

Research article

Dark Pools – Advantages and Disadvantages Over Traditional Exchange Markets From a Consumer's Perspective

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Abstract

By the "Markets in Financial Instruments Directive 2004/39/EC" (MiFID) in 2004, exchange trading changed completely. Until then, customers transmitted their orders to a bank and from there it was forwarded to an exchange. With MiFID a legal basis for alternative trading systems was founded. One section was especially far-reaching as well as controversial: internalization. Since MiFID financial service providers did not need to forward their customer's orders to regulated exchange markets, they could legally execute orders outside regulated markets. This could be achieved by using their own internal trading systems or use external alternative trading systems.

This article is dealing with one special variant of alternative trading systems: dark pools. Dark pools are essentially private trading systems in which participants can transact their trades without displaying quotations to the public. They offer a substantial benefit to block traders as they can help to avoid market effects usually caused by big trading volumes. Nevertheless this article shows that the disadvantages of dark pools currently outweigh the advantages. Liquidity in exchange markets is decreasing as well as the quality of price formation. Most of all, the lack of transparency could effect the execution price of the order just to the advantage of the operator of the dark pool. Meanwhile, investigations have detected criminal activities which result in high fines. Further development will depend on the effectiveness of the implementation of new MiFID II standards since 2018 versus tendencies to further deregulate financial markets as stated from the Trump administration.

Keywords: Dark pool, trading, exchange trading, MiFID, Alternative Trading Systems (ATS), financial markets liberalization



1. Introduction

"Welcome to the Shark Pool". This was the title of an article in the NZZ online, a Swiss newspaper.¹ Meanwhile, the umbrella term Alternative Trading Systems (ATS), which includes dark pools, are an established player in the financial markets. This is due to revolutionary developments in exchange trading within the last twenty years. Superficially seen there is and has been trading at the security exchange markets, but there is no constant business model. Permanent phenomena like technical progress, increasing globalization and legal liberalization have literally created a new world.²

Besides the reduction of floor trading a so-called demutualization³ of the exchange markets happened.⁴ The increase of technical possibilities as well as the renunciation of decentralized liquidity providers⁵ resulted in take-overs, restructuring and the emergence of ATS⁶ that are now competing against established exchange centers.⁷

The forerunner for this development in Europe was the European Parliament. They passed the "Markets in Financial Instruments Directive 2004/39/EC" in 2004,⁸ which came into effect in November 2007 in all member states of the European Union.⁹ MiFID changed the execution procedures fundamentally through the implementation of the controversial internalization.¹⁰ Hence, it allowed brokers to execute a client's order internally or outside regulated markets.¹¹

How can this development to be evaluated? Is the term "shark pools", mentioned above, appropriate or are the additional possibilities for the benefit of the market participants prevailing? The research task of this article is to reveal the particular advantages and disadvantages of dark pools. Therefore, the term, different variants, the characteristics of dark pools, and their differences against traditional exchanges will be highlighted in chapter two. Subsequently, chapter three will be about different procedures for placing a securities order and the subsequent reasons for a preferred execution via dark pools through banks. Based on all these preliminary considerations, chapter four will deal with answering the research task and will introduce relevant aspects regarding the evaluation of dark pools from a user's perspective. Finally, chapter five will summarize the findings of this article, including an heuristic outlook for the development of the exchange markets.

2. Dark Pools

This chapter is dedicated to a specific group of ATS, the so-called dark pools. At first, these specific trading systems and their evolutionary history will be explained. Afterwards, specific versions and the differences to classic exchange trading will be distinguished.

2.1 Definition

There is an early definition for ATS from the German administration "Bundesaufsichtsamt für den Wertpapierhandel": An ATS is a company that runs an automated system that matches buy- and sell-interests

¹Cf. Rasch, M., 29 August 2014, web. 21 November 2018, <https://www.nzz.ch/finanzen/willkommen-im-haifischbecken-1.18372665>

²Cf. Nobel, P.: Das Finanzmarktrecht Mitte 2011 bis Mitte 2012, SZW vol. 5, 2012, p. 450 ff.

³ Conversion of the legal form of a company from customer's ownership into a public company.

⁴Cf. Nobel, P.: Das Finanzmarktrecht Mitte 2011 bis Mitte 2012, SZW vol. 5, 2012, p. 450 ff.

⁵ Trading participants who provide liquidity by placing orders within an order book.

⁶ Cf. Nobel, P.: Börsenmigration, in: Strebel-Aerni, B. (ed.): Finanzmärkte – Effizienz und Sicherheit, Zürich 2007, p. 107 ff.; Nobel, P., Zimmermann, H.: Regulierung – Überregulierung – Selbstregulierung, in: Nobel, P.: Aktuelle Rechtsprobleme des Finanz- und Börsenplatzes Schweiz, Bd. 12, Bern 2004, p. 520 ff.; Zimmermann, H.: Effektenhandel im technologischen und regulierten Umbruch, in: Strebel-Aerni B., (ed.), Finanzmärkte im Banne von Big Data, Zürich, 2012, p. 112 ff.

⁷ Cf. Siebeneck C.: Die Sanktionsverfahren der Schweizer Börse, Bern, 2013, p. 21.

⁸ Known colloquially as "MiFID".

⁹Cf. anon., 11 October 2016, web. 21 November 2018, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=URISERV:l24036e>

¹⁰Cf. European Commission, 7 October 2003, web. 21 November 2018, http://europa.eu/rapid/press-release_IP-03-1352_en.htm

¹¹Cf. Commission Regulation (EC) No 1287/2006 Art. 2 Point 8, 10 August 2006, web. 21 November 2018, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006R1287>



without having an exchange license. This happens according to the rules of the operator of the system via irrevocable contracts.¹² ATS include more trading systems than just dark pools. MTF (Multilateral Trading Facilities) can also be subsumed beneath this generic term. MTFs are trading platforms similar to real exchange markets. There are MTFs operated by a financial service provider or a bank (regulated by national financial authorities) and those owned by an exchange market (regulated by exchange market laws).

