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Swiss bond trading report 2018

The evolution of bond markets and an outside-in view on Swiss investors

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Preface

Bond markets have evolved considerably in the last two decades. Traditionally, bond markets have been a combination of a decentralised market structure with dealers at its core, providing voice-based market-making to a fragmented, relationship-based network of clients, and an interconnected inter-dealer market allowing dealers to source liquidity. This historically evolved market structure experienced a major shift before the turn of the 21st century with the introduction and adoption of electronic trading platforms and the subsequent rise of electronic trading. Since then, technological innovations have progressed and fundamentally changed the way market participants interact with each other. Nowadays, market players are increasingly interconnected, trading is progressively technology-driven and the traditional roles between investors and dealers are blurring. Moreover, ongoing regulatory initiatives are enhancing market transparency and contribute to an environment in which the processing of data and market information are playing an ever more important role. As a result, bond markets have reached a degree of complexity that investors are hardly able to handle without the appropriate technology in place. In short: Today, technology is key to efficiently detect, aggregate and trade liquidity.

This report analyses these developments in detail, describes the accompanying technological innovations and argues why the adoption of technologies are of paramount importance for investors. Moreover, the purpose of this publication is to illustrate the progress of Swiss market participants with respect to the adoption of these technologies. Given that Swiss market players are often overshadowed by the larger players in the US and the UK, this study particularly focuses on Swiss investors and evaluates their trading behaviour on a global scale. Analysing the level of technological adoption among Swiss-based investors is important for various reasons: First, technology enables market participants to handle trades more efficiently through an order's life cycle. Second, technological innovations are viable sources of liquidity and are able to improve prices and reduce costs for transacting bonds. Therefore, the level of technological adoption is an important driver to reduce trading frictions in capital markets and thus contribute to economic welfare. As a result, understanding the status quo of bond trading in Switzerland is of general economic interest.

The following report is divided into two parts and combines a description of the evolution of bond markets with an examination of the trading habits of Swiss-based investors:

Part I describes the formation of today's bond market structure based on the three dimensions «organisation», «technology» and «environment». In this part, we analyse the historical organisational structure of bond markets, elaborate the effects of technological innovations on these markets and describe the environment surrounding the market in Switzerland from a legal perspective.

Part II of the report takes an outside-in view on Swiss market participants and illustrates how advanced Swiss-based investors are in adopting technological trading innovations. This part is based on a survey among 320 Swiss market participants (e.g. banks, securities dealers, asset managers). 112 companies participated in the questionnaire – this represents approximately one-

third of all Swiss-based investors active in bond trading. We analyse how local investors are nowadays trading bonds, describe how advanced these firms are in adopting technological trading innovations and elaborate on the associated effects on market liquidity. Moreover, we also describe the dissemination of the various trading platforms and show, which platforms local investors are planning to introduce in future.

At this point, we would like to thank all parties that made this report possible. Our special thanks go to the sponsors of this report *Diem Client Partner AG* and *Saxo Bank (Schweiz) AG*, who supported this publication with a generous contribution. Additionally, we express our appreciation to the companies that participated in the survey. Finally, our thanks go to our guest author Dr. Martin Liebi, PwC Legal Zurich.

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1 The microstructure of bond markets

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Financial markets aggregate and allocate resources and risks in time and space. In order to fulfil this role as efficiently as possible, one should understand how these markets are organised and regulated. Moreover, it is important to understand the price mechanism and know how trades are executed. Eventually, one should think about the question of how market organisation affects the process of price formation. These questions are the extensive subject of a field of research called market microstructure.[1]

Part I of this report describes the microstructure of bond markets and explains the evolutionary developments that have re-shaped this market in the last two decades. For this, we first outline the methodology that we use to describe the structure of bond markets. Secondly, based on this framework, we analyse the historical organisation of bond markets. This includes a description of the economic role of bond markets, an explanation of the importance of well-functioning secondary markets, an assessment of the structural elements interfering with these markets and an explanation of the historical reliance on certain market participants. The third section elaborates on the effects of technological innovations that have changed this traditional market organisation. This includes a description of the evolving landscape of electronic trading platforms, an explanation for the subsequent change of market participants' trading behaviour and a justification for the increasing importance of data and market intelligence solutions in today's bond markets. The fourth section of part I describes the legal environment surrounding Swiss market players.

1.1 The TOE-framework

This chapter outlines the methodology and the framework used to describe the structure of bond markets. Since the current market design has considerably evolved over the last two decades, the use of a conceptual framework helps to determine the forces that have been transforming the market's organisational structure. A structural framework is able to categorise these trends and increases the understanding of the effects they have on the microstructure of bond markets. The following report bases its analysis on the Technology-Organisation-Environment (TOE) framework.

The TOE-approach, developed by DePietro et al. (1990), is a framework which seeks to determine the factors that drive the adoption of technological innovations. DePietro et al. identify three aspects by which firms adopt and implement technological innovations. This adoption process is influenced by

- the technological context,
- the organisational context and
- the environmental context.

Depending on these three elements, firms see a respective level of necessity for adopting new technologies. The TOE-framework has enjoyed great empirical research attention over the last

1 Cf. Flögel (2006), p. 1.

two decades.[2] Figure 1 shows the three contextual segments that drive the adoption of technological innovations or the likelihood of adoption by firms. The centric turning arrows depict the mutual influence the three areas have on each other.

The TOE-framework is typically applied on a firm- or organisation-level from an inside and outside perspective. This means that technological innovation decision making depends on internal (e.g. company size and scope, degree of centralisation, human resources) as well as external characteristics (e.g. industry characteristics, external regulation). For the purpose of this study, we use the framework to describe the bond market's evolution based on the three elements defined by DePietro et al. (1990).

