

CELENT

DARK POOLS

IN THE EYE OF THE STORM

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EXECUTIVE SUMMARY

Dark pools have been attracting a lot of attention in recent months. Increasing trading volumes on dark pools in the US and Europe during the last five years have raised a debate on the implications on market structure, market quality, trading costs, and if more trading will move to dark pools. **Even if more trading moves to dark pools in the next few years, it would raise great concern over the future of lit markets.**

Dark pools can be broadly classified as exchange-sponsored, broker-dealer-sponsored, or independent. Exchange-sponsored dark pools are mostly targeted at the high-frequency trading (HFT) community; these dark pools form an important component of HFTs automated trading strategies. Broker-dealer-sponsored dark pools are able to provide their clients with flexibility to interact with preferred liquidity, while independent dark pools cater to specific needs such as reduced market impact for block trades.

Broker-dealer sponsored dark pools have devised mechanisms to segregate liquidity based on the trading behavior of the trading participants. This allows them to identify which liquidity is toxic and which is valuable, which is very attractive to the buy side traders. **Investors who are looking to avoid interacting with toxic and aggressive liquidity, usually from high frequency trading firms, see great value in trading on dark pools.**

Technology has played a major enabling role in the development of dark pools. Technology has made the electronification of OTC trades easier and matching of trades more efficient. **Another important reason for the growth in dark pool trading is that they offer better prices.** The ability to trade at mid-point of the spread on lit venues offers price advantage, along with saving on exchange fees. However, there is a trade-off between taking a better price off-exchange and delaying in finding matching liquidity.

Average trade sizes on dark pools have been on a downward trend in the last five years in the US and Europe. Increasing algorithmic handling of orders, along with lack of book depth on dark pools are important factors for the reduction in execution sizes. In the US, the average trade size executed on dark pools is around 200 shares, which is similar to average trade size executed on exchanges. This raises an important question, especially from lit market operators' point-of-view whether dark pools are causing liquidity to be hijacked from lit venues which would adversely affect the functioning of the equity markets.

Nevertheless, dark pools are an important component of market structure. **Some of them specifically facilitate execution of large blocks by minimizing information leakage and market impact.** Any regulatory treatment of dark pools must ensure that this function is not adversely affected. **All dark pools are not equal.** It is important that the variety among dark pools be taken into account.

The regulatory debate on dark pools is around issues such as market abuse, price formation, and equal access. There have been instances in the recent past of dark pool operators indulging in unfair practices and misusing information to benefit certain participants. This raises several questions over how dark pools operate internally, and whether they pose a threat to the entire market. Regulators in Europe are currently debating whether a 'volume cap' mechanism should be put in place putting a maximum limit on the levels of dark pool trading. In the US, regulators are looking at greater information sharing and transparency about how dark pools operate.

The current levels of dark pool trading in Europe are not sufficiently high to require a regulatory intervention, especially when weighed against the benefits to end investors. However, mandatory reporting requirements on trading volumes would be appropriate at this stage. Getting a clearer understanding of trading behavior in dark pools, improved transparency and information sharing with clients for broker-dealer-sponsored dark pools should be the focus-areas at this stage.

INTRODUCTION

Dark pools are a heated topic of debate in market structure circles. Their growing use over the last few years has raised a lot of interest along with skepticism and fear among various market participants. The ongoing debate around high frequency trading and market structure has now extended to include dark pools. The role of dark pools in strengthening or hampering market quality, and its possible offshoots contributing to systemic risk is now being studied with greater interest. Regulators have now entered the debate and the industry anticipates greater regulatory oversight and control over dark trading activity.

Dark trading itself is not a new phenomenon. Private trading has been taking place for a long time. “Upstairs trading”- which is a form of private trading, can be looked at as a type of dark trading. The invasion of technology into trade matching and execution has resulted in improved access to dark trading for participants and resulted in increasing off-exchange activity.

If we track the evolution of capital markets structure in US and Europe, it is clear that regulatory changes combined with technological advances have resulted in greater efficiency by promoting competition and reducing trading costs, both for institutional and retail investors. The emergence of dark pools is a result of the ongoing evolution of market structure. However, the changes in market structure over the last five years has also resulted in greater complexity, thereby making it difficult to assess the contribution of each of those developments to the overall gains or losses in isolation, as there also have been events of market abuse and technology failures. Some allege that it has created an uneven playing field for different market participants. Exchanges, for example, subscribe to the view that uneven regulation has resulted in the growing popularity of dark pools.

Dark trading offers several benefits to investors, especially pension funds and asset managers transacting large blocks of liquidity. In addition to providing block liquidity, it assists in minimizing market impact costs and helps control information leakage. Secondly, investors are able to obtain price improvement, by usually trading at the mid-point within the spread offered by lit exchanges. These amount to large savings especially considered in the context of block executions. Thirdly, overall trading costs are also lowered by transacting on dark venues as compared to lit exchanges by saving on exchange fees.

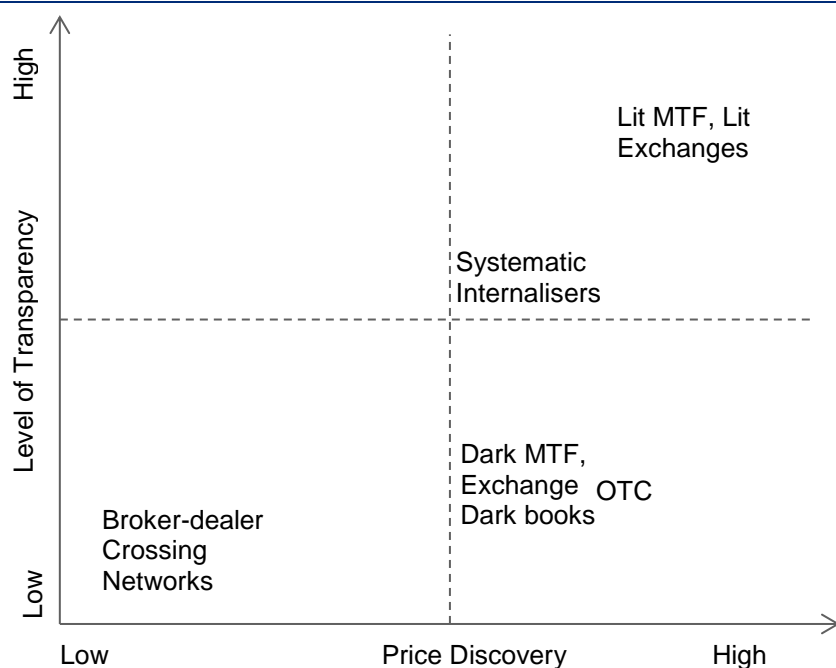
The recent rise in off-exchange trading volumes, of which dark pools are one component, has attracted a lot of attention including that of the regulators. The primary concern is the impact of rising off-exchange volumes on liquidity and price discovery. Regulators in the US and Europe are engaged in a consultation process with various industry participants. Lack of clarity on the real costs of dark trading as opposed to its benefits and mixed opinions emerging from academic research make this an enormously challenging task for the regulators.