Dark pools form a subset within the ATS. The SEC describes them as follows, „Dark pools are essentially private trading systems in which participants can transact their trades without displaying quotations to the public. The largest dark pools are sponsored by securities firms primarily to execute the orders of their customers and proprietary orders of the firms.”¹³

The nomenclature of dark pools was peculiarity, because the volumes that were traded on these platforms did not appear in the official price statistics of the National Market System (NMS).¹⁴ Dark Pools are those kind of trading systems within the ATS, where the situation in the order book is not visible for the market participants like with regulated exchange markets. They constitute a complementary market to the regulated market.¹⁵ Security trading on these bank- or exchange-internal trading platforms happens without the required transparency.¹⁶ Besides the missing current order information, the market participants also do not receive information about executed transactions. Thus, big transactions will not influence the course of the trading instrument, unlike with regulated exchange markets. Missing authorization formalities and regulation offices are further elements of those trading platforms.¹⁷ Shortly summarized, the two main characteristics of dark pools are unavailable transparency and absent supervision. The next subchapter will retrace their development.

Until 2007, dark pools were not a significant phenomenon in Europe. Only the introduction of MiFID I as a legal basis enabled the systematic development of a parallel stock exchange landscape.¹⁸ The following analysis of the market structure illustrates the influence of the new legislation on the stock exchange structure. The share weighting of the trading volume in the securities of the German leading index DAX is chosen representatively and analyzed three years before and after the introduction date.

As expected,¹⁹ the share of off-exchange trading activity during the three years prior to MiFID is approximately zero percent. In 2007 a slight increase is immediately measurable and just three years after introduction the share is almost at 10 percent.

The traditional legal structure, according to which each EU member state can issue its own stock exchange guidelines, was abolished by MiFID and replaced by a Europe-wide principle of competition promotion. The constant expansion of dark pools leads to a virtual structural change in the following years and changes the stock market world effectively.

2.2 Different Types of Dark Pools

Dark pools can be subdivided into five different specifications with regard to their characteristics.²⁰ On the basis of this categorization, the objective of the respective trading system can be determined quickly and easily. The classification is based on the following criteria: Ownership, customer/user of the system, price and order determination, liquidity type and level, average trading size, accessibility, partners in liquidity issues, and the way of price indication.

¹² Cf. Bundesaufsichtsamtfür den Wertpapierhandel (BAWe): Jahresbericht 2000, Frankfurt a. M., 2000, S.36 http://www.bafin.de/SharedDocs/Downloads/DE/Jahresbericht/dl_jb_2000_bawe.pdf?__blob=publicationFile, Aufruf am 18.09.16

¹³ Cf. Securities and Exchange Commission (SEC): Issues Proposals to Shed Greater Light on Dark Pools, Washington, D. C., 2009, web. 21 November 2018, <https://www.sec.gov/news/press/2009/2009-223.htm>

¹⁴ Cf. § 242.600 NMS security designation and definitions, as well as § 242.300, web. 21 November 2018, <https://www.law.cornell.edu/cfr/text/17/242.600>

¹⁵ Cf. Carrie, C.: Illuminating the new dark influence on trading and U.S. market structure, in: Journal of Trading Supplement, vol. 3, issue 1, 2008, p. 40-55.

¹⁶ Cf. Securities and Exchange Commission (SEC): Issues Proposals to Shed Greater Light on Dark Pools, Washington, D. C., 2009, web. 21 November 2018, <https://www.sec.gov/news/press/2009/2009-223.htm>

¹⁷ Cf. Gomber, P.: Elektronische Handelssysteme - Innovative Konzepte und Technologien im Wertpapierhandel, Heidelberg, 2000, p. 35.

¹⁸ Abolition of compulsory trading via licenced exchange markets.

¹⁹ Due to lack of legal basis.

²⁰ Cf. Mittal, H.: Are You Playing in a Toxic Dark Pool? A Guide to Preventing Information Leakage, ITG Research, 2008, p. 2 ff.



2.2.1 Public Crossing Networks

In most cases such dark pools²¹ are established by broker agencies. A characteristic of this dark pool category is the economic interest of the operator, which is exclusively focused on the generation of income through commission. Therefore, there is no provision of liquidity on its own and with it no proprietary trading that might cause conflicts of interest with the customers. The business model is aligned exclusively for the settlement of transactions between two external parties (customers).²² Since securities traders always strive for the "best price" (best execution) and are flexible in the choice of their exchange market, the successful operation of such a dark pool variant is to be classified as difficult. The greatest challenge is the permanent provision of the necessary liquidity, which is also the main reason for the low number of new companies. The majority of these ATS are continuous dark pools. This means that client orders are matched directly and immediately without displaying those trading interests.²³

2.2.2 Internalization Pools

As can be deduced from the name, the main objective of this dark pool category is the internalization of client orders. In this area, Goldman Sachs can be regarded as a pioneer with its trading system "Sigma X", shortly thereafter followed by many well-known financial institutions.²⁴ Originally, the focus was on cost reduction via in-house processing of client orders, but shortly afterwards trading for own accounts became a central component of the trading systems. Here, banks act as counterparties as per own-name transactions. This fact played a decisive role in the expansion of this dark pool variant. Another essential motive for banks to establish such trading systems is the overall control over their own trading platform and the associated ability to control transactions. Contact with other players on the market could be adjusted at will. "Internalization pools differ from public crossing networks in that they can contain the operator's proprietary flow beyond just the flow from their retail customers and agency flow from their institutional customers."²⁵ There is one thing in common with regard to the liquidity required. In both cases, a high degree of liquidity is decisive for the economic success of the trading system. However, there are considerable differences in the type of attainment. While public crossing networks depend on external participants, internalization pools, comparable to a market maker, provide liquidity by themselves. In addition, cooperation agreements are maintained with special market participants, so-called liquidity partners. Those partners are granted special advantages.²⁶ Due to this special position, liquidity partners have an information advantage over regular market participants.²⁷

2.2.3 Ping Destination

Operators of ping destinations²⁸ are usually hedge funds or electronic market makers. This category is limited exclusively to the transaction activity between the operator and the customer. Inter-customer transactions²⁹ are not foreseen in this type of trading platform. Another feature is the missing possibility to place orders in the system on a long-term basis. The providers solely accept IoC orders, which leads either to a direct execution or to the deletion of the order. Such a rapid order is called "ping", from which the name of this category is derived. The operators use quantitative models that decide automatically whether to accept or reject a customer order. Due to the small scope of action and its fully automatic design, this dark pool variant results in a high level of competitiveness and is the most cost-effective dark pool variant. Not only do customers benefit from extremely

²¹ Representatives of this variant: POSIT, Liquinet, Instinet CBX, cf. Mittal, H.: Are You Playing in a Toxic Dark Pool? A Guide to Preventing Information Leakage, ITG Research, 2008, p. 3.