Figure 1: **The TOE-framework**
(derived from DePietro et al. (1990))

1.2 Organisation: The traditional structure of bond markets

Bond markets play an important economic function in bringing together investors (e.g. pension funds, private investors) looking to earn returns on their investments on the one hand, and organisations (e.g. corporations, governments), striving for capital to fund their businesses on the other. This economic function makes bond markets indispensable in the efficient allocation of financial resources. As a result, bond markets enable economic growth by facilitating productivity and employment. Therefore, a high level of stability in these markets is essential for economic prosperity.[3]

In general, organisations seeking to raise capital have different possibilities to acquire their funds. Probably one of the most obvious options is to request direct funding from a bank. The bank grants a loan to the borrower, the debtor pays an interest rate agreed on and at maturity, the loan is either repaid or renewed. In this case, the bank bears the entire risk, and the debtor deals with one single counterparty. Alternatively, institutions can issue debt instruments and sell these securities on the capital market to a broad range of investors. This leads to greater diversification of the sources of funding, and the risk is spread across many counterparties. In this case, the organisation seeking capital issues a security in the *primary market* to investors. Once the instrument has been sold to the investor base, further trading of the securities is conducted on the *secondary market*.

1.2.1 The importance of stable secondary markets

From an investor's perspective, the secondary market is of particular interest. First, it enables investors to trade existing assets, which they may have previously bought on the primary market. This allows lenders of capital to directly manage and allocate their risk according to their preferences. Second, it is a source of new investment opportunities and a possibility to take

[2] For a selection of applications, see Dwivedi, Wade et al. (2012), p. 164-166.

[3] Cf. ICMA (2016), p. 3.

on risks that may have not been available for certain investors on the primary market. The motives for investors to adjust their portfolios and to step into the secondary market are manifold: Requirements to meet certain liabilities, changing risk appetite or capital flows are only a variety of reasons. To realise these needs, investors use the secondary market to facilitate required sales and purchases of securities. As such, the secondary market empowers investors to efficiently allocate their financial resources.

Coinciding with the benefits for investors, one can raise the question as to why issuers of debt instruments need the secondary market. A key consideration for organisations issuing bonds are the costs of borrowing. Thus, it is essential for issuers to determine the price of a bond in the primary market correctly. If the issuance price is too low, the organisation pays a higher interest rate than necessary, if the price is set too high, investors will not buy the bond and the issuer may not receive sufficient capital. Therefore, it is critical for issuers to optimally price their bonds to clear at issuance. In practice, an important benchmark for guidance is the current (secondary) market price of previously issued instruments or comparable securities. A liquid[4] and stable secondary market significantly helps to assess and impose appropriate pricing levels. Furthermore, the security of a well-functioning secondary market potentially leads investors to more confident bids and thus to better borrowing conditions for issuers. This is because investors factor lower liquidity premia into the issuance price if they have the opportunity to sell the bond at (any) future date. Therefore, frictionless secondary markets improve the pricing conditions for issuers of debt instruments.[5]

Box 1: Definition of market liquidity

Reviewing recent research activities and literature made clear that there is no single standardised measure and commonly valid definition of «market liquidity». For the purpose of this report, the definition from the International Capital Market Association (ICMA) is used to define market liquidity. ICMA defines market liquidity as «*the ability to execute buy or sell orders, when you want, in the size you want, without causing a significant impact on the market price*».

Source: ICMA (2016), p. 11.

Issuers of bonds are typically governments or corporations. Box 2 describes the corporate bond markets in the United States and Europe – the two largest corporate bond markets in the world making up nearly 70 percent of the global market. In both regions, bond markets are an important source of capital for corporations. The USD-denominated corporate bond market is the largest in the world with USD 11.4 trillion in outstanding bonds, followed by the EUR-market with a size of USD 7.9 trillion. However, the USD-market is not only substantially larger in absolute terms (by approximately 45 percent), but it also possesses a higher degree of economic importance. For instance, measured as a percentage of GDP, the value of the European (non-financial) corporate bond market only represents one third of that in the United States – i.e. 12 percent of GDP in Europe versus 31 percent in the US. This means that European companies rely more on the banking sector as a source of funding in comparison to firms in the US, where the capital market is more mature.

4 See box 1 for a definition of market liquidity.

5 Cf. ICMA (2016), p. 10.

Box 2: Corporate bond markets: US vs. Europe

- The size of the global corporate bond market is estimated to be USD 28.4 trillion (this includes app. USD 14 trillion in non-financial corporate bonds)*
- The USD corporate bond market is the largest with an outstanding size of USD 11.4 trillion (this includes USD 7.1 trillion in non-financial corporate bonds)*
- The EUR corporate bond market is the second largest with USD 7.9 trillion (this includes USD 3.9 trillion in non-financial corporate bonds)*
- In the US, outstanding non-financial corporate bonds make up around 31 percent of the US GDP, vs. 12 percent in Europe (Q4 2016, residence of issuer in the US/Euro area, all currencies considered)**
- In the US, the ratio of outstanding government debt securities to these corporates is less than 3:1, vs. 6:1 in Europe (Q4 2016)**
- 17 percent of the USD corporate bond issuances are large and thus «liquid» enough to be index eligible, vs. only 3 percent for EUR corporate issuances (indices based on BoAML indices)*

*Source: BlackRock (2016), p. 3-4.
**Source: Database St. Louis Fed, ECB statistics.

