

**Joint  
Canadian Securities Administrators  
Investment Industry Regulatory Organization of Canada**

**Consultation Paper 23-404  
Dark Pools, Dark Orders, and Other Developments in Market Structures in Canada**

**I. INTRODUCTION**

Over the past few years, the Canadian capital markets have experienced an evolution of market structure. Equity trading in Canada has moved from a centralized marketplace to an environment of multiple marketplaces, where exchanges and alternative trading systems (ATs) trade the same securities. Recent developments include the introduction of marketplaces that offer no pre-trade transparency (Dark Pools), the introduction of new order types, including those that have limited or no transparency (Dark Orders), the interaction of visible and Dark Orders on the same trading platform, and the introduction of smart order routers.

The Canadian Securities Administrators (CSA) and the Investment Industry Regulatory Organization of Canada (IIROC) (together, we) have considered and assessed each new development before implementation. However, many of these changes have been introduced by ATs and, while all changes are subject to regulatory review, they have not been subject to a public comment process.

New developments in market structure can impact retail and institutional investors as well as marketplaces and dealers. As organizations with an investor protection mandate, we must examine the position of all investors. It has become clear that there are different views on the potential impact of some recent developments. As a result, we have decided to solicit feedback to encourage discussion about some of these recent changes. We specifically request comment on the issues and questions raised in this consultation paper and encourage all participants in the market to participate in the discussion to ensure that all of the issues are explored.

This paper will discuss the evolution of the Canadian market (Part II), the characteristics of an efficient and effective market (Part III), specific issues for consideration (Part IV), and the conclusion and comment process (Part V). We have also included a glossary at the end of the paper.

We note that this paper will not address the following developments and issues: locked and crossed markets, trading fees, data fees, direct market access, high frequency trading, and proposed amendments to National Instrument 21-101 Marketplace Operation (NI 21-101), and National Instrument NI 23-101 Trading Rules (NI 23-101) (together, the ATs Rules) and the related companion policies published on October 17, 2008.<sup>1</sup> These issues are being considered in other contexts.

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<sup>1</sup> [http://www.osc.gov.on.ca/Regulation/OSCB/2008/oscb\\_3142\\_toc.jsp](http://www.osc.gov.on.ca/Regulation/OSCB/2008/oscb_3142_toc.jsp).

We also note that recently in the United States there has been discussion about the use of “flash orders” that show certain orders to a selected group of participants. On Thursday September 17, the Securities and Exchange Commission (SEC) unanimously proposed a rule amendment that would prohibit the practice of “flash orders” in the United States.<sup>2</sup> These “flash orders” would not be permitted in Canada because Part 7 of NI 21-101 requires a marketplace that displays orders to a person or company to provide such information to an information processor.

## **II. THE EVOLUTION OF THE CANADIAN MARKET**

### **1. A Centralized Market Structure**

Following the exchange restructuring in 1999 and before the introduction of ATSS, each equity security traded on a centralized exchange (for example, securities listed on the Toronto Stock Exchange (TSX) only traded on the TSX). Liquidity in Canada was located in either the transparent order book of the incumbent exchanges (TSX, TSX Venture Exchange) or the “upstairs market” where “block sized” orders are matched by participants and then executed on the exchange.<sup>3</sup> Traditionally, orders matched in the “upstairs” market were generally executed by the entry of a cross on an exchange and (provided certain conditions are met) were not subject to interference from other orders.<sup>4</sup> Although these trades are required to be executed on the exchange within the context of prevailing market conditions, many participants, including retail investors, are not able to execute against them except where (i) the current market price has to be moved to permit the “upstairs match” to be executed, or (ii) the marketplace provides “in-house client priority” where booked orders entered by the same dealer will interfere with the execution at the same price as the cross.

### **2. The Emergence of Multiple Marketplaces**

In 2001, the ATS Rules were introduced to provide a framework for the operation of ATSS and exchanges. Over the past few years, numerous ATSS have begun operating in Canada, creating a multiple marketplace environment that offers choice to market participants as to where to execute and post their orders. Some ATSS offer access to non-transparent pools of liquidity (MATCH Now,<sup>5</sup> Liquidnet<sup>6</sup>), while others offer transparent marketplaces (Pure Trading,<sup>7</sup> Omega ATS, Chi-X and Alpha ATS). Some facilitate trading via negotiation systems; others are call markets or auction markets.

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<sup>2</sup> The press release announcing the proposed rule amendment to prohibit “flash orders” can be found at: <http://www.sec.gov/news/press/2009/2009-201.htm>.

<sup>3</sup> Block trading (defined as 10,000 shares or more and \$100,000 or more) of large cap securities on all marketplaces has declined from 39% to 12% of the value of equity securities traded between January 2004 and March 2009. ITG Block Trading Report: Q1 2009 Update Figure 2.

<sup>4</sup> UMIR 2.1 *Just and Equitable Principles*, Policy 2.1 Part 2: Executing a Pre-arranged Trade or Intentional Cross.

<sup>5</sup> MATCH Now is an ATS where orders flow through the pool of available liquidity to see if there is a potential match on their way to a specified designated marketplace. If a match is possible, execution occurs and price improvement takes place. The active order executes at 80% of the National Best Bid/Offer (NBBO) improving its execution price by 20%.

<sup>6</sup> Liquidnet Canada is an ATS where indications of interest are communicated via electronic order management systems that allow trade negotiations to occur between buy side institutional investors.

<sup>7</sup> Pure Trading is a facility of CNSX Markets Inc. that trades securities listed on the Toronto Stock Exchange and TSX Venture Exchange.

### 3. The Emergence of Dark Pools

Dark Pools are marketplaces with no pre-trade transparency. Although the emergence of electronic Dark Pools is new to Canada, the existence of non-transparent pools of liquidity is not. The “upstairs market” existed as a non-transparent “matching” venue for listed securities. Transparency of these matched orders was provided only once they were executed on the exchange.

Dark Pools vary widely in structure. They may match orders on a continuous basis, during a call auction, or notify participants about possible matches thereby beginning a negotiation process. The first electronic Dark Pools were structured as crossing networks for executing large institutional sized block orders. Dark Pools now attract different types of liquidity from multiple participants including liquidity providers posting passive orders or responding to indications of interest (IOIs) sent from the Dark Pools, and agency orders that “flow through” the Dark Pools on their way to transparent auction markets. In Canada, two Dark Pools currently operate: MATCH Now and Liquidnet.<sup>8</sup>

Traders largely use Dark Pools to ensure anonymity and to minimize market impact costs. Other reasons for using them may include difficulty in executing large blocks on transparent markets (due to a lack of depth in the book), ensuring better control of an order, protecting proprietary trading information, the possibility of price improvement, and lower trading fees. Market impact costs occur when the execution of an order moves the price of that security above the target price for a buy order (or below the target price for a sell order). When information is leaked about a large order before it is executed, these costs can increase significantly. Dark Pools may decrease the opportunity for information leakage to occur by eliminating intermediaries that historically provided liquidity in the form of proprietary capital, or brought together buyers and sellers of securities on an agency basis.

