit their capital, they are entitled to a potential profit proportionate to the magnitude of the future order flow of the product. This argument collapses in several aspects. The first issue is one of potentially unwarranted or disproportionate enrichment. The true success of the relevant product may have little or nothing to do with the performance of the market maker at all (or the risks undertaken). Venture capital markets are swift to reward or penalize venture capitalists' real performance. Said another way, the product might just have been the better mousetrap that was launched at exactly the right time. Additionally, organized markets, having national implications, are not at all comparable to widget shops that can just spring up if venture capital is available. They are heavily regulated institutions only undertaken with some sense of gravity. If derivatives exchanges *were* actually funded with venture capital, it is far more likely that they would internalize all possible revenue streams. The *last* thing they would do would be to allow market access privileges to be privatized, to be bought and sold as the private assets of others. The most convincing argument against the appropriateness of the venture capitalist model turns on the issue of monopoly powers and the inherent ability to extract monopoly rents. Venture capitalists are never granted instant monopolies and are seldom if ever in a position to pass rules that shield them from competitors.

A far more appropriate (but still generously imperfect) business model that might better be applied to nascent products traded on organized markets would be that of granting patents.[62] In an effort to promote the general well being, patents are granted for unique products and services from pharmaceuticals to jet engines. By intentionally granting patents for finite periods, it is recognized that not only do risk takers need to be concomitantly rewarded for their ideas and performance, but that the associated public costs should not be open-ended. It is truly difficult to identify any other commercial market sector (other than a few privately held power utilities) where national authorities have approved (either by review or failure to review) the practice of permitting private sector monopoly powers to be granted in perpetuity. This practice, in those instances that are of real concern to the subcommittee, has the potential to provide a disconnect between the public benefits and public costs associated with public sector regulation and/or private sector rules. This disconnect runs completely contrary to the subcommittee's basic tenet of *presumptive responsibility*.

3.5.3 Tying

A potential practice that could also have adverse public policy implications relates to the manner in which organized markets might issue or assign specific market maker privileges and responsibilities. Just as certain forms of "tying" have been determined to be improper in banking,[63] this practice should be reviewed were it to be considered by organized markets inaugurating market maker structures. If a market maker or association of market makers were assigned to make markets in, for example, 15 products, two of which were reasonably mature (and arguably didn't require the continued presence of a market maker at all) and the remaining 13 were truly nascent products, then it would be reasonably likely that most of the public costs of sustaining the market maker structure would fall on the order flow of market participants involved in the two mature products, and most of the public benefits would be received by market participants involved in the 13 nascent products. The potential for this phenomenon would reflect a *disconnect* between the distribution of those incurring the public costs and those receiving the public benefits.

3.5.4 Approach

The determination of when organized markets should begin to consider dismantling market maker structures is indeed a difficult one. The factors involved in that determination would arguably be fewer and less complex for an organized market that has demutualized and where pure economic considerations and competitive factors would

[62] Patents are a public policy tool specifically designed to ensure that public costs of innovation *do not become open-ended*. This is a discussion of patents within the context of business models. It is *not* a discussion of patents within the context of organized electronic markets. The subcommittee makes no opinion about the appropriateness of applying business process patents to organized electronic markets.

[63] Christian A. Johnson, "Holding Credit Hostage for Underwriting Ransom": Rethinking Bank Antitying Rules, 64 University of Pittsburgh Law Review (Issue No. 1 2002).

almost certainly carry the day over entrenched private interests. There have been instances where the presence of a committed market maker was voluntarily or involuntarily terminated and order flow was lost. An organized market may wish to reintroduce a committed market maker for a particular product to defend it against a new competitive product introduced by another exchange.

The real difficulty of recommending best practices for market maker structures is that there is an "*appropriateness continuum*" of examples that can be observed only retrospectively, and that this report, by its very nature, must be written and presented at a single moment in time; while its recommended best practices must past the test of time. This appropriateness continuum runs from white to gray to black of examples that represent degrees of the balance *or imbalance* between (1) ensuring that talented market makers are rewarded for making markets and developing liquidity in nascent products when no one else seems willing to do so and before sustainable liquidity has otherwise developed, and (2) ensuring that there is never an egregious disconnect between the public benefits and the (seemingly open-ended) public costs associated with perpetuating market access preferences.