²² Due to the high dynamics, a future expansion of the business model cannot be ruled out from both a legal and a technical point of view. At present, however, there are no signs of such a renunciation.

²³ Cf. Mittal, H.: Are You Playing in a Toxic Dark Pool? A Guide to Preventing Information Leakage, ITG Research, 2008, p. 3.

²⁴ Ibid, p. 4. Other market actors are Credit Suisse Crossfinder, MSPool, UBS Pin.

²⁵ Ibid, p. 4.

²⁶ E.g.: More detailed trading information, extended insight into the trading system.

²⁷ Cf. Mittal, H.: Are You Playing in a Toxic Dark Pool? A Guide to Preventing Information Leakage, ITG Research, 2008, p. 4.

²⁸ Representatives of this variant: ATD, Citadel, GETCO, cf. Mittal, H.: Are You Playing in a Toxic Dark Pool? A Guide to Preventing Information Leakage, ITG Research, 2008, p. 5.

²⁹ Trade between two external parties.



low transaction costs, they also receive a more advantageous execution price in some cases.³⁰ This is due to the fact that the operator does not necessarily have to execute the mid-point price in contrast to internalization pools. Customer discrimination is subject to the conception of the operator, whereby established trading participants enjoy a strategic advantage.³¹

2.2.4 Exchange Based Pools

Operators of this dark pool class have the primary objective of improving the liquidity of an existing exchange market. This category is subdivided into two varieties: hidden pools³² and registered pools.³³ Hidden pools are liquidity pools created by hidden order types. Registered Pools are types of ATSs that have been registered by the stock exchanges. In both cases, the formation of the execution price is close to the stock exchange. On the one hand it is deviated from the stock exchange price, and on the other hand it is based on the supply/demand principle. A unique feature is the cross-platform combination of opposing orders. Thus, hidden orders are not only matched with each other, but are also executed with regular stock exchange orders.³⁴

2.2.5 Consortium Pools

Consortium Pools³⁵ are independent organizations. In contrast to the previous categories, these dark pools are operated by several owners, usually an association of several institutional traders. They seem like a hybrid of public crossing networks and internalization pools, but with a higher level of transparency.³⁶ Generally, each owner of such consortia conducts his own dark pool and uses the participation exclusively for transactions that cannot be settled via his own trading platform. They are benefiting from the low investment costs and the transaction cost advantage. Brokers thus created a multi-level system of an elitist exchange trading.³⁷

2.3 Distinction from Regulated Stock Exchanges

In order to highlight essential differentiating features between the classic securities trade at regulated stock exchanges and trading on dark pools, essential areas of application of securities trading need to be categorized. The alternatives mentioned within these categories are distinguished from each other. To this end, the areas of regulation, transparency, user groups, pricing, and fee structure are analyzed in more detail.

2.3.1 Regulation

Since the financial crisis of 2008, the legislator has been trying to put in order on the financial markets by means of far-reaching regulations. The financial market crisis reached an extent that effected the real economy considerably. This fact created a climate in which banks are faced with a multitude of new regulatory requirements. Against this background, the creation of a non-regulated area is incomprehensible from the author's point of view. Nevertheless, it is precisely this legal vacuum that forms the basis for the comprehensive emergence of dark pools and is coincidentally the most relevant differentiation criterion between the two categories. Thus, a distinction can be made between regulated and non-regulated trading systems for the further course of work. The exchange laws form the legal basis for transactions in the regulated stock exchange environment, whereas non-regulated trading systems are based on private contracts and general terms and conditions. Accordingly, the market power of banks is reflected in the design of the legal framework. ATS therefore has neither licensing procedures nor effective market surveillance.³⁸ The resulting competitive advantage in terms of infrastructure costs is obvious. In addition, the differentiated regulation of ATS with regard to the respective ownership must be dealt with. While multilateral trading systems of financial institutions are subject e.g. to the German Federal Financial Supervisory Authority (BaFin) and regulated by the lower

³⁰ Compared to bid/ask spreads of other exchanges.

³¹ Cf. Mittal, H.: Are You Playing in a Toxic Dark Pool? A Guide to Preventing Information Leakage, ITG Research, 2008, p. 4 f.

³² Representatives of this variant: ARCA, BATS, Direct Edge, cf. Mittal, H.: Are You Playing in a Toxic Dark Pool? A Guide to Preventing Information Leakage, ITG Research, 2008, p. 5.

³³ Representatives of this variant: ISE Midpoint Match, Nasdaq Cross, NYSEMatchpoint, cf. *ibid.*, p. 5.

³⁴ *Ibid.*, p. 5 f.

³⁵ Representatives of this variant: LEVEL, BIDS, cf. *ibid.*, p. 6.

³⁶ Cf. *ibid.*, p. 6.

³⁷ Cf. *ibid.*, p. 6.