Some Dark Pools allow small orders traditionally routed directly to transparent marketplaces to pass through their liquidity pool. This provides the small order an opportunity to execute against the hidden liquidity of the dark pool which may result in the small order receiving a better-priced fill than otherwise available on a transparent marketplace (presuming that the transparent marketplace does not also have fully-hidden liquidity). In all circumstances, the possibility of lowering market impact costs and finding better execution must be weighed against the potential opportunity cost of missing an execution on a transparent market.

### 4. Dark Orders

The emergence of multiple marketplaces in Canada has led to the introduction of several new orders, including dark order types, as marketplaces have attempted to innovate and distinguish themselves from one another. These dark order types may be fully-hidden or partially hidden.

A number of years ago, marketplaces introduced a reserve order that displays only a portion of its total volume at a price at which the participant is willing to trade (also known as an “iceberg order”). The non-displayed portion of an iceberg order can only execute at the posted transparent price. When the visible portion of the order is executed, an additional visible order is

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<sup>8</sup> A third dark pool, BlockBook, operated from August 2005 until February 2009.

automatically generated by the trading system of the marketplace drawing from the total size and decreasing the amount of the non-displayed portion.

Some of the new order types that have been introduced are variations on the iceberg order. One new order type, a discretionary-reserve order, enables the user to specify an alternative price, or range of prices where the non-displayed portion of an order can execute. Marketplaces have also introduced fully-hidden orders where neither the size nor the price of the order is displayed and can only be identified after an execution has occurred, when trade information is disseminated. In Canada, there is a minimum size requirement for hidden orders.<sup>9</sup> Out of the seven transparent marketplaces currently operating in Canada, six support iceberg orders, one supports a discretionary-reserve order, and one supports a fully-hidden order.<sup>10</sup>

By not displaying price and/or volume, these Dark Order types may minimize market impact costs by limiting the ability of other participants to identify and trade ahead of potentially large orders which are fully or partially hidden. We note that Dark Orders lose time priority in a marketplace's order book to visible orders at the same price. In the case of an iceberg or discretionary-reserve orders, each new visible order that is generated is treated as if it is a newly entered order and loses the time priority given to the original order.

## 5. Market Pegged Orders

Marketplaces have also introduced market pegged orders (also referred to as reference priced orders) that are priced and re-priced to a reference price such as the national best bid (offer) or a marketplace's best bid (offer). One type of market pegged order is the primary peg order. A primary peg order is a visible order that is automatically priced (and then subsequently re-priced as necessary) to equal either the best bid, in the case of a buy, or the best offer in the case of a sell.

Although this order type is relatively new to Canada, it has existed in the United States for over ten years.<sup>11</sup> The strategy which underpins market pegged orders has been used by traders in Canada for some time. Originally, dealers manually canceled and re-entered orders to revise stale quotes to match the best bid or offer so that they could participate in trades against incoming

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<sup>9</sup> UMIR 6.3 *Exposure of Client Orders* requires that an order for 50 trading units or less must be immediately entered on a transparent marketplace unless otherwise exempted. Permitted exemptions include:

- a) if the client has specified different instructions
- b) if the order is executed immediately at a better price
- c) if the order is returned for the terms of the order to be confirmed
- d) if the order is withheld pending confirmation that the order complies with applicable securities requirements
- e) if entering the order based on market conditions would not be in the interest of the client
- f) if the order has a value greater than \$100,000
- g) if the order is part of a trade to be made in accordance with Rule 6.4 by means other than entry on a marketplace,
- h) if the client has directed or consented that the order be entered on a marketplace as a Call Market Order, an Opening Order, a Special Terms Order, A Volume-Weighted Average Price Order, a Market-on-Close Order, a Basis Order or a Closing Price Order.

<sup>10</sup> A complete list of orders supported by each marketplace can be accessed on the following webpage: [http://www.iiroc.ca/English/Documents/SumCompEquityMarkets\\_en.pdf](http://www.iiroc.ca/English/Documents/SumCompEquityMarkets_en.pdf).

<sup>11</sup> See reference to Peg orders in NASD OATS publication as early as 1998. "NASD Rulemaking: Various Commissions Online. 6 March 1998 <<http://sec.gov/rules/sro/nd9756o.htm>.

marketable orders. The automation of this strategy occurred with the evolution of electronic trading, where algorithms react and adjust to changing conditions of the NBBO.

Marketplaces have introduced other types of market pegged orders. These include market pegged orders that are fully-hidden and market pegged orders that either peg to a price above or below the NBBO, or are eligible to execute at the mid-point of the NBBO. This paper will only examine the primary peg order.

## **6. Smart Order Routers**

The search for optimal execution in a multiple marketplace environment and the need for a tool to facilitate compliance with best execution and best price obligations, have led to the development of smart order routers used by dealers and marketplaces. A smart order router (SOR) is a technological tool that connects to multiple marketplaces, consolidates and analyzes order information from these marketplaces. The SOR then makes routing decisions seeking to obtain best execution and/or best price, or facilitate the execution of the strategy determined by the user.

Although the options available to a SOR in making routing decisions are limited only by the programming behind it, to date there have been two routing strategies used in Canada: serial (or iterative) routing, and parallel (or spray) routing. A serial SOR sends the entirety of an order to the marketplace with the best posted bid or offer. Whatever volume is not executed at this price is re-sent by the SOR as another complete order until the original order is filled. A parallel SOR makes order routing decisions by splitting up a single order into smaller orders and sending multiple orders to several marketplaces simultaneously. These small orders are not only sent to multiple marketplaces but also can be sent through several price levels on a single marketplace to interact with all displayed liquidity.

## **III. THE CHARACTERISTICS OF AN EFFICIENT AND EFFECTIVE MARKET**

Even though the ATS Rules have been in place since 2001, only recently have there been significant changes in market structure. In the view of the CSA and IIROC, any change to the Canadian market should be assessed by considering key characteristics and looking at the impact on the market. The characteristics of an efficient and effective market<sup>12</sup> which are relevant for the discussion in this paper include the concepts of liquidity, transparency, price discovery, fairness, and integrity.