In this report, we examine the key factors that have led to the growth of dark trading in recent years. We look at the evolution of dark trading in the US and Europe and focus on some of the key statistics relating to the debate of lit vs. dark trading. Then, we look at some of the current issues that are critical from a regulatory point of view. Keeping current trends in view, we present an analysis about the future of dark pools.

OVERVIEW OF DARK POOLS

Dark pools are automated trading systems that operate with limited pre-trade transparency. As a result, it appears that they function under a veil of secrecy. Limited pre-trade transparency is however crucial to the way they operate. They form an important segment of market structure because they allow large blocks to find liquidity with limited market impact. One of the focal points of the current debate on dark pools is whether they are fulfilling that objective, especially with average trade sizes reducing at dark venues. Figure 1 illustrates the relative positioning of various types of trading venues. Exchanges are highly transparent and essential for price discovery, while dark pools are opaque and are price-takers instead of price-makers.

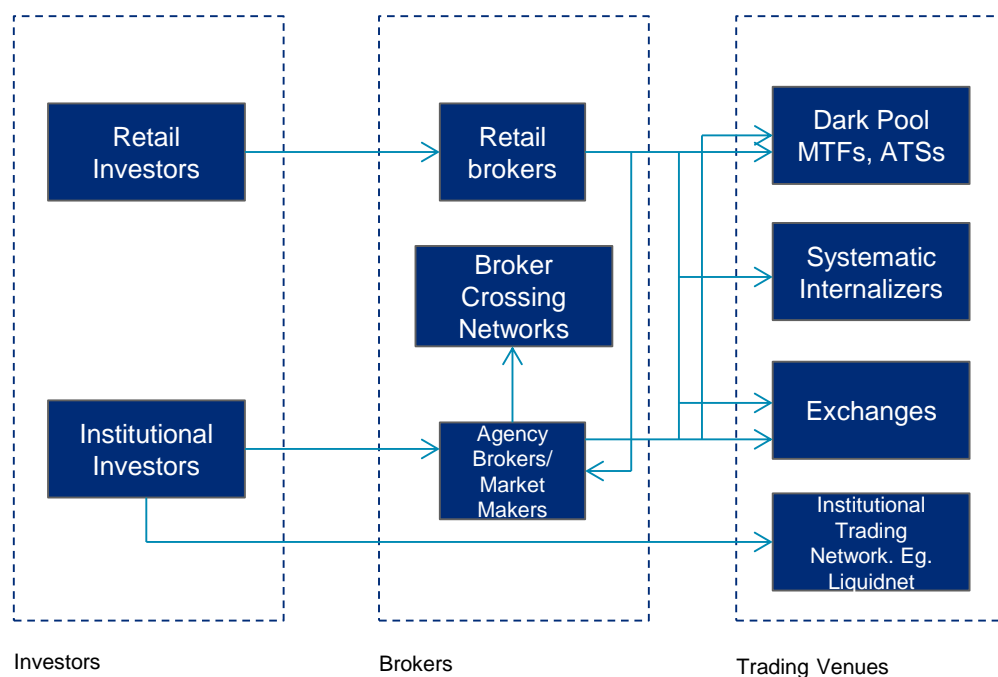
Figure 1: Positioning of Various Types of Trading Venues



Source: Celent

Dark pools are one component of the off-exchange trading universe. As Figure 2 illustrates, dark pools operated by multi-lateral trading facilities (MTFs, as referred to in Europe), alternative trading systems (ATSs as referred to in the US) along with exchanges, systematic internalisers and broker-dealer crossing networks allow investors to execute trades in the dark. However, each of them is subject to varying degree of regulatory oversight and reporting requirements. Exchanges are at one end of the spectrum with maximum regulatory oversight, while broker-dealer crossing systems are at the other end of the spectrum with the least regulatory oversight.

Figure 2: Typical Order Flow Between Market Participants Involved in Dark Pool Trading



Source: Celent

The differential regulatory treatment of the various off-exchange venues is one of the key issues in the current debate on dark pools.

KEY DRIVERS OF DARK POOL ACTIVITY

Regulation and Technology

It is difficult to overlook the influence of regulation and technology on market structure evolution, even though it sounds clichéd. We have observed in the last few years a cascading effect in the way capital markets have evolved since RegNMS and MiFID were implemented in the US and Europe respectively. The evolution has been led by technological innovation in various stages which led to the proliferation of algorithmic trading and subsequently high frequency trading. In principle, increased dark pool activity has been facilitated by the pervasiveness of algorithmic trading, along with efficient and reliable systems for matching trades automatically. The regulatory treatment of alternative trading systems has been equally important to the growth of dark trading. For example, large-in-scale waiver and reference price waivers in Europe have been instrumental in allowing trading at dark venues with limited pre-trade transparency.

Price Improvement

Price improvement is achieved on many levels by trading on dark pools. First, cost reduction is achieved by brokers by avoiding trade on exchanges and saving on exchange fees. An exchange access fee is typically 30 cents for 100 shares. Retail customer orders are usually filled by wholesale market makers who prefer to pay the brokerages to trade against these orders, rather than take liquidity from an exchange because it makes economic sense to them. Secondly, dark pools are able to provide price improvements to clients by executing trades at the mid-point of the bid-ask spread on lit exchanges, or providing marginal price improvement over the national best bid and offer (NBBO). Thirdly, market impact costs are significant for large block executions. Dark pools minimize market impact and information leakages that would otherwise put large

block traders, who are usually pension funds or asset managers, at a disadvantage. For example, Liquidnet, which is an institutional block trading venue, delivered average price improvement of 106 basis points in March 2013. It is significant price improvement considering that the average execution size on Liquidnet is around €900,000.

Greater Control for Buy Side

Broker-operated dark pools are attractive for another reason — they offer greater control to buy side traders, and even allow them to choose the type of liquidity they wish to interact with. Buy side traders who are looking to avoid interacting with toxic liquidity (usually aggressive and algorithm driven) on lit exchanges or avoid high frequency traders prefer off-exchange venues, which are relatively less toxic. Broker-operated dark pools have developed segmentation techniques whereby they are able to rank the quality (or toxicity) of the liquidity, and therefore separate out toxic liquidity. Tools are available to segment users based on their trading behavior and identify them as high-frequency, or institutional, or retail and also allow them to choose which segment they may want to interact with. Fair access rules at exchanges means that this type of control over trading is not possible.