³⁸ Cf. Mühlberg, M. (2004): Alternative Handelssysteme: Katalysator im Umbruch des Wertpapierhandels, Deutsche Bank Research, 2004, p. 2.



requirements of the German Securities Trading Act (WpHG) as well as the EU Securities Services Directive (WpDRL), the same trading systems owned by stock exchanges are subject to the significantly stricter requirements of the Stock Exchange Act and the direct control of the stock exchange supervisory authority.³⁹

2.3.2 Transparency

Derived from different legal background, there are different publication obligations depending on the category. Accordingly, all securities service providers that are subject to the regulations of the German Securities Trading Act (WpHG) must "provide their customers with all appropriate information" pursuant to § 31 (2) no. 2. In comparison with the fully comprehensive regulation by the German Stock Exchange Act (BörsG), the operator has considerable room to maneuver. Thus, the scope and type of information publication as well as the time of publication can be chosen freely. This self-determination option enables the operators of the trading platforms to comply with customer requests for anonymity. The degree of transparency can be controlled according to the customer's wishes. For example, transaction times can be published with a time delay for reasons of (avoiding) price influence.⁴⁰

2.3.3 User Groups

The spectrum of investors can be divided into two groups. On the one hand, we have the group of private investors⁴¹ who are negatively defined by the German legislators (Section 31a (3) WpHG) as: "Private customers within the meaning of this Act are customers who are no professional customers."⁴² On the other hand, we have the group of professional investors⁴³ who are distinguished by sufficient experience, knowledge and expertise.⁴⁴ The decisive factor here is the need for protection of the first group prescribed by law. Private investors are therefore subject to the special regulations of the Investor Protection Act. Due to this fact, they are generally excluded from direct participation in trading in dark pools. The situation is different for professional investors. There are no special protection regulations here. The special requirements of professional investors coincide with the nature of the dark pools: The desire for lack of transparency and anonymity. Thus, in the course of dark pool trading, it can always be assumed that professional investors are involved. It is, so to speak, an elitist exchange market world.

2.3.4 Price Formation

The regulated exchanges are divided into different trading models when it comes to pricing. These models differ in terms of market type, transparency level, order prioritization criteria, pricing rules, and order execution form. In the following, two relevant trading models are discussed using a common classification. The first group comprises the so-called floor exchanges and the second group comprises the electronic trading systems. Both groups differ in their transparency. On the floor exchanges a specialist suggests his willingness to trade by publishing I quotes. In an electronic trading system all open orders are recorded, cumulated and confronted. The resulting order book is published during regular trading hours and is available to prospective traders. This information is referred to as market depth. In contrast to the quotation of the floor exchange, where an auction procedure is used after the order is received, the bid/ask spreads of the electronic trading platforms can be traded directly, because these are binding customer orders.⁴⁵

Dark pools, on the other hand, are characterized by entire lack of transparency. Trading participants have no opportunity to obtain further information about market depth. Information on transactions already carried out is also not accessible. In most cases orders are executed at the so-called midpoint price. This is generated by deriving the corresponding price range of the respective reference exchanges.

³⁹Cf. German Federal Financial Supervisory Authority (BaFin): Stock Exchanges & Markets, 31 January 2018, web. 22 November 2018, https://www.bafin.de/EN/Aufsicht/BoersenMaerkte/boersenmaerkte_artikel_en.html;jsessionid=54EB05304D588BE9103238B2E699E2BD.2_cid381

⁴⁰Cf. German Börsensachverständigenkommission beim Bundesministerium der Finanzen: Empfehlungen zur Regulierung alternativer Handelssysteme, Frankfurt a. M., 2001, p. 11.

⁴¹ Also referred to as retail investors.

⁴² § 31a Abs. 3 WpHG (German).

⁴³ Also referred to as institutional investors, e.g. pension funds.

⁴⁴ Cf. § 31a Abs. 2 WpHG (German).

⁴⁵Cf. Deutsche Börse: Marktmodell Aktien, Frankfurt a. M., 2015, p. 5 ff.

2.3.5. Fee Structure

Dark pools have a considerable competitive advantage in terms of infrastructure costs. In contrast to regulated stock exchanges, there is no obligation to set up a trading monitoring system, to maintain a stock exchange council or to ensure the qualification of its trading participants. As a result, dark pools are highly competitive. Only the high efficiency of the fully automated trading systems on the part of the exchange operators enables them to compete with the structurally lean dark pools.⁴⁶ However, an exact cost and fee analysis is difficult, as ATS operators rarely publish suitable figures. Only the fact that administrative expenses are not necessary, due to the lack of legislation allows the conclusion to be drawn that the fee structure is significantly lower. Furthermore, on the basis of the high technical standards required for this business, a fully automatic, efficient and thus personnel cost-minimized structure can be assumed.

Now as the variants and the characteristics of dark pools are reviewed, the next chapter will explain the different procedures for placing a securities order and thereby will deliver important arguments in order to evaluate dark pools.

3. Process Design

In order to illustrate the different procedures for placing a securities order with regard to the research question of the article, the process before the introduction of internalization is illustrated and compared with the current situation. The knowledge gained is then critically examined and the current market situation discussed.

3.1 Process Organization

During the validity of the ISD and the associated stock exchange obligation, banks were passively involved in a linear process. For their part, there was no way to maneuver that would influence the execution price of a customer order or make internal profits possible. Banks passed on the customer's transaction order unchanged to the stock exchange and booked all associated business processes in the event of execution:

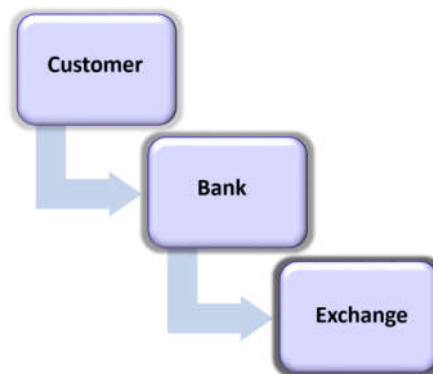


Figure 1: Linear transaction process
Source: own

The Bank's passivity has changed since the abolition of the stock market obligation. Banks have the ability to actively control the execution process by executing customer orders according to their own preferences. The focus is no longer on the service provided to the customer, but on the optimization of the Bank's own business processes.⁴⁷ The Bank has various settlement platforms available for this purpose. Priority is given to internal processing within the bank (internalization). As an option, customer orders can also be processed externally. The customer sends his bank the desired parameters of the transaction to be carried out, whereupon the bank initiates the actively controlled transaction process:

⁴⁶Cf. Accenture: Leaving Safe Havens. The Evolution of the European Stock Exchange Landscape, Sulzbach et al., 2001, p. 18 ff.