### **1. Market Liquidity**

Liquidity can be defined as the market's capacity to absorb trades from customers' buy and sell orders at, or near, the last sale price of a particular stock. The greater the number of orders and shares available at a particular price, the more liquid the market will be. Some of the characteristics of liquidity are market depth, market breadth, and resiliency. Market depth refers to the number of orders at different prices that line the book. Market breadth is the number of shares that are wanted at a particular price level and the ability to absorb an incoming large

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<sup>12</sup> The TSE, in its 1997 Report of the Special Committee on Market Fragmentation: Responding to the Challenge identified a set of characteristics essential to an efficient market. These characteristics were later referred to by the CSA in the background paper entitled "Regulation of Alternative Trading Systems in Canada" published on July 2, 1999 with the initial proposal of the ATS Rules.

order. Resiliency is the ability for a market to attract offsetting orders relatively quickly when order imbalances occur.<sup>13</sup> An additional aspect that is important to assessing liquidity is the number of transactions executed on a marketplace.

## **2. Visibility/Transparency**

Transparency refers to the degree to which there is real-time dissemination of information about orders and trades to the public.<sup>14</sup> In Canada, pre-trade transparency is required when a marketplace displays orders of exchange-traded securities.<sup>15</sup> Post-trade transparency by a marketplace is always required. Order and trade information must be provided to an information processor or an information vendor if an information processor does not exist.<sup>16</sup> Currently in Canada, TSX Inc. is the information processor for equity securities.

## **3. Price Discovery**

Price discovery refers to the process through which the execution price for a trade is established. The discovery of a security's fair market value is derived from two sources: the supply of and demand for the security, which indicate a participant's willingness to transact at a given price, and information about transactions which have actually occurred.

If prices are not transparent to participants, or there is unequal or incomplete information, participants will not be able to make informed decisions. In addition, if participants are not given access to markets where a security trades, they may be discouraged from participating or trading in that security and a less efficient price discovery process may occur.

## **4. Fairness**

Fairness refers to the perception and the reality that all participants are subject to the same rules and conditions and that no one participant or group of participants has an unfair advantage or disadvantage. The "fairness" of a market may relate to fair access to a specific marketplace or the market as a whole, fair access to trading information, or the fair treatment of limit orders. For example, it may be perceived as unfair if all participants are not given access to a specific marketplace, or if information about orders or trades that occur on a marketplace cannot be seen by all participants. The perception of unfairness with respect to the treatment of limit orders has the potential to impact an investor's willingness to participate and contribute to the price discovery process in that market.

## **5. Integrity of the Market**

Integrity of the market is the level of general confidence investors and the general public have in the marketplace as a whole or in a particular marketplace. This confidence is closely associated with investors' perception of fairness.<sup>17</sup> The regulatory environment and the effectiveness of the

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<sup>13</sup> *Ibid.*, pp 17-18.

<sup>14</sup> Part 7 of NI 21-101 requires orders to be provided, and subsection 9.1(2) of 21-101CP requires a marketplace that displays orders to provide to an information processor all relevant information regarding orders and trades including details as to volume, symbol, price and time of the order or trade.

<sup>15</sup> No pre-trade transparency is required if order information is only displayed to a marketplace's employees or to persons or companies retained by the marketplace to assist in the operation of the marketplace (subsection 7.1(2) of NI 21-101).

<sup>16</sup> Part 7 of NI 21-101.

<sup>17</sup> TSE Report of the Special Committee on Market Fragmentation: Responding to the Challenge, p. 25.

regulation of that market and its participants also play a role in whether there is confidence in a market.

#### IV. SPECIFIC ISSUES FOR CONSIDERATION

##### 1. Dark Pools

The emergence of electronic Dark Pools has prompted regulators to examine issues surrounding the efficiency and effectiveness of the market. These issues include the lack of pre-trade transparency or visibility in the market, the possible impact on price discovery, the impact on fair access as the market share of Dark Pools grow, and the possibility of information leakage. Supporters of Dark Pools argue that any concerns are counterbalanced by increased liquidity brought to the market as a whole.

###### (i) *Transparency and Price Discovery*

The lack of pre-trade transparency provided by Dark Pools limits the availability of information regarding the market's breadth and depth. As a result, some are of the view that their existence threatens the effectiveness of the market's price discovery process. They also believe that this threat may be intensified as Dark Pools gain greater market share and fewer orders are displayed to all market participants, including those of the investor community.

An alternative view is that although Dark Pools do not provide pre-trade transparency, they do contribute to price discovery because information about executed transactions is disseminated publicly by all Dark Pools.<sup>18</sup> In addition, there may be increased order flow to the market when orders that previously may have been internalized<sup>19</sup> are now placed in a Dark Pool, and when market participants use the unique characteristics of Dark Pools to increase their trading volumes. These sources of increased liquidity in turn contribute to a more efficient market by reducing transaction costs.

Dark Pools have recently come under scrutiny in other jurisdictions because of their lack of transparency. In the United States, the SEC has expressed concern that the lack of post-trade transparency by Dark Pools makes it difficult if not impossible for the public to assess Dark Pool trading and to identify pools that are most active in particular stocks.<sup>20</sup> Such difficulties arise because although Dark Pool trades are published on the consolidated tape, one cannot identify on which market a trade took place because Dark Pool trades are marked as over-the-counter. In addition, trades are not required to be reported on a matched-only basis. As a result, volumes can be inflated when both the buy and sell side of a trade is reported as two separate trades ("double counting").

In Canada, similar issues do not exist. Under NI 21-101, each Dark Pool is required to provide to the information processor for equity securities trade information, including the total volume of the trade. The information processor, when disseminating the information is required to identify

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<sup>18</sup> Section 7.2 of NI 21-101 requires a marketplace to provide to an information processor accurate and timely information regarding trades for exchange-traded securities executed on the marketplace as required by the information processor. If there is no information processor, then the information must be sent to an information vendor.

<sup>19</sup> Internalization refers to the process where orders are matched before they are sent to an execution destination.

<sup>20</sup> Schapiro, Mary L., Address before the New York Financial Writers' Association Annual Awards Dinner, New York, N.Y., June 18, 2009.

the marketplace on which the trade took place. Such requirements make it possible to accurately monitor both the overall market share that Dark Pools capture and the market share of the originating marketplace where securities are traded.