Some of the broker-operated dark pools, such as Barclays LX, provide a high level of transparency to their clients in real time about where their orders are being executed, as well as the profile of liquidity they are interacting with. As a result, many of the broker-operated dark pools have witnessed a significant increase in flows. For example, Deutsche Bank's SuperX witnessed growth in volumes from €14billion in April 2012 to €16billion in April 2013. The focus of broker-operated dark pools on improving execution quality for their clients including intelligent routing capability, investments in reducing latency, greater transparency and control for their clients is paying off, which is evident in the large share of dark liquidity that they have been able to attract. We estimate that around 60% of dark trading happens on broker-operated dark pools.

TYPES OF DARK POOLS

Dark pools can be broadly classified into three types based on the characteristic of the entities sponsoring it. We identify them as exchange-sponsored, broker-dealer-sponsored, and independent, which is not sponsored by either of the other two. Lit exchanges and MTFs offer dark order books and also facilitate dark trading via order types. Some of these order types are tailored towards the high-frequency trading community and offer them an important tool in formulating automated strategies. Broker-dealer-sponsored dark pools offer flexibility as they are not bound by equal access rules. Independent dark pools cater to specific needs such as reduced market impact for block trades.

Table 1 highlights the different types of dark pools and their value propositions.

Table 1: Different Types of Dark Pools and Their Value Propositions

TYPE OF DARK POOL	VALUE PROPOSITION	SUCCESS FACTORS
EXCHANGE SPONSORED	<ul style="list-style-type: none"> • Equal access. • Conducive to implementing high frequency trading strategies. 	Lit exchanges and MTFs offer dark order books and also facilitate dark trading via order types. Some of these order types are tailored towards the high-frequency trading community and offer them an important tool in formulating automated strategies.
BROKER DEALER SPONSORED	<ul style="list-style-type: none"> • Price improvement by crossing at the mid-point of bid-ask spread. • Greater control for buy side investors, and ability to interact with preferred liquidity. 	Broker-dealer-sponsored dark pools offer flexibility as they are not bound by equal access rules.
INDEPENDENT	<ul style="list-style-type: none"> • Minimize market impact costs. • Significant cost savings for executing block trades. 	Independent dark pools cater to specific needs such as reduced market impact and exclusive liquidity pool for block trades.

Source: Celent

The appendix provides an illustrative list of dark pools in the US and Europe classified under each of the above-mentioned categories.

EVOLUTION OF DARK POOLS

DARK TRADING IN THE US

Off-exchange trading in the US is estimated to be accounting for around 40% of the total trading volume (in early 2013). One of the key points that we emphasize in the report is that the growth in dark pool activity needs to be evaluated in the context of rising off-exchange trading, of which dark pool MTFs or ATs are one component. The rise in off-exchange trading volumes is a matter of concern for the exchanges and the regulators.

One of the reasons for the rise in off-exchange trading volumes in 2013 is the relative stability (less volatility) in equity markets. As shown in Figure 3, the volatility index, VIX on S&P 500 has been under 15 for most of 2013. Since the reference price in mid-point matching systems at dark pools is derived from lit markets, traders may be reluctant to burden greater execution risk at dark pools during times of high volatility, and prefer to trade on lit markets instead.

Figure 3: Volatility VIX Index on S&P 500 in the Last Two Years



Source: Yahoo! Finance

As alluded to earlier in the report, exchanges certainly have a valid concern as some of the data brings into question whether the fair objectives that allowed limited pre-transparency to dark pools are being served or not. Dark pools provided a very useful function of minimizing market impact for executing large size orders. The average trade size executed on dark pools in the US is around 200 shares, which is similar to average trade size executed on exchanges. This suggests that minimizing market impact is certainly not on the high agenda for participants routing liquidity to these venues. In fact the execution sizes at dark pools are not very different from execution sizes seen at lit exchanges.

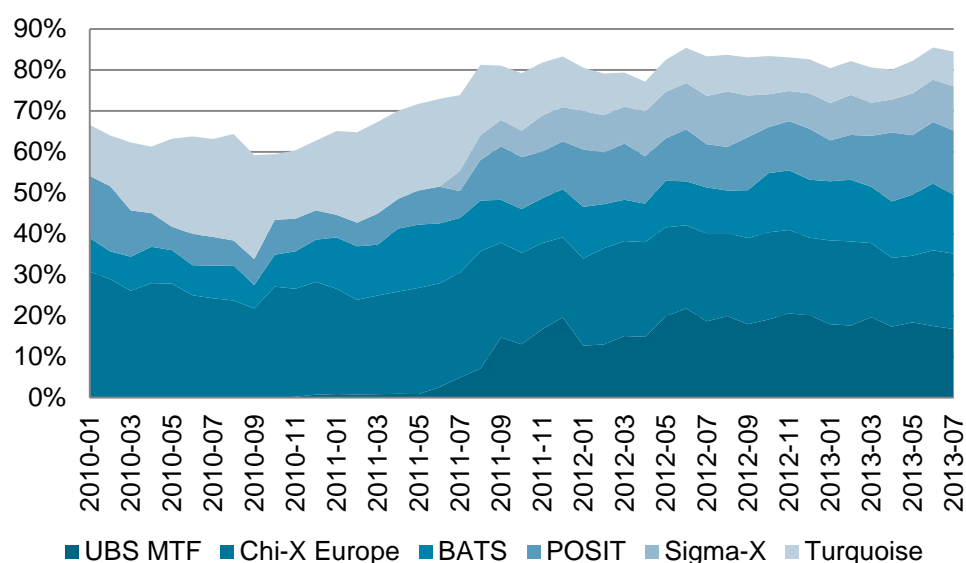
When traders route their orders to dark pools, they have to factor the possibility that their orders may not be filled. Finding matching liquidity of the desired size at the desired time is often difficult on dark pools. Orders do not rest for a sufficient period which would increase the chances of filling, owing to the algorithmic nature of the trading strategies, as they are routed to a different venue to find their fills. As a result, dark pools lack depth. Although liquidity is available, they are unable to match like 'ships passing in the night'. The increasing algorithmic nature of trading strategies, along with improving the chances of finding matching liquidity (or reducing partial fills) have resulted in reduced trade sizes on dark pools.

DARK TRADING IN EUROPE

In comparison with the US, dark pool activity in Europe has picked up more recently. As the latest data suggests, the share of dark pool trading in Europe is around 6%. Similar to the evolution trajectories of market structure in the US, the evolution of dark trading has largely been driven by the formation of new trading venues and the growing use of algorithms for executing trades in Europe as well.

As Figure 4 suggests, dark execution at MTFs in Europe is highly concentrated — the top six venues account for over 80% of the total turnover at dark pool MTFs, increasing from around 70% of the total turnover in 2010. Among the leading dark pool venues, Turquoise has witnessed the most market share erosion, declining from a high of around 27% market share in August 2010 to around 8% in July 2013.