The subcommittee's issue at hand is persuading interested parties, that (1) whether currently or at some point in the future, there is the potential that the proportion of the cumulative public benefits and cumulative public costs associated with a market maker structure is unacceptably inappropriate (the black zone); and (2) that there may currently be observable instances of abuse within that zone. Precisely where gray stops and where black begins will change somewhat over time. It is the subcommittee's intent that by sharing the tenets and basic criteria that were used when developing best practices for market maker structures, future analyses of the equitability of market access might effectively be continued by others.

3.5.5 Competition and Client Choice

The subcommittee is unanimously of the opinion that bona fide competition among electronic venues (for products that are economic equivalents) will always ameliorate most concerns over market maker structures. Competition among organized markets usually comes with significant public benefits. However, when *all* organized markets trading economically equivalent mature products are similarly laden with the overhead of market maker structures, competition comes with significantly fewer public benefits than when at least one organized market provides market participants with a real selection of unbundled services from which they can determine which services they may wish to buy and which they may not.

The comment has been made that continued presence of market maker structures is an effective strategy for organized markets and entrenched market makers to keep competitive initiatives at bay. Bearing in mind the significant public costs of maintaining market maker structures in mature products, and the benefits of competition between

markets, it is not at all clear what proportionate public benefit would be provided by doing so.

Competition among all market participants creates public benefits. To the degree that a market maker begins to be exposed to legitimate competition from other non-market maker market participants, its continued presence and associated public costs should automatically cause the relevant organized market(s) to reassess the appropriateness of continuing the market maker program for that product.

3.5.6 Market Maker Incentives

Some organized markets currently provide incentives to market makers by providing financial incentives and/or time, place, informational or priority advantages, including superior speed of order trade transmission, reduced fees and guaranteeing the market maker some minimum portion of the order flow of market participants. In nascent products, where market maker structures continue to be appropriate, and/or where organized markets compete with each other with economically equivalent products, organized markets should have the flexibility to offer a broad range of incentives to market makers. The majority of subcommittee members, however, felt that financial incentives alone, should be sufficient under most circumstances.

Recommendation: An organized market operating an electronic venue should not, other than under unusually illiquid circumstances, provide privileged market access to market makers by violating the time/price paradigm within the order book. Under no circumstances should any class of market participant's orders be allowed to violate the time/price paradigm, other than orders of market makers.

It is suggested that fee or other monetary incentives[64] alone, should provide adequate incentive to attract sufficient liquidity provider(s) with far less public costs than violating the time/price paradigm. Said another way, all financial incentive alternatives should be exhausted before pursuing non-financial alternatives.

Recommendation: In all cases, organized markets should ensure that all market participants have ready access to a full description of the time, place, informational, or priority advantages that market makers have been granted, (by product or product type, should market maker advantages differ by product type).

[64] Reference is made to the recommendation on page 11 and Section 3.3, *Transparency*. Organized markets could offer reduced quotation fees to market makers, including a reduced fee structure for bandwidth usage. It is reasonable to assume that a market maker in an all-electronic venue would likely incur significant bandwidth usage fees. An organized market's ability to significantly reduce such bandwidth usage fees would appear to be a perfect opportunity to provide significant financial incentives.

Organized markets should be able (and encouraged) to privately negotiate the financial incentives and arrangements that it makes with its market makers. While the financial incentives are largely private contracts and are likely best kept that way, market maker responsibilities should be made available to the public.

To the degree that an organized market decides to grant market makers market access privileges beyond or in lieu of financial incentives, all market participants have a right to know the terms of those non-financial incentives. Market makers' market access preferences can directly affect the manner in which a non-market maker order might be executed. Some market participants may not care. Those that do, must have access to sufficient and relevant information on the time, place, informational or priority preferences granted to market makers so that they might draw their own conclusions about the potential impact that those market access preferences might have on the execution of their respective orders.