(ii) *Liquidity*

One view is that Dark Pools increase liquidity through size discovery. Size discovery refers to a market's ability to identify and attract large orders which in turn increases its liquidity. According to this view, Dark Pools increase liquidity by offering the benefits of anonymity and minimized market impact to attract large orders from new and existing participants that may not have otherwise been exposed on a transparent market.

Others are of the view that because orders that are entered on Dark Pools still need to be executed whether Dark Pools exist or not, without Dark Pools, these orders would be forced to be executed more often on a transparent marketplace. This would give more participants the ability to interact with these orders and would lead to less market fragmentation. Market fragmentation in turn can lead to higher transaction costs for all market participants through larger bid-ask spreads and greater volatility.

However, it can also be argued that even without Dark Pools these large orders would not necessarily be matched in the transparent market, but in the upstairs market exclusively, as was the case before Dark Pools were created. This view may not be supported by the decrease in the percentage of block trades executed on the TSX. Block trades on the TSX as measured by value has decreased from 39% to 12% for large cap stocks, 41% to 24% for mid-cap stocks, and 29% to 10% for small cap stocks, from January 2004 to April 2009.<sup>21</sup>

As previously mentioned, the first Dark Pools originally facilitated the execution of large block trades that would significantly impact the market if traded on a visible marketplace. Today, Dark Pools not only offer facilities to seek out liquidity for large-sized orders, but also have become alternative trading venues used for all types of orders and many types of participants.<sup>22</sup> If Dark Pools do in fact attract new orders through size discovery, some propose that their use should be limited to orders with a minimum size requirement. This would facilitate size discovery while limiting market fragmentation.

Some do not agree that Dark Pool orders should be limited to a minimum size. They argue that Dark Pools offer multiple benefits to many different types of participants and should not be limited to those participants with only large orders. Small retail orders should be able to seek out potential price improvement by flowing orders through a Dark Pool on their way to a transparent marketplace. Institutional investors can use the features of both Dark Pools and visible marketplaces to obtain optimal execution for orders of different sizes. In addition, as the costs to trade in a Dark Pool may be lower than on a transparent marketplace, Dark Pools can also offer a source of cost savings to all their users.

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<sup>21</sup> *Supra.* footnote 2.

<sup>22</sup> For example, in June 2009, the average volume of a trade on all marketplaces was 792 shares, whereas the average trade volume on Dark Pools differed significantly. Liquidnet that has a market structure intended to facilitate large block shares averaged 69,752 shares per trade. MATCH Now, a Dark Pool offering the possibility of price improvement to orders that are sent to a visible marketplace, averaged 355 shares per trade.

(iii) *Fairness*

Some Dark Pools restrict access to a limited number of market participants (for example, buy-side institutional clients). Restricting access may be unfair if it does not allow all market participants the opportunity to trade against all orders and offers an advantage to certain participants. This aspect may be magnified as the market share of an ATS increases. Others are of the view that offering access to a specialized group of participants leads to better sourcing and matching of natural orders. In turn, this decreases the possibilities for front-running and creates better execution through lower costs, less market impact, and increased order flow.

Under certain circumstances, regulators have allowed marketplaces to limit access under certain conditions. In the United States, a marketplace must open access to all participants if it captures a market share of 5% in any security. In Canada, a marketplace cannot unreasonably prohibit, condition or limit access by a person or a company to services offered by it.<sup>23</sup> As Dark Pools continue to increase market share<sup>24</sup>, the question of the impact of Dark Pools restricting or conversely capturing certain market participants trading activity arises.

An additional characteristic of the Canadian market that may raise a concern about fairness is broker-preferencing or “seeking of the cross.” Although regulation in Canada ensures that better-priced orders are executed first (“price priority”), orders can execute ahead of orders posted at the same price but at an earlier time when both sides of the trade are entered with the same Participating Organization/Subscriber identifier. Some are of the view that this feature is unfair because it violates strict time priority and offers an unfair advantage to certain participants over others. They also suggest that this feature creates Dark Pools within a visible marketplace because certain pools of liquidity can be accessed first by only certain participants (employees and clients of the broker).

Others argue that without broker-preferencing, large dealers will find other ways to internalize their order flow. For example, they could create their own dark pools, as has happened in the United States. Such a development could significantly reduce liquidity in the visible markets and threaten the price discovery mechanism. This threat is particularly strong in Canada because of the high concentration of liquidity that is controlled by a small number of participants.

(iv) *Information Leakage*

The initial concept of the Dark Pool was a trading venue that provided absolutely no pre-trade transparency. A new trend has developed as some Dark Pools are disseminating information about their orders to attract order flow through the use of indications of interest (IOI).

IOIs sent by a marketplace seek out interest by informing other pools, routers or market participants that there is an order for a particular security in the system. The information broadcast is usually limited, and may include information regarding symbol, side, size or size range, or price. This raises a number of questions including:

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<sup>23</sup> Sections 5.1 and 6.13 of NI 21-101.

<sup>24</sup> Approximately 0.595% of the volume traded in Canada is on Dark Pools (IIROC Market Share by Marketplace for the four quarters ending June 30, 2009).

- whether marketplace participants entering orders on Dark Pools are aware of this practice, and whether they know what information is being disseminated about their orders, and
- at what point does an IOI provide enough information to be considered an “order” that would require pre-trade transparency under the ATS rules.<sup>25</sup>

The question of whether an IOI provides enough information to be considered an “order” is further complicated when IOIs sent by Dark Pools include information with implicit prices. For example, certain IOIs contain information that notifies the recipient of a firm willingness to execute at a benchmark price such as the national best bid (NBB), the national best offer (NBO) or the mid point of the NBBO. This raises issues whether an “indication of interest” with an implicit price communicates a firm willingness to buy or sell and should require the same treatment as an order.

Information about orders may create opportunities for “gaming”. An example of this is when a proprietary trading desk responds to IOIs with orders on both sides of the market in order to gather information about what side of the market an outstanding dark order is on. This in turn can lead to the leakage of information which can be used to exploit an order by traders positioning themselves ahead of the order.

IOIs sent from particular marketplaces can communicate information in addition to the specific information contained in an IOI. An IOI received from a dark pool that only permits large block orders or allows access to only large institutional clients can signal the existence of a block order or possible large institutional interest in a security.

In all circumstances where gaming and information leakage take place, the benefits of using Dark Pools can be reduced if the confidentiality of the dark pool user is compromised. As a result, some are of the view that the practice of Dark Pools sending IOIs should be prohibited or restricted.