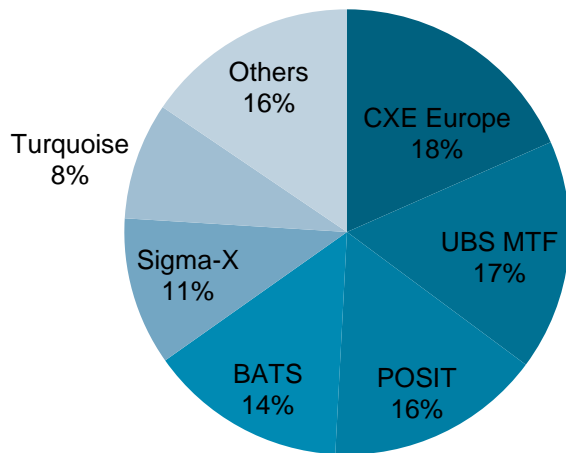
Figure 4: Share of Equity Trading Volumes (Number of Shares) of Leading European Dark Pool MTFs from January 2010 to July 2013



Source: Thomson Reuters

CXE Europe is the largest venue among dark pool MTFs in Europe. However, if we look at venue groups, BATS Chi-X Europe is the largest accounting for around 33% of the total turnover at dark pool MTFs in Europe, as indicated in Figure 5.

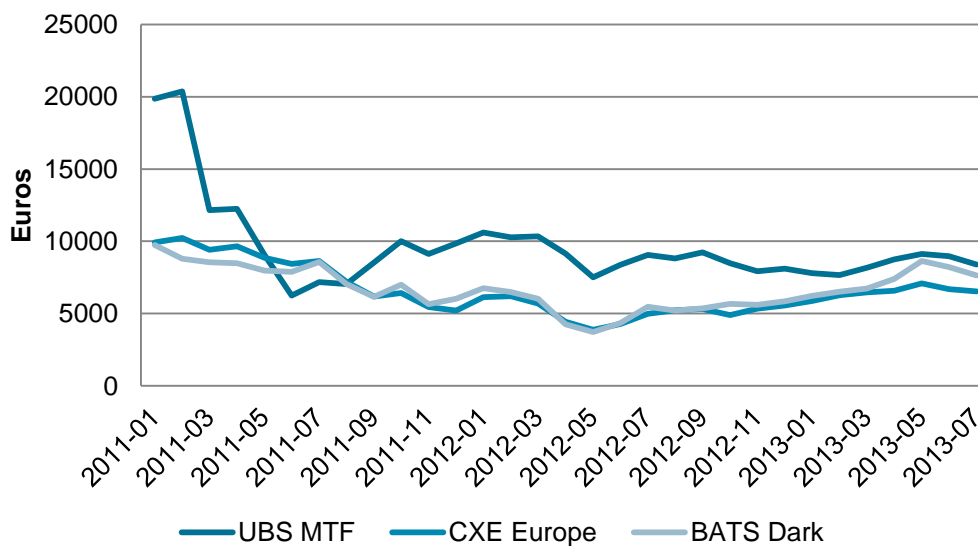
Figure 5: Share of Equity Trading Volumes (Number of Shares) of Leading European Dark Pool MTFs in July 2013



Source: Thomson Reuters

Reduction in trade sizes has been a consistent trend over the past two years in equities, both for exchange and off-exchange trading. We see a similar trend with average trade sizes at dark pools. Figure 6 shows the average trade sizes at the top three dark trading MTFs, and we observe that the average trade sizes have mostly remained between 5,000 and 1,000 euros from 2011, with UBS MTF registering slightly higher average trade sizes compared to BATS Dark and CXE Europe, which have closely traced each other with respect to average trade sizes. We believe that days of large block trading are mostly behind us, as increased pervasiveness of algorithmic trading, especially slicing and dicing algorithms achieve better executions with smaller trade sizes.

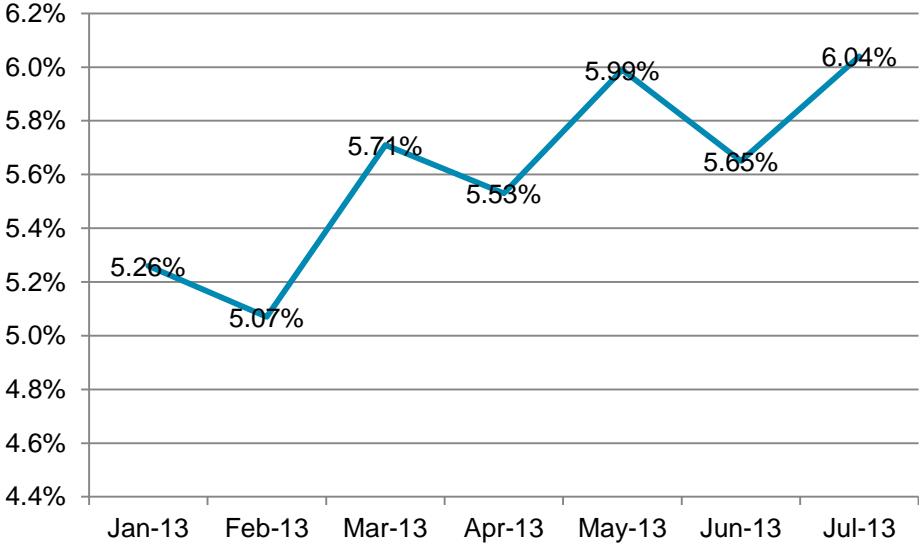
Figure 6: Average Trade Sizes (Euros) at Leading European Dark Pool MTFs



Source: Thomson Reuters

As a percentage of the total trading (turnover) at exchanges and MTFs, dark pools have increased their share from 5.26% in January 2013 to 6.04% in July 2013, as shown in Figure 7. The trend is clearly upwards, and July has seen the highest dark pool activity in 2013 so far.

Figure 7: Share of Trading on Dark Books at European Exchanges and MTFs, by Turnover, in 2013



Source: Thomson Reuters

REGULATORY DEBATE

MARKET ABUSE

That dark pools operate under limited pre-trade transparency rules as well as disclose limited information voluntarily, raises questions as to whether there are unfair practices being followed, in addition to concerns about their impact on market quality and price discovery. Confirming some of these fears, there indeed have been instances in the recent past where dark pool operators have been found to indulge in unfair practices.

The recent examples of Pipeline Trading Systems and Level ATS indicate that abuse is possible, and sometimes even hard to detect. Pipeline Trading Systems was fined US\$1 million by the SEC for allegedly allowing a secretive trading unit to interact with a vast majority of client orders and failing to disclose it. Level ATS was alleged to be sharing confidential client trading information with one of its investors.