3.5.7 Public Policy Issues

Market maker structures provide a significant public benefit by maintaining some defined minimum level of market liquidity in nascent products (presumably when no one else is willing to do so) and often contribute to maintaining "orderly" markets. The public is not, however, well served when market maker structures are not dismantled well after sustainable market liquidity establishes itself naturally. There may be products or circumstances where market liquidity is particularly slow[65] to develop; therefore, some appropriate criterion of minimum market liquidity rather than the passage of time should determine an appropriate frequency with which the continued presence of market maker structures should be reviewed.

Recommendation: The continued presence and rationale of market maker structures (by product) should be reviewed with a frequency that automatically increases as sustainable market liquidity in the relevant product increases. The onus should be on the organized market to again justify the continued presence of privileged market maker structures based on economic and illiquidity factors.

Any appropriate analysis of market maker structures should reflect the same public policy issues that were addressed when the government established the regulatory structures that place limiting parameters on patents and copyrights. National authorities, pursuant to the oversight responsibilities delegated to them, should not permit marketmaking structures to degenerate into perpetuities, ostensibly levying a permanent parasitic tariff on the

[65] Scott Johnston's soon to be famous *pickle derivatives* example makes this point well. There may be products, e.g. pickles that have a concentration of commercial interest (either as buyers or producers). End user participation may be intermittent, cyclical or just slow to develop. In such cases, any reasonable analysis of the liquidity in pickle derivatives would conclude that the public good would likely be best served by continuing a market maker structure. This is consistent with the subcommittee's approach to market maker structures.

order flow of market participants. As liquidity develops with predictable consistency, market maker programs should be reevaluated to ensure that the public costs (market maker benefits) directly or indirectly through fee incentives incurred are appropriately proportionate to the public benefits received by investors when the market maker program was inaugurated.

Recommendation: *Market makers should be allowed to earn a not unreasonable, risk adjusted return for their services. A structure that requires market makers be "held" for no more than a "one lot" or some other veritably meaningless quantity should be allowed to earn a concomitantly de minimus risk adjusted return on capital.*

In attempting to address the public policy issues that are germane to market maker structures, the subcommittee looks to an appropriate *balance* between the relevant tradeoffs involved. Just as a market maker's return can become excessive when its market access privileges continue to be applied to the order flow of a mature product, a market maker's return can appear equally excessive if he or she is required only to assume some infinitesimal minimum market presence. The magnitude of private benefits is not in dispute. The net present value of the potential profits associated with the ability to maintain a time, place, informational or order priority advantage, non-competitively and in perpetuity, over the order flow of market participants is a very valuable (and arguably disproportionate) private benefit which comes entirely at the expense of the international investing public.

Recommendation: If market maker structures are not dismantled after sufficient liquidity develops, then the quantity for which a market maker is held should be consistently proportionate to an appropriate liquidity criterion[66] for as long as the market maker structure is then perpetuated.

First and foremost, the subcommittee is strongly of the opinion that market maker structures should be *dismantled* once sufficient liquidity develops within a series/product. Organized markets should have policies and procedures in place to recognize when market maker structures are no longer required. One way to provide an automated "liquidity reality check" on a market maker structure would be to increase the quantity for which the market maker is *held* in a manner such that it increases linearly as the liquidity in the product increases. It would eventually become obvious even to the market maker, that its services are likely no longer required. At some point (arguably a point well beyond the [market liquidity] point at which the majority of subcommittee members would have the relevant market maker structure dismantled), vintage market makers would likely abandon their market preferences anyway, rather than be held to a quantity three or four orders of magnitude greater than the quantities for which they were originally held when the market maker structure was inaugurated.

[66] Indicative criteria might be volume, average trade size, frequency of quotations (other than by the market maker) open interest, incidents of block trades, etc.