The concerns raised by the practice of Dark Pools sending IOIs can be countered by the potential benefit that these communications can bring including greater success in the search for liquidity. Multiple marketplaces and multiple Dark Pools compete for order flow, and the ability of a marketplace to attract contra-side orders which can result in a trade is critical. Increased likelihood of information leakage and gaming can be offset by the ability to facilitate finding liquidity quickly and improving the execution obtained by the user, an ability which could become more important as the number of Dark Pools increase.

Another issue relating to IOIs arises when they are sent to only certain marketplaces or participants. Some are of the view that a marketplace or subscriber should have the ability to select destinations for IOIs on a preferential basis. Others are of the view that this information should be available to all market participants and that an unfair advantage is gained if only certain participants are provided with this information.

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<sup>25</sup> See Part 7 of NI 21-101 for pre-trade transparency requirements. Section 1.1 of NI 21-101 defines an order as a firm indication by a person or company, acting as either principal or agent, of a willingness to buy or sell a security.

**Questions relating to Dark Pools**

- Question 1:** While trading on Dark Pools has not been extensive in Canada, please provide your views on the actual and/or potential impact of Dark Pools on:
- a) Order size
  - b) Price discovery
  - c) Liquidity
  - d) Market fragmentation
  - e) Trading strategy
  - f) Client instructions
- In your view, what will be the potential impact if the market share of Dark Pools in Canada increases significantly?
- Question 2:** Please provide your views on whether there should be a minimum size requirement for orders entered on Dark Pools?
- Question 3:** Please provide your views on whether Dark Pools should be permitted to send IOIs? If so, what information should be permitted to be included?
- Question 4:** Please provide your views whether or not Dark Pools should be permitted to select which destinations are able to receive IOIs? In your view should the ability to select which destinations receive IOI's be offered to subscribers?
- Question 5:** In your view, when does an IOI provide sufficient information to require it to be treated like an order that should be subject to pre-trade transparency requirements?
- Question 6:** In your view what kind of transparency about the practice of sending IOIs should be made by Dark Pools to their subscribers?
- Question 7:** Should Dark Pools be required to provide full or partial transparency of their orders if a threshold of trading activity is reached?
- Question 8:** What are your views on the fairness of broker-preferencing?
- Question 9:** Are there other issues that should be considered in connection with Dark Pools?

**2. New Dark Order Types**

The launch of certain new Dark Order types on transparent marketplaces has raised concerns about their potential impact on price discovery, the fairness of the interaction with visible orders, and liquidity. Proponents of dark order types argue that they increase liquidity, make orders available to all marketplace participants that may otherwise have been held by a dealer and only available to interact with its internal flow, and can provide better execution than expected for

incoming orders. These benefits might offset any possible negative impact that dark order types have on the market.

There have been empirical studies that have looked at the impact of hidden orders/iceberg orders. In a study examining the effect of the TSX decision to abolish the use of hidden limit orders in 1996 and then reintroduce them in 2002, Anand and Weaver found that quoted depth did not change following either decision suggesting that the hidden portion of orders represents depth that would otherwise not be exposed. When iceberg orders were reintroduced, they found that total inside depth increases. For both events, volume did not change and the use of exposed limit orders did not change. In their view, this suggests that traders that are required to expose their orders will switch to using market orders instead of exiting the market.<sup>26</sup>

(i) *Transparency and Price Discovery*

Different types of Dark Orders make different contributions to price discovery. Trades resulting from the execution of any Dark Order<sup>27</sup> provide post-trade transparency and iceberg orders and discretionary-reserve orders also provide some pre-trade transparency with respect to the price of the order and part of the volume.

The iceberg order has been offered for a number of years by exchanges. However, variations of this order type recently introduced have raised some questions and concern. In the case of discretionary-reserve orders, the reserve portion of the order is given a discretionary price or price-range, which results in two prices for the order: one for the visible portion, and another for the reserve portion. Some are of the view that the pre-trade transparency provided by the visible portion of discretionary-reserve orders is misleading because it does not represent the true supply and demand for a security. Because the reserve portion of the order is often significantly larger than the visible portion, the displayed information of the order may give a false impression of the price that the participant is willing to pay. As a result, some say that these order types should be prohibited.

Others are of the view, however, that like Dark Pools, any negative impact of Dark Orders is offset by increased liquidity and trade executions resulting when orders that would otherwise have been matched in the “upstairs market” are executed on a visible market. When this occurs, the liquidity pool accessible to all participants is increased. They argue that the existence of hidden orders in transparent marketplaces provide an additional incentive to reduce spreads and for participants to show their “true” best price (to tighten the spread so that a hidden order may not execute in ahead of them). Reduced spreads, in turn, lower volatility and support price discovery.

(ii) *Liquidity*

Supporters of Dark Orders argue that institutional investors execute more of their large block orders on marketplaces where these order types are available. If this is true, then their existence not only offers the benefit of increased size discovery, but also increased liquidity and gives marketplace participants the opportunity to interact with orders that would never have been

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<sup>26</sup> Anand, A. and Weaver, G. (2004) “Can order exposure be mandated?” *Journal of Financial Markets*, 7, pp. 405-426.

<sup>27</sup> See Part 2 for descriptions of these order types.

available if they were matched in the “upstairs market.” Bringing orders onto a marketplace which would otherwise have matched in the “upstairs market” or on an electronic Dark Pool can increase the visible market’s liquidity. This increased liquidity can result in better executions for investors and lower transaction costs.

Others are of the view that this argument does not apply to fully-hidden orders as they tend to be small in size. As a result, fully-hidden orders may allow those trading small sized orders using Dark Orders to seek an advantage over visible limit orders by benefiting from the price discovery of a visible order without making an equal contribution. In Europe, the Markets in Financial Instruments Directive (MiFiD), permits an exception from pre-trade transparency requirements for hidden orders only if they meet a certain minimum volume threshold.<sup>28</sup> We note that there are three other exceptions which may allow smaller dark orders to be entered without pre-trade transparency requirements. As described above, in Canada, under UMIR 6.3 *Exposure of Client Orders*, client orders for 50 standard trading units or less must be immediately entered as a visible order on a transparent marketplace unless specific consent is provided by a client on a trade-by-trade basis, or another exception to the order exposure requirement applies.