The opinion of the regulators largely seems to be that dark pools, in themselves, are not inherently bad, but they certainly raise concerns about market abuse since the quoting is not visible. Since most dark pools use market prices on lit exchanges as reference prices, it is technically possible to manipulate execution prices at dark pools by artificially moving prices on the exchanges. High frequency traders certainly benefit from any knowledge on price movement on lit exchanges before their orders hit dark pools, thereby raising concerns of misuse.

PRICE FORMATION

In the previous section we saw that the volumes executed on dark pools have grown considerably since 2008, and correspondingly exchanges have lost market share. Of concern to exchanges is the fact that dark pools are not subject to the same rigour of regulation and disclosure requirements that exchanges are subject to. However, it should be mentioned at this point that exchanges are also able to avail of certain unique privileges. Exchanges also have their version of dark trading, which is facilitated through various order types. The reference prices that dark pools use to match orders are provided by exchanges and market data is a source of revenue for exchanges. Unlike exchanges, brokers pay clearing fees, as well as fulfill best execution obligations in addition to RegNMS, while exchanges are only bound to obey RegNMS.

In recent months, exchanges too have tried to introduce their own versions of dark trading, notably by allowing use of specific order types which enable orders to be hidden or lit based on their positions in the queue, or other such combinations. These changes are mainly being driven by HFT traders who form a sizeable segment of the exchanges' trading clients. Another example is NYSE's Retail Liquidity Program (RLP) launched in August 2012, and since seen rising volumes on its platform. The program allows retail brokers to benefit from price improvements in a dark-pool like environment to trade against market makers and other NYSE members. An average of 7.9 million shares were traded on the RLP in July 2013.

EQUAL ACCESS

Equal access is another point of debate. While exchanges are able to provide equal access to all market participants in a transparent manner, the same cannot be said about broker-operated dark pools. It raises several doubts over whether broker operators of dark pools favour certain investors over others, as well as their information sharing mechanism. There have been instances where broker operators of dark pools have tried to benefit from information on incoming orders into their dark pools, either through

principal trading or helping select clients benefit from this information. This interestingly coincides with the growing control of buy side traders in deciding where and how their trades execute.

REGULATORY DEVELOPMENTS

“Volume Cap” Mechanism in Europe

In the European context, dark pools enjoy pre-trade transparency waivers, namely:

- Large in scale waiver.
- Reference price waiver.

A large in scale waiver allows large trades to be executed off-exchange; a reference price waiver allows trades to be executed off-exchange at the midpoint between best bid and offer. The debate is ongoing as to whether these waivers should continue or their scope be narrowed down. The debate over pre-trade transparency waivers for equities has been going on for quite some time but political disagreement has delayed the regulatory process, as mentioned in the May 2013 Celent report *MiFID 2 Pre- and Post- Trade Transparency: Is There Light at the End of the Three-Year Tunnel?* The growing dark pool phenomenon has meant that pre-trade transparency waivers have become a hot topic of debate once again.

Under the latest version of MiFIR released in June 2013, regulators have clearly hinted at the possibility of artificially restricting the volumes that are executed off-exchange by introducing a volume cap mechanism. Article 4a, which relates to this, says :

In order to ensure that the use of the waivers provided for in Article 4(1)(a) and 4(1)(b)(i) does not unduly harm price formation, trading under these waivers is restricted as follows:

- i) The percentage of trading in an instrument carried out on a trading venue under these waivers shall be limited to 4% of the total volume of trading in that instrument on all trading venues across the Union over the previous 12-month period.*
- ii) Overall EU trading in an instrument carried out under these waivers shall be limited to 8% of the total volume of trading in that instrument on all trading venues across the Union over the previous 12-month period.*

On the penal action for violating this mechanism, it further says:

4a(2) When the percentage of trading in an instrument carried out on a trading venue under the waivers has exceeded the limit referred to in paragraph 1(i), the competent authority that authorized the use of these waivers by that venue shall within 2 working days suspend their use on that venue in that instrument based on the data published by ESMA referred to in paragraph 4, for a period of 6 months

4a(3) When the percentage of trading in an instrument carried out on all trading venues across the Union under these waivers has exceeded the limit referred to in paragraph 1(ii), all competent authorities shall within 2 working days suspend the use of these waivers across the Union for a period of 6 months.

In its current form the volume cap mechanism poses several questions, especially with regard to its implementation. Unless there is a reliable real time system that can raise an alert in time before the volume cap is breached, traders may be less willing to route their

orders to dark pools at all. The punishment is too steep for dark pool operators as well, and therefore there is a legitimate fear that the regulation might end up reducing dark trading more than it intends to.

A careful evaluation is also needed of its possible impact on the use of dark venues for block trading. Imposing any artificial restriction on dark trading without recognizing the variety in investor and execution patterns would be overlooking some of its key benefits, such as reduced market impact for block trades. Notwithstanding the fact that large block trades form a small percentage of trades currently being executed in the dark, it forms an important component of market structure and needs to be preserved.

Mandatory Disclosure in the US

On the other hand, the US is looking to have greater clarity on dark pool trading activity. The Financial Industry Regulatory Authority (FINRA) has recently proposed a mechanism for greater disclosure of trading activity conducted on ATSs. FINRA has proposed to introduce a unique identifier code for each ATS used for reporting trades. Among ATSs, FINRA also proposes to include broker-dealer internalisers and broker-dealer crossing networks. The SEC has approved the plan, and soon ATSs would have to report weekly securities level volume data to FINRA, which would then publish the data on its website with a two-week delay for liquid instruments and four-week delay for less liquid instruments. The American exchanges, viz. NYSE Euronext and Nasdaq OMX, are proposing that orders be routed to lit exchanges unless dark pools are able to offer price improvement. This is a harsher proposal, and we don't expect such a rule to be put in place soon.