1.2.2 The structural elements interfering with bond markets

It is evident that well-functioning secondary markets are important for investors, issuers and economies alike. Market participants have a high interest for bonds to be traded efficiently, timely and with minimal market price impact. However, there are *two* fundamental elements in bond markets that interfere with the efficient trading of bond securities: This is the vast number of available bonds on the one hand, and the decentralised trading of these securities on the other. Both elements are described in the following:

Generally, debt securities are highly customised and thus little standardised. Each bond is typically equipped with company- and sometimes even investor-specific characteristics making bond securities disparate and highly individual. This leads to an investment landscape containing a large number of non-standardised securities. Figure 2 illustrates this by depicting the outstanding bonds of the largest issuers of USD-denominated bonds. The figure lists the issuer's number of outstanding bonds (second column) and the amount of those securities that are due in the next two years (third column). These ten companies collectively have more than 8'000 different bonds outstanding and more than 1'500 of them (≈ 20 percent) are due in the next two years. Even more important is the fact that only a fraction of these bonds (=325 instruments) are qualified as liquid enough to be included in benchmarks such as the Markit iBoxx USD Liquid Investment Grade Index (see fourth column). This means that many of the securities are traded infrequently and suffer from a lack of liquidity. The last bullet point in box 2 further underpins the subdued liquidity for many bonds: For the USD-denominated corporate bond market, only 17 percent of the USD corporate bond issuances are deemed as large and thus liquid enough to be index eligible[6]. This lies in stark contrast to equity markets, where the number of securities is significantly lower as companies normally only issue one common equity security. Moreover, in equity markets demand and supply are centrally

Name of issuer	Number of bonds outstanding	Bonds due by 2019	Bonds in iBoxx USD Liquid IG Index ↓
AT&T	149	17	44
JPMorgan Chase	1'606	350	36
Bank of America	776	161	36
Citigroup	1'701	366	35
Goldman Sachs	2'077	300	31
Microsoft	46	7	31
Verizon	126	7	30
Apple	73	14	30
Wells Fargo	453	60	27
Morgan Stanley	1'172	277	25
Total	**8'179**	**1'559**	**325**

Figure 2: **Outstanding USD-denominated securities of top IG issuers**
(Source: Bloomberg and Markit iBoxx, as per October 2017. The figure shows issuers with the largest notional amount outstanding in the Markit iBoxx USD Liquid Investment Grade Index)

[6] Based on BoAML indices.

assembled at exchanges which increases trading efficiency.[7]

This lack of centralised trading is the *second* fundamental element interfering with the efficiency of bond markets: The secondary bond market is traditionally characterised by a decentralised trading structure. This means that bonds are usually not traded on central market places bringing together demand and supply – as is the case with equities – but trading rather relies upon the intermediation of market makers (e.g. banks, dealers). This has led to a traditional market organisation where bond trading is organised around dealers and their networks of clients. Figure 3 illustrates this historical market organisation with dealers at its core. A reason for this bilateral and opaque market structure is the lack of sufficient liquidity of many corporate and sovereign bonds. Trading illiquid bonds – especially in large-order tickets (or block trades) – requires execution strategies that protect investors from information leakage and possible market impacts.

1.2.3 The historical reliance on dealers

In this market organisation, agreements on trading conditions (e.g. price, size) are made based on bilateral consent and trades are typically executed over-the-counter (OTC) directly between two parties. Traditionally, these off-exchange-driven transactions were dominated – and largely still are – by voice-based negotiations. In this market design, securities dealers play a central role in the distribution and allocation of bonds: They traditionally provide prices to investors, regardless of whether they are able to find an immediate opposite counterparty selling or buying at the same time. This task of matching supply and demand is typically performed by banks and trading firms. In this traditional, quote-driven setting, investors are liquidity-takers; banks and dealers are liquidity-providers. It is important to understand that this market design of (expensive) dealer-intermediation requires significant search costs – especially for investors, looking to find opposite counterparties for their trading intentions.[8]

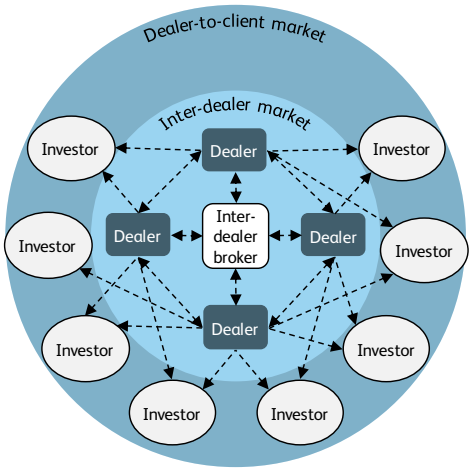

Figure 3: Traditional bond market structure with dealers at its core (→ Price-taker; ← Price-maker)
(Source: Own figure)

Figure 3 illustrates this historical market setting: Bond markets have been characterised by the separation into the inter-dealer market, where dealers trade with each other, and the dealer-to-client market, in which dealers trade with their clients. Investors typically do not trade directly with each other. The transfer of risks from one investor to another typically happens via the inter-dealer market. In the inter-dealer market, dealers usually trade either bilaterally or multilaterally via inter-dealer brokers. Transaction details are normally only known to the involved counterparties, information is not spread to the

7 See BlackRock (2014), p. 4. Further: Rochet and Tirole (2006) suggest that the concentration of trades at one place reduces search costs and increases competition over price.

8 See Duffie (2012).

wider investing public and quoted prices only apply to the respective counterparty. This decentralised, and to some extent non-transparent trading environment – where market information is largely controlled by dealers – makes it difficult for investors to heat up competition for a trade since trading mainly takes place bilaterally over the phone. This decentralised, OTC-driven market organisation is responsible that bond trading is opaque, meaning that prices for the same bond at the same time can vary greatly across dealers.[9]

Since dealers and their market-making activities play an essential role in allocating bonds and intermediating trades, box 3 explains how trading departments are embedded in a banking organisation. The box sheds some light on the possibilities dealers have to intermediate a trade (principal- vs. agency-trading) and illustrates how trading and inventory risks can be managed.

Box 3: Agency- vs. principal-trading and the possibilities to hedge trading and inventory risks

Dealers do not always bear the risks for the positions they are trading. This is namely the case for trades where dealers execute orders for investors by acting as the sole agent and thus acting as an intermediary between the buyer and the seller (agency-trading). Under these terms, market-makers do not take on any market risks but simply mediate the trade between two counterparties – the intermediary earns an agency-fee. One the other hand, dealers can execute trades by using their own inventory (principal-trading). Under these conditions, banks or trading firms take on risks and commit their own capital. In exchange, they expect to earn a return for bearing the inventory risk. But even when bonds are traded on a principal-basis, dealers try to hedge their positions or search for possibilities to cover the risks. Therefore, market-makers are typically connected to repo, derivatives, other market-making, syndication and proprietary trading desks in order to have access to instruments to hedge or unload risk positons. Figure 4 illustrates this functional embedding into a banking organisation.