(iii) *Fairness*

Recently, concerns have been raised that allowing the interaction of discretionary-reserve or fully-hidden orders with visible orders is unfair to visible, resting limit orders. While these transparent limit orders take on risk by establishing better best bids and offers, discretionary-reserve or fully-hidden orders are able to “free-ride” on their contribution and position themselves for execution ahead of the visible orders. Several scenarios have been highlighted to illustrate this point:

- In the case where the discretionary price for the reserve portion of a discretionary-reserve order is higher than its visible portion (for a buy order), execution may take place in front of the best visible posted bid. Some are of the view that this execution may take advantage of the visible order without making an equal contribution to price discovery. Such an effect may be magnified in the case where the visible portion of the order is posted well off the market. The reserve portion is able to execute against incoming orders that normally would have executed against the best visible posted bid, with almost no possibility of the visible portion of the discretionary-reserve order being executed.
- In the case of fully-hidden orders, execution may take place ahead of the best bid or offer anytime a spread is wider than the minimum price increment. Such instances provide no opportunity for the participant entering the visible order to respond and may contribute to the perception of unfair treatment of visible limit orders that establish the best bid or offer.

In addition, arguments have been made that because of the possible negative impact on the perception of fairness in the Canadian market, the existence of Dark Orders may discourage participants, retail and electronic liquidity providers (ELPs) alike, from posting visible limit orders which in turn may impact the liquidity of the Canadian market.

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<sup>28</sup> The definition of large scale orders are set out in Table 2 of Annex II of MiFiD.

Others are of the view that discretionary-reserve and fully-hidden orders exist and are traded in many markets around the world, including the United States and Europe. They submit that the fairness concern is minimized because visible orders are given time priority ahead of hidden or hidden portions of reserve or discretionary-reserve orders at the same price on the same marketplace. The opportunity for these orders to be executed before a visible order is counterbalanced by the possibility of missing a trade.

In Canada, there are a number of additional factors that may be relevant in deciding to use Dark Orders. First, IIROC has introduced a “bypass” marker whereby hidden liquidity can be bypassed in certain circumstances.<sup>29</sup> Second, it has been proposed that only visible orders will be protected under the CSA’s proposed trade-through protection requirements. Consequently, better-priced non-visible orders may be traded-through as inferior-priced visible orders are executed first.

### **Questions relating to Dark Orders**

**Question 10: Please comment on the actual and/or potential impact, if any, of Dark Orders on:**

- a) Price discovery**
- b) Liquidity**
- c) Clients’ execution instructions**
- d) Trading strategy?**

**Question 11: Please comment on the effect, if any, of the interaction of Dark Orders with visible limit orders on fairness and price discovery.**

**Question 12: Should there be a minimum size requirement for certain Dark Orders? If yes, please explain?**

**Question 13: Should a transparent marketplace allow fully-hidden orders to post at prices inside the prevailing spread (or should at least a portion of the order be required to be exposed thereby narrowing the spread)?**

**Question 14: Should marketplaces be required to provide priority to visible orders over Dark Orders at the same price?**

**Question 15: Are there other issues that should be considered in connection with Dark Orders?**

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<sup>29</sup> IIROC Market Integrity Notice No. 2008-008 *Provisions Respecting Off Marketplace Trades*.

### 3. Market Pegged Orders

Other types of orders that have been introduced by marketplaces are types of reference-priced orders (also referred to as market pegged orders).<sup>30</sup> Some have raised concerns with the introduction of one of these types of orders, the primary pegged order. It has been expressed<sup>31</sup> that these orders when offered by a marketplace are unfair, anti-competitive, and may negatively impact price discovery and the market as a whole. Others are of the view that primary pegged orders, when offered by a marketplace, increase market efficiency, liquidity and assists in obtaining best execution.

#### (i) *Price Discovery, Fairness and Liquidity*

Those opposed to primary pegged orders submit that these order types may “materially compromise the fundamental principles of price discovery and liquidity.”<sup>32</sup> They are of the view that primary pegged orders “free-ride” on the contribution of those that have posted visible limit orders and the execution of a primary pegged order ahead of the order establishing the best bid or offer is unfair. In their view, the limit order posted at the same price should execute first and if it doesn’t, the investor will not achieve the benefit of posting the limit order (i.e. execution or rebate credit). As a result, there may not be sufficient incentive to contribute liquidity to the market. In addition, there may be little incentive to contribute to the price discovery process by posting visible limit orders because those that disclose information about their order may not receive the benefit of being executed first. It is argued that to ensure that this disincentive does not occur, in the absence of some kind of time priority enforced across marketplaces (which would be impossible to implement because of differences in latency rates between marketplaces), these order types should not be permitted.

Those that support primary pegged orders submit that they contribute to price discovery in at least three ways:

- reduce mispricing risk,<sup>33</sup>
- contribute to a more accurate reflection of a security’s fair market value by contributing liquidity at particular price levels, and
- when primary pegged orders are executed, the trade information is displayed, thus contributing to the price discovery process.

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<sup>30</sup> Market pegged orders can be visible or hidden. In addition, the reference price that the order is pegged can vary from the NBB, the NBO, the mid point of the NBBO, or a percentage of the spread of the NBBO. The market pegged order that will be discussed in this paper will be the primary pegged order. It is a reference-priced order that is automatically priced, and subsequently re-priced as necessary, to equal either the reference bid, in the case of a buy, or the reference offer in the case of a sell.

<sup>31</sup> National Post Commentary “Pegged Orders: An Unfair Trade” by Jeffrey MacIntosh, January 12, 2009.

<sup>32</sup> *Ibid.*

<sup>33</sup> “Mispricing risk – a limit order may execute after an innovation in public valuation (e.g. a public news item) at a mispriced limit price, because limit-order traders generally are off the exchange and do not monitor market conditions continuously.” Brown, David P and Holden, Craig W. (2005) “Pegged Limit Orders”, Working Paper, University of Wisconsin.

In addition, supporters are of the view that the automatic re-pricing of primary pegged limit orders at the marketplace level mimics the updating currently done by algorithms at the dealer and client level.<sup>34</sup> The automation of primary pegged orders offered at the marketplace level, in addition to contributing to liquidity, also increases a market's efficiency by reducing the message traffic generated by the execution of this strategy at the dealer or client level. Message traffic has continued to grow at significant rates, and there are few indications that this growth will lessen. Recognizing this trend, the contribution made by primary pegged orders and other types of pegged orders in reducing message traffic may prove to be increasingly significant.

Finally, supporters of primary pegged orders submit that where there are competing marketplaces, there cannot and should not be time-priority between marketplaces. Regulation requires that a better-priced order be executed before an inferior-priced order (best price or trade-through obligations), but does not require visible orders at the same price to be executed based on which order was displayed first. Where there are multiple orders displayed on multiple venues at the same price, participants will, and should choose their execution venue based on best execution criteria including the execution fees of the marketplace, the performance of the market's trading system speed and functionality, and the reliability of the market.