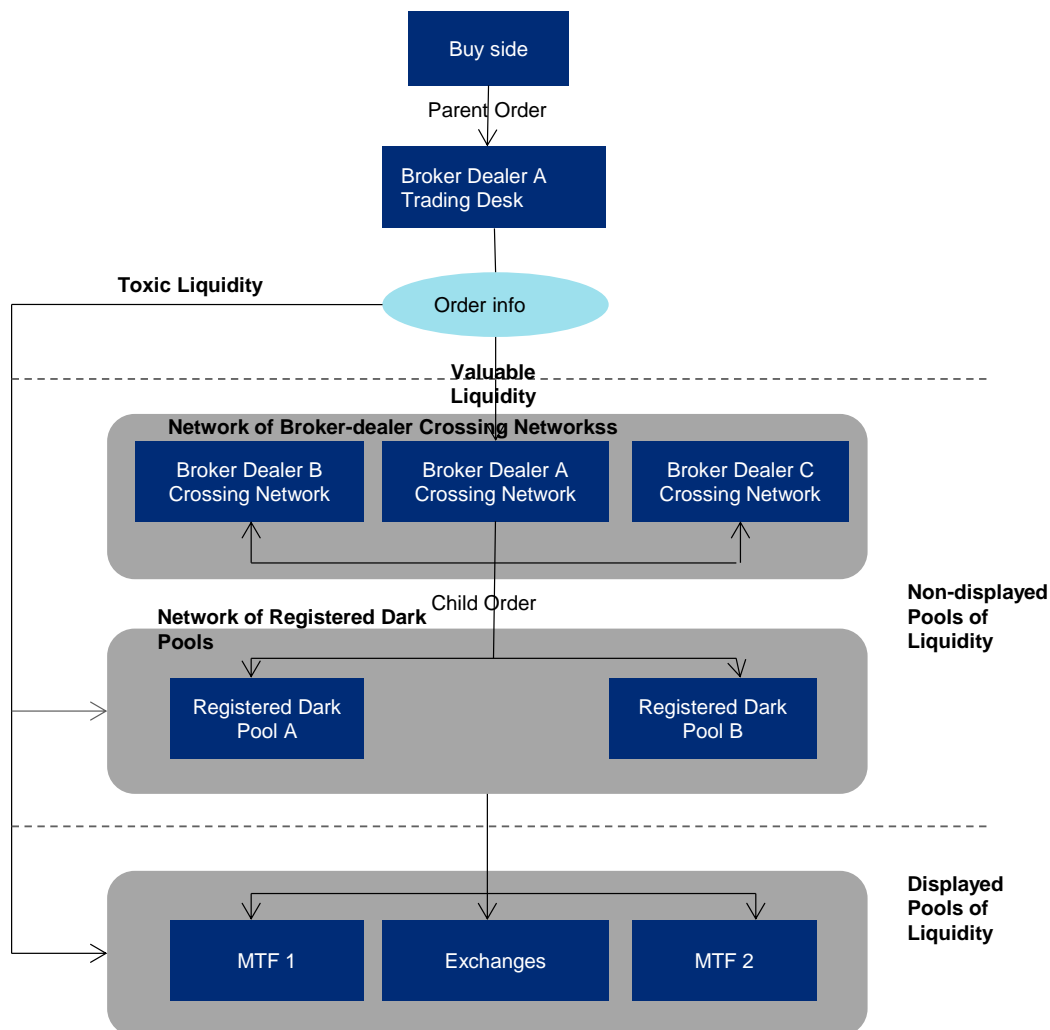
Until now, some dark pools have been self-reporting trading volumes executed on their platforms, although aggregate volumes are reported to trade reporting facilities. Self-reporting is not standardized, which is one of the reasons why dark pools that were earlier voluntarily disclosing trading volumes, such as Credit Suisse CrossFinder have stopped disclosing. With SEC giving a green signal to reporting ATS volumes, we expect to see greater transparency in dark trading going forward in the US.

LOOKING AHEAD

REGULATING BROKER-DEALER CROSSING NETWORKS

Broker-dealer crossing networks are an important component of dark trading activity. The term “broker-dealer crossing networks” is often used interchangeably with “broker-operated dark pools.” Broker-dealer crossing networks account for a significant share of the total trading volumes traded away from the lit venues. For example, in Europe, Celent estimates that currently around 60% of the total equities trading volumes executed away from the lit venues is executed by broker-dealer crossing networks. Exchange-sponsored dark pools, independent dark pools, and systematic internalisers make up for the estimated remaining 40%. The current debate around dark trading has focused specifically on the role of broker-dealer crossing networks as part of the dark trading ecosystem. Figure 8 shows the typical trade flow through broker-dealer crossing networks. As illustrated here, the discretion to segregate toxic liquidity from non-toxic or valuable liquidity that is available at its disposal makes broker-dealer crossing networks valuable to the buy side, or wholesale dealers executing aggregated retail liquidity.

Figure 8: Typical Order Flow through Broker-Operated Crossing Networks

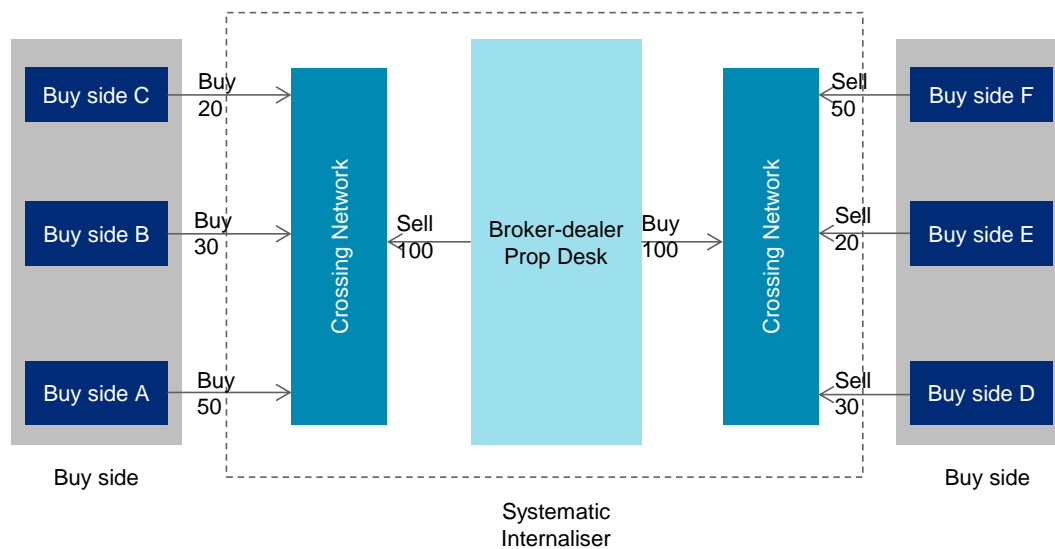


Source: Celent

Broker-dealer crossing networks operate under a regulatory loophole. While the intent behind allowing broker-dealers to cross trades internally without requiring full pre-trade transparency is to benefit end investors by saving on trading costs of executing on exchanges, it presents an advantage that other venue types do not similarly enjoy. For example, in Europe, MiFID allows for trading venues to be classified under three categories: regulated markets, multilateral trading facilities, and systematic internalisers. The nature of trading activity on most broker-dealer crossing networks resembles a combination of systematic internalisers, MTFs, and OTC activity.

There has been great clamor for registering broker-dealer crossing networks as systematic internalisers. While it is true that broker-dealer crossing networks are able to handle multi-lateral trading activity, nevertheless, the structure of a systematic internaliser would allow multi-lateral trading to be handled as bilateral trades, by having the broker-dealer act as a principal to every transaction, as shown in Figure 9.