⁴⁷E.g. transaction cost optimisation.

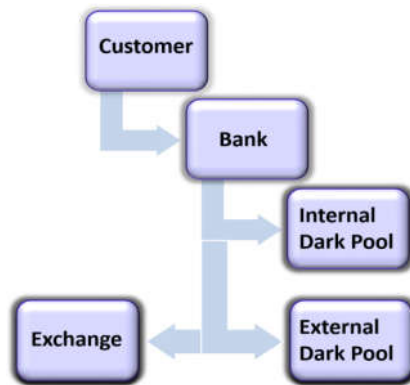


Figure 2: Managed transaction process
 Source: own

In both cases, the customer remains the initiator of the transaction process. However, the bank is changing from a pure service provider to a potential counterparty.⁴⁸ While the linear transaction process automatically gives the customer the security of having received the current market price at the time of execution, this is not guaranteed in the case of execution via the actively controlled transaction process. Banks prioritize the most cost-effective settlement, resulting in the following ranking: 1. Internal dark pool. 2. External dark pool. 3. Exchange markets. The following chapter will illustrate the negative economic consequences of an actively controlled transaction process for the customers.

3.2 Illustration and Theoretical Background

Basic data of the example:

The client (principal) instructs his bank (agent) to buy 2,000 Deutsche Bank shares with a limit of EUR 12.75. If this data is transferred to a situation in the real order book shown in figure 4, the client receives 2,000 Deutsche Bank shares for EUR 24,935⁴⁹ plus transaction costs when buying via the stock exchange.

Symbol	Ex...	Bid Size	Bid	Bl...	A...	Ask	Ask Size	Last	Last Size	Phase	Flags	Last Time	Pre	Day Total	ISIN	
DBK.XTR	XTR	4459	12,46	0	0	12,465	1000	12,465	186	TRADE		16:47:11	12,595	3005002	DE0005140008	DEUT
		26566	12,455	1	1	12,47	14957									
		23430	12,45	2	2	12,475	21528									
		34738	12,445	3	3	12,48	25101									
		23891	12,44	4	4	12,485	36291									
		15195	12,435	5	5	12,49	21803									
		10048	12,43	6	6	12,495	17892									
		20191	12,425	7	7	12,50	14508									
		12912	12,42	8	8	12,505	3719									
		1606	12,415	9	9	12,51	5207									

Figure 3: Xetra order book (Deutsche Bank share)

⁴⁸Cf. anon., 30 June 2014, web. 15 November 2018, <https://deutsche-wirtschafts-nachrichten.de/2014/06/30/dark-pools-banken-zocken-mit-dem-geld-der-rentner/>

⁴⁹Calculation: $(1,000 \cdot \text{EUR } 12.465) + (1,000 \cdot \text{EUR } 12.47) = \text{EUR } 24,935$.

This scenario is now contrasted with an off-exchange transaction (internalization) in which the bank may match the order with a pending sales order for 4,000 Deutsche Bank shares with a sell limit of EUR 12.60 in its own dark pool. Since internalization is possible on the basis of the buy limit, the Bank will execute these two orders internally for cost reasons. The buyer will also receive 2,000 Deutsche Bank shares, but now for EUR 25,200⁵⁰ plus transaction costs. The transaction cost optimization of the bank (agent) results in a negative pricedifferential on the client's (principal) side. Due to the daily volatility, such trading differences are difficult for the client to locate. This asymmetry of information (according to principal agent theory⁵¹) enables the bank to take advantage of the situation unilaterally. As illustrated in figure 5 the bank's benefit maximization is based on the client's benefit reduction.⁵²

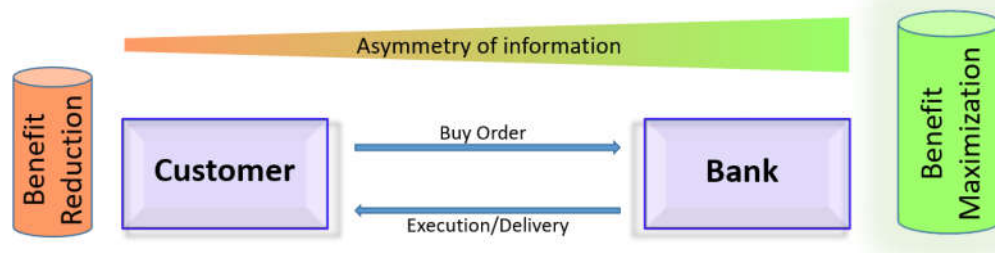


Figure 4: Asymmetry of information
Source: own

The electronic networking between the individual trading platforms is explained in the next chapter.

3.3 Networking of Markets

An essential feature of algorithmic trading is the ability to split orders into several partial orders for distributing them to several stock exchanges on the basis of optimal execution.⁵³ This results in the conclusion of a cross-platform trading network between stock exchange, MTF, and dark pools. Therefore, an electronic exchange of information and orders is assumed. This may be the reason for the rapid growth of the bank's own dark pools. The execution algorithms permanently scan all available trading locations for price, liquidity and potential market impact in order to distribute customer orders.⁵⁴ Lacking liquidity, and thus the need to switch to other trading platforms can be circumvented by a simple mechanism in terms of a permanent connection to other platforms:

⁵⁰ Calculation: $2,000 \cdot \text{EUR } 12.60 = \text{EUR } 25,200$.

⁵¹ Cf. Jensen, M., Meckling, W.: *Theory of the firm. Managerial behavior, agency costs, and ownership structure*, in: *Journal of Financial Economics*, vol.3, no. 4, 1976, p. 305–360.