#### **Questions relating to market pegged orders**

**Question 16: Please comment on the actual or potential impact if any, of market pegged orders on:**

- a) Price discovery**
- b) Fairness**

**Question 17: Although this paper has not specifically addressed pegged orders that execute at the mid point of the NBBO, in your view, should market pegged orders be allowed to execute at prices unavailable to transparent orders (e.g. at a price between the bid and the ask when the spread is a single trading increment)?<sup>35</sup>**

**Question 18: Although this paper has not specifically addressed pegged orders that are fully-hidden, in your view are there any issues that arise due to fully-hidden market pegged orders?**

**Question 19: Are there other issues that should be considered with regard to market pegged orders?**

#### **4. Smart Order Routers and Dark Liquidity**

As stated above, Canadian market participants (specifically, dealers, marketplaces and third party vendors), have been developing smart order routers in response to the introduction of multiple marketplaces and Dark Pools. Generally speaking, the discovery of dark liquidity by SORs on an otherwise transparent market is incidental. The SOR routes an order to a particular marketplace

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<sup>34</sup> National Post commentary, op.cit.

<sup>35</sup> See footnote 30 for a description of mid-point pegged order.

to execute against visible orders and may execute against an iceberg order or hidden order; however visible orders are executed first at a given price.

We have seen the evolution of SORs and their technology. There has also been the introduction of a SOR by a marketplace that takes into account hidden liquidity posted on that marketplace, whether as part of a reserve or discretionary-reserve order or a fully-hidden order, when making routing decisions.

Having knowledge about hidden liquidity posted on a marketplace has several potential benefits:

- better executions for the active order using the SOR that executes against dark liquidity, and
- decreased instances of crossed markets.

Some argue that it is a competitive advantage that should be used to the benefit of the marketplace's participants and the marketplace.

However, concerns have been raised that having access to this information is unfair because:

- the information is not provided to any other router or market participant, and
- it may lead to the predetermined execution of Dark Orders ahead of visible orders at the same price.

In addition, the disincentives to posting hidden liquidity brought by the use of the bypass marker that enable the order to avoid interacting with hidden orders and the lack of protection that hidden liquidity will receive under the proposed order protection rule may be undermined by a marketplace's use of hidden liquidity when making routing decisions.

Concerns are also raised about whether participants that enter the hidden liquidity know that their information is being "leaked". Finally, it is possible that this information, when provided to an SOR, is being "displayed" under Part 7 of the ATS Rules and should attract the pre-trade transparency requirements.

A related issue with regard to the fairness of an SOR taking into account hidden liquidity posted on a marketplace is the practice of databasing order flow. Databasing is where an SOR keeps a record of orders that are sent through it and uses this information in subsequent routing decisions. This strategy allows market participants' using a databasing SOR to identify and execute against Dark Orders which are opaque to other market participants. This may raise a question of fairness between market participants who use SORs with databasing technology and those who do not.

**Questions relating to SORs**

**Question 20:** What is your view of a marketplace SOR taking into consideration hidden liquidity posted on that marketplace when making routing decisions? Is it appropriate? Should the information be required to be provided to other participants? Should a marketplace's SOR be allowed to take into account hidden liquidity only after all visible liquidity at the same price on all marketplaces is executed against?

**Question 21:** Is the practice of a SOR taking into account hidden liquidity posted on a marketplace an example of internalization of order flow? What are the similarities and differences with a dealer internalizing order flow?

**Question 22:** What are your views on internalization generally?

**Question 23:** What is your view on "databasing"?

**Question 24:** Please comment on whether there are there other issues that should be considered in connection to SOR's using hidden liquidity in routing decisions?

**Other questions**

**Question 25:** Are there any other issues not discussed in this paper that should be considered for discussion at the roundtable that will be convened after the publication of this paper?

**Question 26:** In what way if any, do you believe that the combined potential impact of these developments represents risk to the market?

**V. Conclusion and Comment Process**

Recent market structure developments regarding Dark Pools, new order types (including Dark Orders) and other current issues have raised a number of issues. As a result, we would like to solicit feedback on the issues set out in this paper. We invite all interested parties to make written submissions. Submissions received by December 29, 2009 will be considered.

Because of the importance of the issues raised in this paper and their impact on the Canadian capital market, the CSA and IIROC intend to convene a roundtable to discuss the issues and the submissions received. The discussion will inform possible future work on process and substantive requirements by both the CSA and IIROC.

If you are interested in participating in the roundtable, please convey your intention in your comment letter provided to the addresses below.

You should send submissions to all of the CSA and to IIROC.

Submissions to the CSA should be addressed in care of the OSC, in duplicate, as indicated below:

Alberta Securities Commission  
British Columbia Securities Commission  
Manitoba Securities Commission  
Autorité des marchés financiers  
New Brunswick Securities Commission  
Superintendent of Securities, Newfoundland and Labrador  
Registrar of Securities, Department of Justice, Northwest Territories  
Nova Scotia Securities Commission  
Registrar of Securities, Legal Registries Division, Department of Justice, Nunavut  
Ontario Securities Commission  
Registrar of Securities, Prince Edward Island  
Saskatchewan Financial Services Commission  
Registrar of Securities, Government of Yukon Territory

c/o John Stevenson, Secretary  
Ontario Securities Commission  
20 Queen Street West  
Suite 1900, Box 55  
Toronto, Ontario M5H 3S8  
e-mail: [jstevenson@osc.gov.on.ca](mailto:jstevenson@osc.gov.on.ca)

and

M<sup>c</sup> Anne-Marie Beaudoin  
Corporate Secretary  
Autorité des marchés financiers  
800, square Victoria, 22<sup>e</sup> étage  
C.P. 246, tour de la Bourse  
Montréal (Québec) H4Z 1G3  
e-mail: [consultation-en-cours@lautorite.qc.ca](mailto:consultation-en-cours@lautorite.qc.ca)

Submissions to the Investment Industry Regulatory Organization of Canada to:

James Twiss  
Investment Industry Regulatory Organization of Canada  
Suite 1600  
121 King Street West  
Toronto, Ontario  
M5H 3T9  
Email: [jtwiss@iiroc.ca](mailto:jtwiss@iiroc.ca)

We cannot keep submissions confidential because securities legislation in certain provinces requires that a summary of the written comments received during the comment period be published.