Figure 9: An Illustration of a Broker-dealer Systematic Internaliser Handling Multilateral Trading



Source: Celent

Another proposed method to deal with the problem of broker-dealer crossing networks operating under a regulatory loophole is to classify them as Organized Trading Facilities (OTF), which is a new regulated venue introduced in the current review of MiFID. The two are contrasting proposals. While asking broker-dealer crossing networks to register as Systematic Internalisers would require the broker-dealer to act as a principal against all client order-flow, registering the broker-dealer as an OTF would prohibit employing the firm's own capital for trading against client orders. However, the underlying principle of increasing transparency and bringing a structure around off-exchange trading is acceptable to most market participants.

Regulators in Australia and Canada have tried to address the issue of growing dark pool volumes in recent months. Canada introduced a price improvement mechanism for smaller size orders (defined as orders under 5,000 shares or C\$100,000 in value). Dark venues are required to offer at least half a tick price improvement for stocks with one tick spread on the reference price, and full tick price improvement for stocks with higher spreads. Australia too has imposed price improvement requirements for smaller size orders. Regulators around the world are closely watching the developments in these two markets, which may well serve as a template for dark pool regulation depending upon the outcome. Both Canada and Australia have tried to address the smaller-order-size end of

the spectrum which is likely based on the diagnosis that larger order sizes executed on dark pools are not a threat to the efficient functioning of markets.

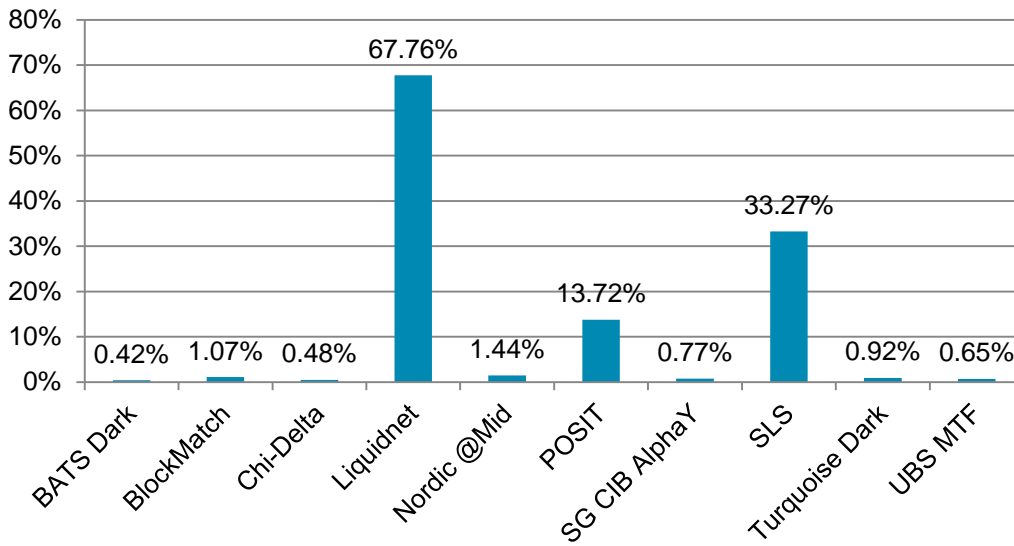
ANTICIPATING BROADER REGULATORY FRAMEWORK

We have seen that dark trading levels have increased considerably in the last five years. Consequently it has become a topic of debate and scrutiny, and perhaps it is important to take a view now on whether the off-exchange trading levels, which include dark trading, have reached such high levels as to harm the efficient functioning of the market. If we are to gather a clue from developments in recent past, such as the regulatory stance taken towards dark trading in Canada and Australia, as well as gauge the direction that popular debate is leading us towards, it appears that there is wide support for imposing artificial controls to prevent the growth of dark trading activity, both in the US and Europe. However, it is important to understand that it is not yet a settled question whether the current levels of dark trading activity deserve regulatory intervention. Academic research too is not conclusive on where the inflection point lies, beyond which it becomes necessary to intervene.

In order that there is a balanced counterview, we have to examine the characteristics of dark pools.

- The argument for controlling dark trading activity by way of regulation pre-supposes that the liquidity flowing to dark trading venues would naturally be diverted to lit venues, should there be restrictions imposed on dark trading. This need not necessarily be true. In fact it becomes clearer when we look at the nature of liquidity at dark venues carefully that it is not a natural outcome. Avoiding interaction with toxic liquidity is an important motivation for certain traders for choosing dark venues. Efforts to limit dark trading would not readily result in such liquidity moving to lit venues. Dark execution is part of algorithmic trading strategies for certain traders, and in the event of the strategy's inability to execute on dark venues, the algorithm would not readily direct the liquidity to lit venues.
- With the proliferation of slicing and dicing algorithms, we witness that large sized executions are mostly a phenomenon of the past, as average trade sizes on dark venues have been falling consistently over the last four years, dark venues are still valuable to investors executing block orders. Figure 10 shows the percentage of trading value executed on some of the European dark pools that could not have been executed on lit venues, owing to large order sizes. For most dark pools, this accounts for a tiny share of the total trading value, at less than 1%. However, for venues such as Liquidnet, SIX Swiss Exchange Liquidnet Service (SLS) and POSIT, this is significantly higher. Figure 10 clearly brings out the fact that not all dark pools are equal, in fact some of them differ significantly from the others.

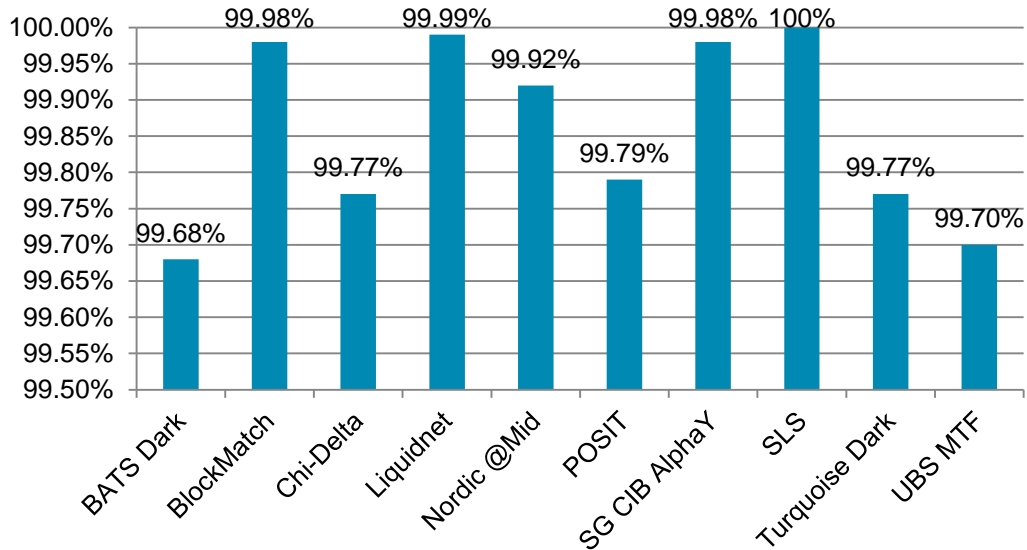
Figure 10: Percentage of Illiquid Trading on European Dark Pools



Source: LiquidMetrix

- Price improvement is one of the important reasons for choosing to execute on dark pools. At most dark pools, over 99% of the trades execute inside the best-bid-offer, as shown in Figure 11. Since most of these trades execute at the mid-point or offer tiny price improvement, investors stand to benefit. However, this assessment is in isolation, and not accounting for the impact on bid-ask spreads on lit venues due to increased fragmentation of liquidity or loss of price-making as a result of dark trading.