4.0 Competitiveness

Intuitively, the best practices among internationally relevant organized electronic markets should, over time, begin to reflect striking similarities. Arguably, best practices are simply detailed articulations of common business sense, tempered with an appropriate dose of equitability and fairness.

It has always been the expectation of the subcommittee that its recommended best practices would find their way to other international regulatory fora to be reviewed, debated and implemented. It is for this very reason that great care has been taken in drafting this Final Report, to make domestic references sparingly, and only when necessary for clarity.

In drafting the Final Report, the members and industry advisors of the subcommittee drew upon their approximately 170 years of collective experience in derivatives and global capital markets. Benefiting from such hindsight, the subcommittee recognizes that asymmetric and/or isolated implementation of *any* best practices may, under certain circumstances, have the unintended consequence of penalizing those organized markets that have implemented best practices in an effort to excel. Over time, organized markets that truly address the needs of all classes of market participants and strive to have the very best business practices should be rewarded with the order flow of market participants. It is equally incumbent on market participants to recognize that the implementation of best practices that may be designed to serve them well, may be accompanied by some added expense or inconvenience. Excellence does not just happen.

When addressing the subcommittee's recommended best practices, national authorities should continue to be cognizant of competitive issues and, to the degree possible, co-ordinate their actions in an effort to minimize any significant potential dislocations of business. It would be most unfortunate if organized markets striving to achieve excellence were rewarded for their efforts by losing their respective order flow to markets with lesser standards.

5.0 Further Analysis

While it is far from unanimous, there would appear to be an emerging consensus that organized markets operating physical venues and automated venues will likely migrate to electronic venues. Several things should be clarified: (1) many of those that have expressed such an opinion are not necessarily in a position to exert any influence over the process; (2) even among those that share this opinion, there are disparate opinions on how long such a migration might actually take; and (3) the subcommittee is simply noting the opinions of others and not itself, expressing any opinion on this issue. This issue is, however, quite relevant as the subcommittee's Interim Report, expressed the collective opinion of the subcommittee that its work should "…be allowed to continue, providing the time and resources to examine similar market access issues germane to automated market venues".

Undertaking this Final Report involved considerable resources. A professional review of technology related issues in automated venues would be an even greater undertaking. If organized markets operating automated venues are, indeed, likely to migrate to electronic venues, the subcommittee's best practices will be awaiting them. Should this migration be as inevitable as some would have us believe, not only would the subcommittee's recommendations (for automated venues) have a particularly short shelf life, but again attracting the caliber of talent to undertake such a review might prove difficult. Accordingly, the subcommittee retracts its interim recommendation to continue its work to study automated markets in favor of waiting for an appropriate period of time to monitor the potential rate of migration from automated to electronic venues to determine if undertaking a similar study of automated market venues would be appropriate.

6.0 Conclusion

The Market Access Subcommittee has completed its analysis of the public policy issues relating to applications of technology to electronic organized markets as such applications affect equitable market access, and submits its Final Report to the full Technology Advisory Committee for its review and acceptance. The Final Report addresses technology applications prior to trade execution, at trade match, information dissemination after trade match and error resolution. The subcommittee’s guiding principals were equity of market access, the considerable value of market transparency, reasonable parity among all classes of market participants and balancing the public costs of privileged market access against the expected public benefits.

The end product is a compilation of recommendations and best practices for organized markets operating electronic venues and support for those recommendations, grounded in public policy tenets. While it is understood that the instant relevance of the subcommittee’s Final Report is to the CFTC, specific references to the Commission have been intentionally minimized in this Final Report to maximize the potential transportability of these best practices to organized markets subject to the supervisory oversight of other national authorities.

The members of the subcommittee wish to join the chair in acknowledging the considerable contribution of our industry advisors, Blair Hull and Bill Miller, and thank them for sharing their insights and perspectives on these important issues.

Attachment I

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Attachment II

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William Miller
Independent Risk Oversight Officer, Commonfund Group, and
Chairman, End Users of Derivatives Council