Questions may be referred to any of:

Matthew Thompson  
Ontario Securities Commission  
(416) 593-8223

Susan Greenglass  
Ontario Securities Commission  
(416) 593-2740

Tracey Stern  
Ontario Securities Commission  
(416) 593-8167

Élaine Lanouette  
Autorité des marchés financiers  
(514) 395-0337 X4356

Serge Boisvert  
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(514) 395-0337 X4358

Doug Brown  
Manitoba Securities Commission  
(204) 945-0605

Lorenz Berner  
Alberta Securities Commission  
(403) 355-3889

Mark Wang  
British Columbia Securities Commission  
(604) 899-6658

Michael Brady  
British Columbia Securities Commission  
(604) 899-6561

Doug Mackay  
British Columbia Securities Commission  
(604) 899-6609

## Glossary

- Algorithm:** A set of rules for accomplishing a task in a certain number of steps. Trading algorithms outline steps taken to execute orders. Different algorithms may be selected for different orders based on the execution strategy of the user.
- Auction Market:** A market where buyers enter competitive bids and sellers enter competitive offers at the same time. The price a stock is traded is at the highest price a buyer is willing to pay and the lowest price a seller is willing to sell at. Matching bids and offers are paired together and the orders are executed.<sup>36</sup>
- Bypass marker:** A marker that when added to an order bypasses hidden liquidity, Special Terms Orders, and other “specialty orders,” and executes only against displayed volumes on a marketplace prior to the execution or cancellation of the balance of the order.
- Call market:** A market in which each transaction takes place at predetermined time intervals and where all of the bid and ask orders are aggregated and transacted at once. The marketplace determines the market clearing price based on the number of bid and ask orders.
- Crossed market:** When one participant’s bid (offer) on one marketplace is higher (lower) than another participant’s offer (bid) on the same or a different marketplace.
- Crossing network:** The first electronic Dark Pools where large orders are entered and execute at predetermined time intervals throughout the day.
- Dark Pool:** A marketplace that provides no pre-trade transparency.
- Databasing:** A practice where a smart order router keeps records of orders that are sent through it and uses this information in subsequent order routing decisions.
- Discretionary-Reserve Orders:** A reserve order where the reserve portion of the order can execute at an alternative price, or range of prices specified by the user.
- Electronic Liquidity Providers (ELP):** Typically high frequency traders who try to profit by capturing the bid ask spread of a security. ELPs may send thousands of orders per second, have holding periods of less a second, and try to end each day with zero market or single stock risk.
- Fully-Hidden Orders:** Orders about which no information is displayed to an information processor or information vendor.
- Gaming:** Trading strategies that try to detect and then exploit existing orders for profit. Gaming strategies may utilize tactics including misrepresenting false or

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<sup>36</sup> “Auction market.” *Investopedia*. <http://www.investopedia.com/terms/a/auctionmarket.asp>

misleading information of their trading intentions and manipulating the behaviour of other participants in reaction to this information.

**Indication of Interest (IOI):** IOIs include messages sent from a marketplace that contain certain information about resting orders on that marketplace. Information contained in an IOI may include information on one or more of, but not all of; symbol, side, size, or price.

**Information Leakage:** When information about an order is released before it is fully executed. Information leakage enables participants to trade ahead of an order which can significantly increase market impact costs.

**Market Fragmentation:** Occurs when a market's liquidity is divided among multiple marketplaces.

**Market Impact Costs:** The costs that are incurred when the price of execution is different than the target price. It is possible for market impact costs to be negative.

**Market in Financial Instruments Directive (MiFiD):** A directive providing a harmonized regulatory regime for investment securities across the member state of the European Economic area. The directive officially took effect on November 1st, 2007.<sup>37</sup>

**Market Peg Order:** An order that is priced and re-priced as necessary to equal, or to be higher or lower than a reference bid, offer, or mid-point between a bid and offer.

**Mid-Peg Order:** A mid-peg order is an order that floats at the mid point in the book and can execute against an opposite mid-peg order or incoming market order. Mid peg orders are often hidden.

**National Best Bid (NBB):** In respect of a particular security, the best bid of a standard trading unit across all transparent marketplaces excluding Special Terms Orders.

**National Best Bid Offer (NBBO):** In respect of a particular security, the best bid and offer of a standard trading unit across all transparent marketplaces excluding Special Terms Orders.

**National Best Offer (NBO):** In respect of a particular security, the best offer of a standard trading unit across all transparent marketplaces not inclusive of Special Terms Orders.

**Parallel Smart Order Router (spray):** A smart order router that makes order routing decisions by slicing up a single order into smaller orders and sending multiple orders to several marketplaces simultaneously.

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<sup>37</sup> "Markets in Financial Instruments Objective." *Investopedia*. <http://www.investopedia.com/terms/m/MiFiD.asp>

**Pegged Offset Order:** A reference-priced order where an increment/decrement is added to the national best bid or national best offer. For example, a pegged offset order of Bid+1 would peg to the national best bid plus a penny.

**Post-trade Transparency:** Refers to the ability of the public to see information about the price and volume of a trade after it has been executed. Information includes the volume, symbol, price and time of the trade.

**Pre-trade Transparency:** Refers to the ability of the public to see information about orders posted on a marketplace. Information includes the volume, symbol, price and time of the order.

**Primary Peg Order:** A reference-priced order that is automatically priced, and subsequently re-priced as necessary, to equal either the reference bid, in the case of a buy, or the reference offer in the case of a sell.

**Reserve Order (Iceberg Order):** An order that displays only a portion of its total volume at a price that the participant is willing to trade. When the visible portion of the order is executed, an additional visible order is automatically generated by the trading system of the marketplace drawing from the total size and decreasing the amount of the reserve.

**Serial Smart Order Router (iterative):** A smart order router that sends the entirety of an order to the marketplace with the best posted bid or offer. Whatever volume is not executed at this price is re-sent by the SOR as another complete order until the original order is filled.

**Size Discovery:** The ability for a market to identify and attract large orders.

**Smart Order Router:** A technological tool that scans multiple marketplaces for the best-displayed price and then routes orders to that marketplace for execution. This can potentially help traders achieve better-priced executions, as well as saving time and effort with traders trying to manually locate the most appropriate execution point.

**Special Terms Order:** An order that is less than a standard trading unit, or is subject to a condition other than price or being settled on the third business day following the trade unless specified by a marketplace.

**Subscriber:** A person or company that has entered into a contractual agreement with an ATS to access the ATS in order to trade, or disseminate or display orders of the ATS.

**Upstairs market:** Where large blocks of shares are either worked by dealers who try to cross them with other client orders on an agency basis, or with inventory orders using their liability capital on a proprietary basis.