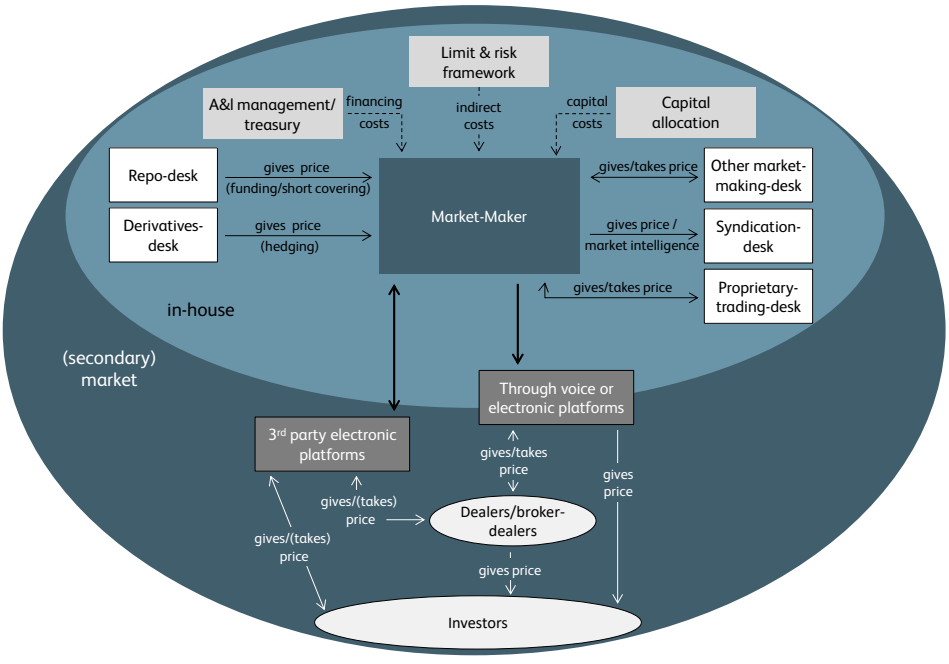

Figure 4: **Market-making – in-house and market-interlinkages**
(derived from CGFS (2014), p. 7)

9 Cf. BIS Markets Committee (2016), p. 4-5.

In summary, bond markets have historically been a combination of a decentralised market structure with dealers at its core, providing voice-based market-making to a fragmented, relationship-based network of clients, and an interconnected inter-dealer market allowing dealers to source liquidity bilaterally or through inter-dealer brokers. Intermediation between clients was practically non-existent. This traditional market design experienced a major shift before the turn of the century with the introduction and adoption of electronic trading platforms and the subsequent rise of electronic trading. The growing implementation of technology was – and presumably still is – strongly responsible for the transformational re-shaping of bond markets over the last two decades and stood largely at the beginning of today's organisational market structure. This technological evolution is the subject of the following chapter.

1.3 Technology: The evolution of electronic trading

1.3.1 What is «electronic trading» and what are «electronic trading platforms»?

A trade typically consists of a variety of activities, which make up a trade's life cycle. But what exactly do we mean, when we talk about «an electronic trade»? The present report uses a definition from a study conducted by the BIS Markets Committees on electronic trading in fixed income markets (see box 4). This definition is essential in order to properly understand the term «electronic trading» as opposed to its antonym expression, «voice-based trading».

Box 4: Definition of the term «electronic trading»

According to the BIS Markets Committee, «*electronic trading refers to the transfer of ownership of a financial instrument whereby the matching of the two counterparties in the negotiation or execution phase of the trade occurs through an electronic system*».

Source: BIS Markets Committee (2016), p. 4.

According to this definition (see box 4), the term «electronic trading» encompasses trades conducted in systems such as electronic communication networks or electronic trading platforms. In addition to this, it includes trades where the quotation of prices or the dissemination of trade requests occur electronically. Moreover, the term covers trades where the settlement mechanism is electronic. This means that trades negotiated by «voice» but executed and settled electronically also qualify as electronic trades.[10]

The term «electronic trading» is closely linked to «electronic trading platforms» since the latter compellingly leads to the former. But how is an «electronic trading platform» defined? The present report differentiates between electronic trading systems (ETS) and electronic trading platforms (ETP) – see box 5. According to this definition, an ETP – alternatively also known as electronic trading venue – is a subset of an ETS.

A widely discussed objective in practice is the level of electronification in bond trading. It is important to note that the state of electronic trading varies significantly among the different segments of fixed income trading – see box 6. For instance, the level of electronic trading is higher in more standardised and liquid bonds, as well as in lower-sized trades. Moreover, more recently issued bonds see a higher degree of electronic trading: For instance, on-the-run US Treasuries are not only more liquid but are also traded electronically more

[10] Cf. BIS Markets Committee (2016), p. 4.

Box 5: «Electronic trading systems» (ETS) vs. «electronic trading platforms» (ETP)

An ETS is a facility that provides some or all of the following services electronically:

(i) information processing of market liquidity (sourcing, aggregating);
(ii) order routing (delivery of orders to execution system);
(iii) order execution (transforming orders into trades);
(iv) credit risk management (central counterparty trading);
(v) automated trade settlement (straight-through processing); and
(vi) dissemination of trade-information (pre- and post-trade)

On the other hand, an ETP (or electronic trading venue) is an electronic trading system that provides a matching and execution engine to pair buyers and sellers and which facilities trading between parties. An ETP requires market regulation defining who can access the ETP, which instruments can be traded under which trading rules. Accordingly, an ETP is a subset of an ETS.