Figure 11: Percentage of Trades Executed Inside the European Best Bid Offer on European Dark Pools

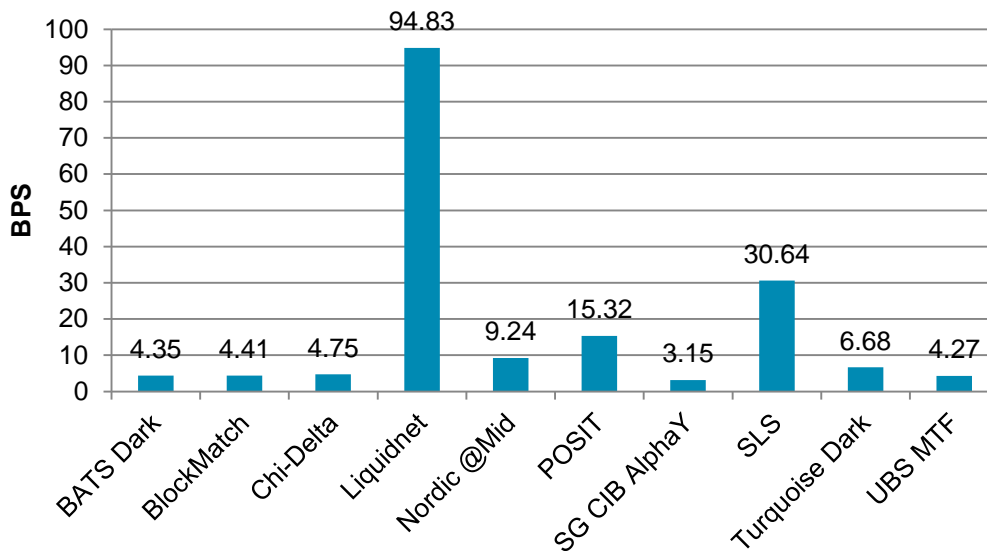


Source: LiquidMetrix

Figure 12 shows the average price improvement achieved by traders on different European dark pools. We are able to draw a similar conclusion, that, not all dark pools are equal. Clearly, venues such as Liquidnet, SLS, and POSIT are preferred venues for

block trading, and as a result, the price improvement achieved on these venues is also significantly higher when compared to other dark pools.

Figure 12: Average Price Improvement Achieved on European Dark Pools



Source: LiquidMetrix

The current levels of dark pool trading in the US and Europe are not sufficiently high to require a regulatory intervention, especially when weighed against the benefits to end investors such as reduced costs and reduced market impact. Although the growth of market share of dark pool trading has been impressive, it has to be viewed along with low baseline and low overall levels. Our analysis suggests that an immediate regulatory intervention to artificially restrict dark pool trading may not be required. However, mandatory reporting requirements on trading volumes, trading behavior, improved transparency and information sharing with clients would be appropriate at this stage. It would also allow regulators to work with better data. It is needless to say that more data on dark pool activity would bring greater clarity on policy implications to various market participants and the equity market structure.

If regulators, nevertheless, decide to introduce measures that impose volume caps or minimum price improvement, we would suggest that the variety among dark pools be taken into account. Specialized venues for block trading serve an important purpose; therefore they should be identified and treated separately. The regulatory signal that would go out to market participants, if they decide to impose volume caps or ensure minimum price improvement, would most likely result in volumes drying up on dark venues.

CONCLUSION

As we have seen in this report, all dark pools are not equal. The impact of imposing regulatory controls on all dark pools equally needs to be evaluated carefully. It is a challenging task because a bid to control excessive trading at dark pools could adversely impact investors trading large blocks at specialized venues. Liquidnet, SLS, and POSIT in Europe, for example, were set up to serve precisely this utility — to assist in executing large blocks while minimizing impact costs. It is important to keep this utility alive, as it is an important component of market structure.

There are no easy answers to the question of what the optimal share of trading is that should be allowed to execute in the dark to achieve the right balance. However, it is important to understand that merely forcing the volumes away from dark pools to lit exchanges may not necessarily result in reduced trading costs and improved market quality. In fact, it may adversely impact retail investors. While greater disclosure and transparency are necessary and regulators should move in that direction, we are skeptical about whether imposing artificial restrictions on dark pool trading would yield better results. Australia and Canada have already put such measures in place, and it would be wise to learn from the experiences of these two markets. There are conflicting views on whether these measures have improved the quality of equity markets and reduced trading costs for investors, but a clearer picture is expected to emerge in the next six months. Regulators in the US would be placed in a much better position if dark pool disclosures are made mandatory soon. A better understanding of the operations of dark pools domestically, as well as drawing lessons from post-regulatory evolution of market structure in Australia and Canada would provide important feedback upon which regulatory actions could be based.

Was this report useful to you? Please send any comments, questions, or suggestions for upcoming research topics to info@celent.com.

APPENDIX

Table 2: An Illustrative List of Major Dark Pools in the US and Europe

GEOGRAPHY	EXCHANGE SPONSORED	BROKER-DEALER SPONSORED	INDEPENDENT
NORTH AMERICA	BATS	Credit Suisse Crossfinder	Liquidnet
	Nasdaq ATS	Goldman Sachs SigmaX	RiverCross
	ISE Midpoint Match	Barclays Capital LX	Instinet
	NYSE Matchpoint	Morgan Stanley MS POOL	ITG
		Citi Match	
		BNY ConvergEx VortEx	
		Citadel Apogee	
		Fidelity CrossStream	
	JPMorgan JPM-X		
EUROPE	LSE Turquoise	Credit Suisse Crossfinder	Liquidnet
	NYSE Euronext SmartPool	Goldman Sachs SigmaX	Instinet
	BATS Dark	Barclays LX	ITG
	CXE	Citi Match	
	Nasdaq NEURO Dark		
	SIX Swiss Exchange		
	Liquidnet Service (SLS)		
	Deutsche Borse Dark		

Source: Celent

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