⁵² Cf. Schwaiger, M., Meyer, A.: *Theorien und Methoden der Betriebswirtschaftslehre – Handbuch für Wissenschaftler und Studierende*, München, 2011, p. 135 ff.

⁵³ Cf. Gsell, M.: *Is Algorithmic Trading distinctively different? Assessing its behavior in comparison to informed, momentum and noise traders*, Universität Frankfurt a. M., working paper 15/2006, 2006, p. 2.

⁵⁴ Cf. Degryse, H., A., et al.: *Shedding Light on Dark Liquidity Pools*, Tilburg Universität, working paper 2008-039, 2008, p. 4.

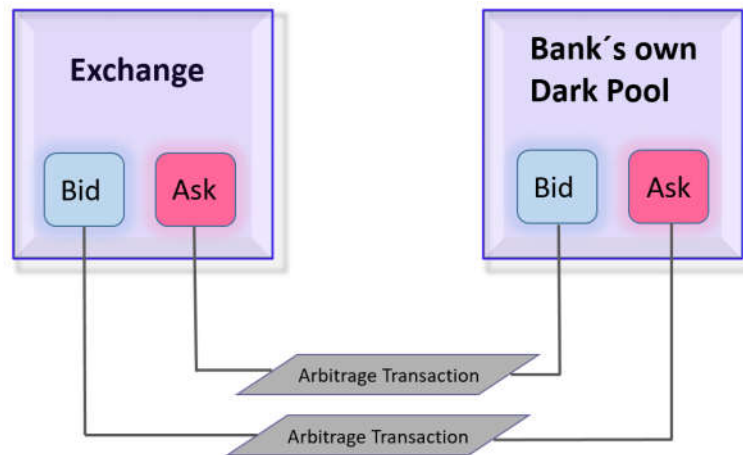


Figure 5: Networking via quote machines⁵⁵
Source: own

Such arbitrage transactions could explain the high execution share of customer-based orders via banks' internal trading platforms. Here the bank is always prepared to process customer orders via its own dark pool as long as another trading system permits an immediate hedging transaction. The amount of the premium, the so-called arbitrage gain, can be determined individually by the bank.⁵⁶ If the limit does not comply with the defined specifications, execution does not take place and the client order remains active in the bank's internal system, depending on the specification.⁵⁷

If the facts described above are combined with the possibility of restricting participants, the result is a profitable and at the same time risk-free business segment. This statement for dark pools can at least be made from a bank's perspective. But how does the evaluation look like from a user's standpoint. The answer to this question and thus to the research task of this article is subject to the next chapter.

4. Evaluation of Dark Pools

The previous chapters have delivered the groundwork that now based on the information provided; an evaluation of dark pools can be compiled.

4.1 Advantages of Use

Large investors in particular benefit from the alternative of non-regulated dark pools. By placing orders anonymously, the effect on the market impact is minimized as other market players are not able to react in good time, e.g. through front-running strategies.⁵⁸ Consequently, larger trading positions can be bought or sold without influencing the market price.

Automated trading algorithms that specifically detect large orders to exploit them profitably can be bypassed by using dark pools. Transaction information can also be treated confidentially, thereby mitigating speculation and possible conclusions.⁵⁹ For example, the complete transaction is only published after a time delay.

⁵⁵ Cf. Gomolka, J.: Algorithmic Trading, Diss. Potsdam University, 2011, p. 85.

⁵⁶ Maybe a fixed percentage difference, e.g. at least 0.1% arbitrage gain.

⁵⁷ Practical example: Sigma X (Goldman Sachs) uses this principle to generate its own trading profits. Criminal case Finra v Goldman Sachs, c.f. anon., 01 July 2014, web 28 September 2016, <https://www.boerse-go.de/nachricht/finra-belegt-dark-pool-von-goldman-mit-800-000-dollar-strafe,a3807296.html#>

⁵⁸ Cf. Hatch, R.: Reforming the Murky Depths of Wall Street: Putting the Spotlight on the Security and Exchange Commission's Regulatory Proposal Concerning Dark Pools of Liquidity, in: The George Washington Law Review, vol. 78, no. 5, 2010, p. 1035.

⁵⁹ Cf. Comerton-Forde, C., Putnins, T., J.: Dark Trading and Price Discovery, in: Journal of Financial Economics, vol. 118, issue 1, 2015, p. 2.



Dark pool transactions often involve position sizes that are difficult to place within a transparent market because high order volumes cause significant price changes. Dark pools thus provide an additional source of liquidity for elite market players that can be used by means of computerized trading systems and programmed trading strategies.⁶⁰

Pursuant to § 13 and § 24 BörsG, stock exchanges may publish transactions with a delay according to the special needs of block traders. In practice, however, block traders do not resort to this possibility, but continue to carry out block transactions over-the-counter. The reason for this is simpler handling. While settlement via a regular stock exchange requires the request of special regulations, off-exchange settlement is completely free of regulations.⁶¹

Another incentive point for using dark pools is the advantageous transaction cost structure. Transactions that will be settled via dark pool platforms offer significant cost advantages over exchange-based settlements. This monetary advantage is primarily due to the leaner infrastructure of the dark pool platforms, which can mainly be realized by the absence of reporting obligations.⁶²

Growing competition generally leads to quality and price competition, which provides customers with further advantages.⁶³ So in theory, the use of dark pools and the resulting cost advantages could also benefit small investors in their fund management.⁶⁴

4.2 Disadvantages of Use

The increasing number of off-exchange securities transactions, triggered by the legal basis for the configuration of ATS, induces a problem not only for stock exchanges and their operators, but also for the entire financial system. Stock exchanges are losing market shares and the resulting fragmentation of liquidity is worsening the pricing quality of the market.