Derived from Gemloc, World Bank (2013), p. 9.

often than off-the-run US Treasury bonds. In addition, the share of electronic trading varies greatly across different reports since the methodologies for measuring the state of electronification differ. For instance, calculating the share of electronic trading by volume – and not by number of trades as in box 6 – leads to a lower penetration of electronic trading.[11] This is because large-order trades are more often traded non-electronically compared to smaller-sized trades. A reason for this is that block-trades can have adverse market impacts, which induces market-participants to trade such orders preferably and more often by «voice-based trading» via phone.

Box 6: State of electronification in fixed income trading

- The level of electronification in fixed income trading varies significantly among segments
- Electronic trading is more advanced in standardised and more liquid markets
- Fully or significantly electronic:
  - Fixed income futures: ~90 percent*
  - US Treasuries: ~70 percent
  - European government bonds: ~60 percent
  - Agency bonds: ~50 percent
- Voice-driven or on the way to becoming electronic:
  - Investment grade cash bonds: ~40 percent*
  - High-yield cash bonds: ~25 percent
- The level of electronic trading also depends on trade sizes: E.g. 85 percent of electronic trades in corporate bonds are lower than USD 1 million in notional value

*Share of trades occurring electronically, per 2015.

Source: BIS Markets Committee (2016), p. 9.

1.3.2 Electronic trading in the inter-dealer market

Bond markets faced a major shift towards electronic trading when electronic communication networks (ECNs) started to gain traction before the turn of the century. The Securities and Exchange Commission (SEC) defines ECNs as «electronic trading systems that automatically match buy and sell orders at specified prices».[12] In the beginning, ECNs were mainly used in the inter-dealer market where they were operating as centralised marketplaces aggregating trading orders and matching and executing these against trade requests. In contrast to the quote-driven dealer-to-client market – where prices are offered on a request-for-quote basis (RFQ) – ECNs are order-driven. They primarily use central-limit-order-books (CLOB) showing bid and offer prices from all market participants.

A key advantage of ECNs at the time was the increased pre-trade market transparency allowing ECN members to view the set of orders at which

11 For instance, Oliver Wyman and Morgan Stanley (2015) quantify the level of electronic trading of sovereign bonds between 50-60 percent and corporate bonds between 15-20 percent – measured in volume-terms.

12 http://www.sec.gov/divisions/marketreg/mrecn.shtml

one could execute trades. Even the post-trade market transparency improved as prices and volumes were often disseminated after the execution of a trade. In addition, ECNs allow for straight through processing of these trades, meaning that orders are automatically processed and cleared.

One of the first ECNs introduced in the United States was eSpeed[13] (founded by Cantor Fitzgerald) and BrokerTec[14] (launched by a consortium of Wall Street Banks) in 1999. In Europe, EuroMTS[15] was introduced in 1998 for trading European sovereign bonds.

The adoption of electronic trading first took place in the US Treasury market – and this at a rapid pace: Dupont and Sack (1999) assume that the share of electronic trading in total trading activities in the US Treasury market was between two and four percent in 1999. Six years later, the picture had significantly changed. Mizrach and Neely (2006) consider that the trading of on-the-run US benchmark treasuries was largely commoditised in 2005 and almost all trading activities migrated to electronic trading platforms. The electronic trading market was dominated by the two electronic trading venues from eSpeed and BrokerTec. Mizrach and Neely (2006) estimate a market share in on-the-run Treasury securities for BrokerTec and eSpeed of 61 and 39 percent respectively.[16] As previously described, on- and off-the-run markets differ considerably by trading methods: The share of electronic intermediation falls sharply when securities go off-the-run.[17]

1.3.3 Electronic trading in the dealer-to-client market

Parallel to the rise of electronic trading in the inter-dealer market, there were dynamic technological initiatives to establish electronic trading platforms in the dealer-to-client market. In the late 1990s, electronic dealer-to-client platforms mainly appeared in two forms: Single-dealer (SDP) and multi-dealer platforms (MDP). A SDP is a proprietary technology offered by a single bank to its customers. A SDP provides investors with a single user interface to a bank and essentially delivers an electronic alternative for the traditionally voice-based dealer-to-client interaction to the client. Whereas SDPs only allow clients to trade bilaterally with one single liquidity provider, MDPs allow investors to query orders to multiple dealers electronically.

Therefore, MDPs connect multiple dealers to one platform. Orders or trading requests from investors are routed to auctions in which a variety of dealers competes over prices. At the end of the auction, investors review the dealers' quotes and select the best quote. A key advantage of an MDP is the considerable amount of time saved compared to negotiating a trade bilaterally with the same set of dealers through voice-based communications. More importantly, trading via auctions increases the competition among dealers, resulting in better transaction prices (Hendershott and Madhavan (2015)). As a result, and as shown by Hendershott and Madhavan (2015), electronic trading on MDPs can meaningfully reduce transaction costs in comparison to «voice»-trading. The differences in transaction costs (electronic vs. «voice») is higher, the lower the trade size. Moreover, trading costs in high-yield bonds are higher than in investment-grade bonds. For high-yield bonds, for instance, electronic micro-trades average at 35.9 basis points, while for «voice-based»-trades the costs are substantially higher at 122.0 basis points. The costs fall to 12.7 (electronic) and 16.5 basis points («voice») in

13 Acquired by NASDAQ in 2013 from BGC Partners.
14 Today operated by the NEX Group.
15 Acquired by the London Stock Exchange in 2007.
16 Q3 2005, cf. Mizrach and Neely (2006), p. 528-530.
17 See Barclay et al. (2006).

the round-lot trade size categories, respectively.[18] An additional advantage of an MDP is the automated record keeping of trades that helps to ensure and document the principles of «best execution».

A major landmark in the dealer-to-client market was the launch of Tradeweb in 1998 by Thomson Reuters (major shareholder) along with 11 banks (minority shareholders).[19] Tradeweb served as the banks' trading platform providing liquidity on a multilateral trading basis to investors. At the time, Tradeweb captured approximately 15 percent of the dealer-to-client flow in the US government securities market.[20] Other major MDPs include Bloomberg launched in 1999[21], MarketAxess in 2000 and BondVision[22] in 2001.