In its function as a macroeconomic institute, the stock exchange essentially fulfils two fundamental tasks. First, the centralization of trading interests leads to a liquid market. Secondly, in addition to the valuation function,⁶⁵ the price determination acts as an indicator for further macroeconomic and business transactions.⁶⁶ This traditional function of the stock exchange is threatened by the increasing off-exchange trading activity.⁶⁷ Due to the total decrease of fragmentation liquidity, a distribution to several marketplaces results in a higher degree of risk. A market-spanning search is more cumbersome, time-consuming, and dependent on the type of market participant, associated with higher costs. To complicate matters, a search across marketplaces can no longer be guaranteed, since some marketplaces do not publish existing trading opportunities or exclude third parties from them.⁶⁸

Furthermore, unlisted securities transactions destabilize the validity of the prices determined on the stock exchange. They no longer include the full range of information⁶⁹ that can be derived from the transactions made. Order fragmentation also hinders the price determination process, since there is no competing behavior appropriate to a price formation competition.

On many trading platforms, only derivative price formation takes place, resulting in the prices determined on regulated exchanges.⁷⁰ Based on parallel price formation processes, no added value can be expected, since

⁶⁰Cf. Zimmermann, H.: Effektenhandel im technologischen und regulierten Umbruch, in: Strebel-Aerni, B. (Hrsg.): Finanzmärkte im Banne von Big Data, Zürich, 2012, p. 115 ff.

⁶¹Cf. Liersch, J.: Nachteile für den Finanzplatz durch außerbörsliche Wertpapiergeschäfte, Johann Wolfgang Goethe Universität Frankfurt a.M., Institut für Bankrecht, working paper no. 109, 2003, p. 7.

⁶²Cf. Degryse, H., A., et al.: Shedding Light on Dark Liquidity Pools, Tilburg Universität, working paper 2008-039, 2008, p. 2.

⁶³E.g. more favourable conditions or special services to distinguish from competitors.

⁶⁴In practice, this development is rather unlikely. Kickback payments, so-called retrocessions, are common practice and are contrary to the above-mentioned assumption.

⁶⁵The price of a security formed by supply and demand serves interested parties as a reference point for possible trading decisions.

⁶⁶E.g. risk assessment and the resulting discount rate.

⁶⁷Cf. explanatory statement of the draft of the European Commission COM (2002) 625, p. 11 ff.

⁶⁸Cf. Liersch, J.: Nachteile für den Finanzplatz durch außerbörsliche Wertpapiergeschäfte, Johann Wolfgang Goethe Universität Frankfurt a.M., Institut für Bankrecht, working paper no. 109, 2003, p. 3 f.

⁶⁹Market participants' order embody relevant information, including subjective perception and evaluation.

⁷⁰Cf. Liersch, J.: Nachteile für den Finanzplatz durch außerbörsliche Wertpapiergeschäfte, Johann Wolfgang Goethe Universität Frankfurt a.M., Institut für Bankrecht, working paper no. 109, 2003, p. 5.



finally there can only be one "correct" price for a security and price differences from dual processes converge through arbitrage processes. Only market-dominating players can draw advantages from this.⁷¹ However, the quality of price formation decreases.⁷² The new version of § 24 par. 2 BörsG194 in Germany cushions the symptoms, but does not eliminate the cause. This possibility is basically not applied in everyday business.⁷³ The negative effect is only offset by the cost advantage of competition.⁷⁴

There are two opposing approaches: The stock exchange with a multitude of imposed transparency regulations and off-exchange trading with a maximum lack of transparency. The negative effects on pricing quality were adequately explained. The question then remains, which kind of trading participants prefer an unregulated trading environment (lack of transparency)? On the one hand, there are so-called block traders who trigger a market effect⁷⁵ due to their enormous trading volumes. On the other hand, there is the group of insiders who generate profit on the basis of information advantages. While the first category is granted a certain degree of lack of transparency by the legislator, the second category is considered insider trading and as such a criminal offence according to § 14 WpHG.⁷⁶

OTC transactions are not public and therefore constitute potential insider facts.⁷⁷ If other market players do not have any information about the transactions and their associated information, this constitutes a "not publicly known fact" pursuant to section 13 WpHG.⁷⁸ In this way, market participants who dispose of this knowledge become insider in a juridical meaning.⁷⁹ If pricing impact is assumed for the transaction,⁸⁰ this knowledge puts traders in an advantageous position, since the future price development can be estimated on the basis of the information advantage. Thus, the lack of transparency in OTC trading not only creates an improved framework for concealing block trades, but also creates additional risks for further insider trading. Once again, this raises the question of the actual objective on the part of the legislator.⁸¹

Independent from illegal insider trading it was shown by Mittal⁸² that there is information leakage in conjunction with dark pools. He identified three resulting effects on consumer's order execution: price impact, gaming and adverse selection.⁸³ Each of them is supposed to adversely effect the execution or the execution price of a consumer's order.

The change in the market structure triggered by MiFID was significant. After MiFID there were no major benefits besides block trading but serious disadvantages. The introduction of internalization, which the banking lobby in particular attached particular importance to when preparing for MiFID I, and the resulting internalization pools are especially criticized for having used a lack of transparency to their own advantage. The growth rate in the area of internalization pools was above average compared to other dark pool characteristics. The deductive conclusion from this is that not the transaction cost advantage, but the additional trade profit optimization brought about the rapid upswing of such dark pool systems. The authorization of banks to manage customer orders independently led to a systematic discrimination against them. Technical possibilities were used to expand their own advantage and to implement an actively controlled transaction process. In the

⁷¹E.g. by an information advantage.

⁷² Cf. Merkt, H.: Kapitalmarktrechtliches Teilgutachten, 64. Deutschen Juristentag Teil F/G: Bd. 1, Berlin, 2002, p. 56.

⁷³ Direct publications are omitted and transactions in direct trading are not taken into account in determining the stock exchange price.

⁷⁴ Cf. explanatory statement of the draft of the European Commission COM (2002) 625, p. 11 ff.

⁷⁵ When executed in a usual way, large orders cause a temporary backlog on the relevant market side which influences the price.

⁷⁶ Repealed by the First Act on the Amendment of Financial Market Regulations based on European Legal Acts (Erstes Finanzmarktnovellierungsgesetz) from 30 June 2016 (BGBl. I p. 1514), in force since 2 July 2016.