Coinciding with the rise of electronic trading platforms and the adoption of electronic trading, the underlying trading conventions evolved as well. Advanced trading protocols allow investors to negotiate trades in a different way than what market participants were used to from the traditional dealer-intermediated market. These protocols typically aim to aggregate liquidity and to facilitate the bi- or multilateral communication of trading intentions. Especially for more illiquid securities, platforms have developed variations of the traditional RFQ-protocol and have blended RFQ- and CLOB-protocols. For instance, there are platforms which

- … allow for anonymous RFQs.
- … guide trading parties into anonymised trading sessions with auctions and/or instant message systems.
- … permit investors and/or dealers to submit indications of interest to dark-pools and receive notice upon a potential trading-match.
- … enable non-dealers and buy-side participants to receive and respond to RFQs and trade with each other (all-to-all trading).

A trading convention which has gained attention more recently is all-to-all trading. Electronic trading platforms offering all-to-all protocols have reported growing trading volumes and market participants have enlarged their commitments on these platforms.[23]

Some of these platforms offer alternative trading protocols that might change the way bonds have been traded in the past. Moreover, there are market participants arguing that all-to-all trading will blur the traditional roles between liquidity-providers (sell-side) and liquidity-takers (buy-side). The following chapter elaborates all-to-all trading in more detail.

1.3.4 All-to-all trading and the blurring lines between liquidity-providers and -takers

All-to-all (A2A) trading is the pure form of multilateral trading. A2A-trading platforms connect dealers, investors and other market participants on a centralised trading venue and allow trading between all platform members, irrespective whether a participant is a buy-side or a sell-side market player. As previously described, most electronic trading platforms have traditionally only allowed for dealer-to-dealer or dealer-to-client intermediation. This changed after the turn of the current decade as major A2A-trading platforms begun to see traction in trading volume. In 2014, 30 percent of

18 See Hendershott and Madhavan (2015), p. 427-428.
19 Cf. BIS Markets Committee (2016), p. 6.
20 Cf. Liebenberg (2002), p. 58.
21 Bloomberg BondTrader (BBT).
22 Merged with BondClick in 2001 and in 2007 acquired by the London Stock Exchange from MTS.
23 For instance: MarketAxess, a major A2A-trading platform, reports a YoY-growth in all-to-all trading volume of 51 percent and an increase of 12 percent of firms acting as price-makers in the third quarter 2017. Cf. MarketAxess (2017).

Box 7: Trading on electronic platforms

- In 2014, the total electronic trading volume was distributed as follows:
  - ~45 percent was traded on D2D-platforms
  - ~30 percent was traded on A2A-platforms
  - ~25 percent was traded on D2C-platforms
- From 2010 to 2014, total electronic trading volume increased significantly: E.g. the average daily trading volume rose by about 40 percent from 2010 to 2014
- The number of transactions, a key indicator of trading activity, also rose over this period: E.g. across all platforms, the number of transactions increased by over 30 percent
- Electronic trading grew most on D2C-platforms: From 2010 to 2014 trading volume increased by ~23 percent

Source: BIS Markets Committee (2016), p. 13.

the total electronic trading volume was traded via A2A-platforms – see box 7.

A market-leading A2A-platform is offered by MarketAxess, which originally debuted in 2000 to provide investors with multi-dealer pricing. In 2012, MarketAxess introduced «Open Trading» allowing investor-to-investor trades. Since then, the platform has further expanded its trading network and has developed new trading protocols. Other market players offering A2A-trading are Tradeweb with their A2A-solution «Blast A2A» (launched in 2017), Liquidnet with their A2A-offering «Liquidnet Fixed Income» (2015), Trumid with their platform «Trumid Market Center» (2016) or Bloomberg with the bond cross function «BBX» (2015).

The exploration of the exact «trigger event» causing A2A-trading platforms to gain traction is multifaceted and has been widely discussed in academic studies and research surveys. A consistent observation is the growing number of buy-side investors that have increased their engagement on A2A-platforms. This leads to the hypothesis that the driving forces behind the growing volumes are buy-side investors. The rationale behind this assumption has a historical background: Back in 2014, BlackRock, the largest independent asset management firm in the world, was actively proclaiming to create more A2A-trading venues in order to facilitate peer-to-peer trading and to enhance the opportunity to uncover latent liquidity. BlackRock encouraged market participants to adopt their trading behaviour and to make greater use of A2A-venues, which would enhance liquidity by enabling greater market connectivity and by matching demand and supply at one central market place.[24] But what led BlackRock, or more generally speaking, the buy-side community, to start «substituting» dealer-intermediated trading with A2A-platforms? A key argument, among others, are the decreasing levels of bond market liquidity that sell-side firms provide to investors on principal terms. The following arguments have sparked liquidity concerns among the buy-side community, as they justify why banks have decreased their bond inventories[25] and reduced their market-making activities in bond markets:

Onerous regulatory environments: In the aftermath of the financial crisis, regulatory requirements for banks have been increased globally.[26] New regulations have obliged banks to hold more capital, which in turn has limited their capacities – or more precisely, has reduced their incentives – to hold sufficient inventories for their market-making activities. Tighter capital and

24 See BlackRock (2014).

25 According to the Federal Reserve Bank's primary dealer statistics, corporate bond inventory levels have dropped from USD 24 billion (June 2013) to USD 14 billion (December 2017). Since these data are not properly available before 2013, one need to rely on estimates for pre-2013 levels. Goldman Sachs (2014) estimates that the peak of aggregated corporate bond inventories reached USD 38 billion in 2006. This would imply a drop of 60 percent to today's level.

26 General examples are the rulings under Basel III or the regulations under the Dodd-Frank Wall Street Financial Reform and Consumer Protection Act of 2010.

liquidity requirements typically lower the expected returns for market-makers as banks are required to hold more (expensive) capital for trading (risky) assets. As a result, banks have reduced their inventory levels and shrunk their trading departments.

Liquidity harmful market conditions: The expansive monetary policies and the subsequent low interest rate environment have compressed credit spreads globally and market volatility has decreased substantially. This environment creates a variety of negative effects for bond market liquidity: First, very compressed yield levels reduce the incentives for active investors to switch between issues, as the potential financial benefits is low in relative terms. One may even conclude that these market conditions incentivise asset managers to follow a more passive, buy-and-hold strategy. Both arguments have negative impacts on trading activities and thus have an adverse effect on market liquidity. Second, such market characteristics also reduce the encouragement for market-makers to take on inventory risks as the potential returns are weaker. Third, the low interest rate environment has led organisations to issue a large amount of new bonds: Today, the volume and the number of bond issuances has increased significantly and liquidity is spread across a larger number of issuances.[27]

Aggravated risk hedging conditions: Market-makers rely on a well-functioning repo and derivatives market in order to manage and hedge inventory risks.[28] There are various reports stating that the supply of bonds in the repo and securities lending market has diminished significantly. Moreover, surveys among the sell-side community conclude that the single-name CDS market has been in steady decline and is facing a lack of liquidity.[29] A lack of risk hedging opportunities cause dealers to take on less risk which in turn reduces market liquidity.

One can argue that these liquidity harmful conditions have caused investors to look for «alternative» sources of liquidity and encouraged the buy-side community to rely less on dealer-intermediated trading. A2A-trading platforms have addressed these needs and have developed (new) trading protocols to uncover market liquidity. Figure 5 gives an overview of A2A-trading protocols that aim to increase the probability of matching orders or filling indications of interest

	Description
A2A RFQ-systems	A2A RFQ-systems are A2A-trading venues, where multiple parties from both the buy-side and the sell-side are connected and quotes can be requested/sent from/to several different parties electronically. RFQs can be made anonymously or disclosed. This enables the aggregation of some of the fragmented liquidity and supports broader market participation.
Open trading protocols	Open trading systems pool together orders, IOIs and inventories (anonymously or publicly) from all platform members, which enhances liquidity by broadening the universe of potential matches. There are platforms offering both, A2A RFQ-protocols and open trading.
Session-based protocols	Session-based protocols aggregate liquidity in a given security at defined times by announcing a time when certain securities will be traded. Parties interested in buying and selling that particular security will do so at that time, which in turn addresses timing mismatches, where there is no buyer when a market participant wants to sell a security or vice versa.
Crossing systems	Enables anonymous matching of desired buy- and sell-orders using electronic systems, usually executed at a mid-market price.

Figure 5: **A2A-trading protocols**
(derived from BlackRock (2014), p. 2)

27 For instance, the yearly issuing size in US corporate debts has more than doubled from USD 710 billion in 2008 to USD 1'633 billion in 2017. The outstanding size has increased by more than 160 percent. Cf. US bond issuance statistics from Sifma, January 2018, https://www.sifma.org/resources/research/us-corporate-bond-issuance

28 See box 3 where the functional embedding of a market-making desks is explained in more detail.

29 For both statements, refer to ICMA (2016), p. 22-23.

(IOI). An advanced form of A2A-trading is the open trading protocol: This trading protocol allows platform members to state trading intentions (e.g. IOIs, trading axes) in one place – anonymously or publicly. This offers platform members an enhanced pool of additional market liquidity in which they can tap into.

An important effect on the microstructure of bond markets is the fact that platforms have started to settle trades between venue members as a central counterparty. As a result, platform members are able to trade with each other without having a direct relationship. The platform steps between two parties and executes and settles the trade as a central counterparty (back-to-back). The venue serves as the sole intermediary and enables trading between the two counterparties. This interaction among market players would have not been possible in the traditional market setting where investors could only interact with dealers.

But what does this mean, if investors can interact with each other in a way they never have before? Moreover, what is the potential effect if investors can place trading intentions in an unprecedented manner? The effect on the market structure is potentially significant: *First*, it increases the connectivity among market participants (linked through the trading venues), decreases the barriers to trade (due to the intermediation of a central counterparty) and reduces the market fragmentation (because of the centralisation of investors to one place). *Second*, it changes the way buy-side investors have traditionally traded and might alter their trading behaviour. By using open trading protocols, investors have started to provide liquidity to the market and thus act as liquidity-makers for other platform members. More precisely, the progressive establishment of innovative trading protocols has led buy-side investors to react actively on RFQs and have enabled them to use their bond holdings to provide liquidity to other market players and to proactively state their IOIs in the market. This behavioural change is blurring the traditional lines between price-taker and price-maker and thus challenging sell-side firms in their historical role as the sole providers of market liquidity. However, it is important to clarify that being active as a «price-maker» is not the same as being active as a «market-maker» – see box 8.

Box 8: «Price-maker» vs. «market-maker»

A «price-maker» is an investor expressing a price at which he is willing either to buy or to sell a security at a given time (one-sided market). A «market-maker», on the other hand, is a market participant continuously providing a two-sided price at which he is willing to buy and/or to sell a security (two-sided market).