⁷⁷ A non-publicly known event that occurs in the sphere of activities of a skillful person and, due to its effects, is likely to influence the stock exchange price of securities.

⁷⁸ Repealed by the First Act on the Amendment of Financial Market Regulations based on European Legal Acts (Erstes Finanzmarktnovellierungsgesetz) from 30 June 2016 (BGBl. I p. 1514), in force since 2 July 2016.

⁷⁹ Vinzant, C.: The New Improved Game of Insider Trading, Fortune Magazin, vol. 139, no. 11, 1999, web: http://archive.fortune.com/magazines/fortune/fortune_archive/1999/06/07/261077/index.htm

⁸⁰ This assumption is conclusive in itself and therefore to be regarded as probable, since otherwise there would be no need for anonymisation on the part of the applicant.

⁸¹ Cf. Liersch, J.: Nachteile für den Finanzplatz durch außerbörsliche Wertpapiergeschäfte, Johann Wolfgang Goethe Universität Frankfurt a.M., Institut für Bankrecht, working paper no. 109, 2003, p. 9.

⁸² Cf. Mittal, p. 10 ff.

⁸³ Cf. Mittal, p. 14 ff.



course of this optimization, established trading strategies were integrated into the company's own trading systems and used profitably against its own customers.

In mid-2014, criminal investigation authorities began to take up this issue and investigate against dark pool operators, in particular banks.⁸⁴The result is a methodological spiral that led to ever deeper insights into business practice and thus to ever higher fines.⁸⁵

During the final chapter the authors will deduce some likely trends for the prospective constitution of exchange market trading, based on the preceding findings and assessments.

5. Outlook

In the mid-eighties there was a fixed structure. Securities were traded on a central trading place - the stock exchange. Transparency, comprehensible pricing, and state supervision to ensure quality and an efficient regulatory framework existed. Since then, progress in information and communication technology has changed a lot. In view of the number of business transactions being carried out today, it is impossible to imagine modern stock exchange trading without the use of technical achievements.

Not only technical progress, but also legal innovations have influenced the capital market. Fundamental or changes in the capital market business are effectuated by changes in the law. In recent years, this legal influence has led, consciously or unconsciously, to a considerable fragmentation of trading liquidity and a significant reduction in transparency. The basis for this fragmentation of trading liquidity is the MiFID directive, which was drawn up in 2004 and also serves as the legal basis for the dark pools maintained by investment banks. The subsequent opaque exchange market landscape created on the basis of the new legal situation was used in particular by banks to optimize their own trading results. This development of dark pools was at first influenced by the intervention of the regulatory authorities. On the one hand, high penalty payments led to a dwindling interest on the part of providers; on the other hand, the legislator began to influence trading activities with detailed regulations (MiFID II). For example, a planned upper limit for the transaction volumes implemented at off-exchange trading venues is to be laid down by law.

Reflecting the steadily rising sanctions imposed on the banks in the course of the investigations into this issue and the efforts of the legislative institutions to reshape the situation, the landscape of dark pools will inevitably change. Especially since investors became increasingly aware of the fraudulent business practices of the dark pool operators, they are no longer willing to trade through them.⁸⁶Nevertheless, the complete disappearance of the established dark pools is highly unlikely. If the level of fines is considered relatively to the potential earnings, the discrepancy is obvious. From the bank's perspective the imposed fines are negligible in contrast to the trading profits generated over almost a decade. Self-criticism on the part of the operators is therefore unlikely.

The loss of confidence on the part of institutional investors will continue, which is likely to lead to a greater focus on bank customers and the associated internalization. At present there is hardly any evidence that banks would stop internalization. The question of how dark pool platforms implement the envisaged upper limit on the part of the legislator (cf. MiFID II) remains open. It would be possible for major investors to return to the regulated stock markets,⁸⁷ whereas retail customers will furthermore be executed internally.

With regard to the stringency of the implementation, the final introduction of the legal basis has to be awaited. Decisive for the legal regulation will be the prevailing mood and the pressure on the legislator to act. The current diversion towards deregulation of the markets is a reoccurring issue, based on President Trump's statements.

⁸⁴Cf. anon.: Hochfrequenzhandel - Deutsche Bank und UBS wegen „Dark Pools“ verklagt, in: Handelsblatt, 09 July 2014, web. 15 November 2018, <http://www.handelsblatt.com/unternehmen/banken-versicherungen/hochfrequenzhandel-deutsche-bank-und-ubs-wegen-dark-pools-verklagt/10262738.html>

⁸⁵Cf. anon., 01 July 2014, web. 28 September 2016, <https://www.boerse-go.de/nachricht/finra-belegt-dark-pool-von-goldman-mit-800-000-dollar-strafe,a3807296.html#>; anon., 01 February 2016, web. 15 November 2018, <http://www.tagesanzeiger.ch/wirtschaft/unternehmen-und-konjunktur/credit-suisse-zahlt-millionenbusse-wegen-dark-pools/story/14381198>; anon., 27 June 2014, web. 15 November 2018; http://www.aktiencheck.de/exklusiv/DAX_100-Deutsche_Bank_Aktie_Licht_geht_aus_Dark_Pool_Bankenskandal_bringt_neue_Risiken-5794616

⁸⁶ Cf. anon., 25 April 2015, web. 15. November 2018, <http://www.handelsblatt.com/finanzen/anlagestrategie/trends/grauer-markt-norwegischer-staatsfonds-will-weniger-dark-pools-/11684570.htm>

⁸⁷Incentives for this could be the introduction of a new order type or the delayed publication of transactions.



Accordingly, an abolition of the restrictions based on the Dodd-Frank Act⁸⁸ seems to be likely. This may also influence legislation in Europe and lead to a dilution of the intended influence.

⁸⁸Law in force since July 2010 to promote the stability of the financial market by improving accountability and transparency in the financial system. C.f. Hamilton, J., Dexheimer, E., 10 November 2016, web. 15 November 2018, <http://www.bloomberg.com/news/articles/2016-11-10/trump-s-transition-team-pledges-to-dismantle-dodd-frank-act>