This behavioural change observed in investors can be underpinned by concretes examples: BlackRock, for instance, described in a viewpoint-report that they transact differently in fixed income markets today than they did several years ago. BlackRock has changed its trading behaviour to not just acting as a price-taker but also as a price-maker.[30] Direct results of this behavioural change are the recent collaborations, where large buy-side firms (e.g. BlackRock, AllianceBernstein) have entered into cooperation with the leading A2A-platform MarketAxess.[31] The platform allows investors to step into the market if they see dislocations. The activities on MarketAxess indicate that the buy-side community is making more and more use of it: For instance, in the first quarter of 2017, the number of liquidity providers on MarketAxess' «Open Trading»-protocol rose to 672 – this number has more than tripled over the last two

30 Cf. BlackRock (2015), p. 4.

31 For the strategic alliance with BlackRock see MarketAxess (2013) and for the cooperation with AllianceBernstein see MarketAxess (2016).

years. Moreover, 75 percent of the total traded liquidity («Open Trading» volume) in that quarter did not involve a dealer but was provided by long-only investment managers and other market participants, such as hedge funds.[32]

However, the increasing engagement of buy-side investors does not go without the development of technological systems: It requires investors to introduce supplementing trading capabilities with new skillsets and analytical tools. Buy-side market participants who aim to become active price-makers in bond markets are required to adapt their trading infrastructure. The degree of adoption largely depends upon the investor's level of ambition to engage as a liquidity-provider. BlackRock, for instance, has focused on four key objectives in developing their systems to operate in this environment:[33]

(i) connectivity to multiple electronic trading venues;

(ii) aggregation of multiple sources of liquidity from different venues;

(iii) streamlining trade workflow (e.g. reducing the number of steps to complete a transaction); and

(iv) developing analytical tools to assess the cost of transacting different securities in various market conditions.

In summary, it is evident that bond markets have seen technological innovations that aim to overcome the structural elements interfering with bond markets. This has brought up a variety of different platforms, each trying to facilitate market liquidity in a certain way. These technological innovations have transformed and re-shaped the organisational structure of bond markets meaningfully. Figure 6 illustrates the organisational and structural changes that bond markets have gone through in the last two decades.

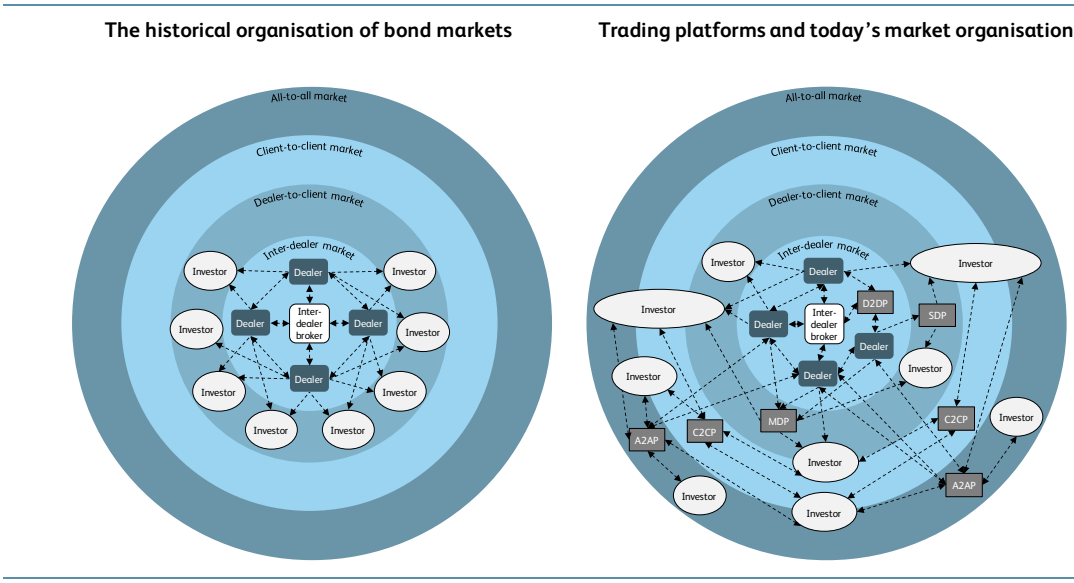

Figure 6: **The introduction of electronic trading platforms and the re-shape of the market organisation** (A2AP: All-to-all platform; C2CP: Client-to-client platform; D2DP: Dealer-to-dealer platform; MDP: Multi-dealer platform; SDP: Single-dealer platform; → Price-taker; ← Price-maker. Source: Own figure)

32 Cf. McVey (2017), p. 2-3.

33 Cf. BlackRock (2015), p. 4.

A major consequence of this development is the increased interconnectivity between market participants: Whereas historically only dealers were connected in the inter-dealer market, there is a higher degree of connectivity among all market participants today. In particular electronic trading platforms, which intermediate trades as a central counterparty, allow investors to broaden their trading-networks and increase the possibility of finding potential opposite trading parties. This scale of interconnectivity among investors and dealers was not possible in the traditionally voice-based, dealer-intermediated market organisation. Today, investors have access to a broader network of potential liquidity providers via platforms and need to rely less on the sole, limited set of dealer-counterparties.

Nowadays, the number of electronic trading platforms is vast and the platforms are multifaceted: Some platforms offer distinctive trading-protocols, others differ in their geographical focus or cover only a selection of products. This has led to a fragmented landscape of trading platforms. Making well-informed trading decisions across this complex universe of trading venues is difficult since gaining an aggregated view is hardly possible without the right technologies in place. The following chapter describes the current landscape of electronic trading platforms and analyses technologies addressing these fragmentation issues.

1.3.5 Platform fragmentation, big data and smart trading networks

As described, the evolution of bond markets in the last two decades has been intensively driven by the introduction and adoption of technological innovations. As a result, the volumes traded on electronic trading platforms have become larger and the share of electronic trading has increased.[34] Nowadays, the number of available electronic trading platforms is vast: This report detects 33 execution platforms that are currently operationally active (see figure 7).[35] The majority of these platforms allow for A2A-trading (=14 platforms), eleven platforms connect dealers with investors (D2C) and nine electronic trading platforms are inter-dealer venues connecting sell-side firms (D2D). One platform enables client-to-client trades exclusively (UBS Bond Port, formerly known as UBS PIN).

All platforms – each equipped with individual trading protocols and different target markets – try to offer market liquidity by bringing together the relevant market participants to one place. However, the vast number of trading venues has led to an extensive fragmentation of the landscape of trading venues. One could argue that this diversity of trading platforms also has a counterproductive effect on market liquidity as liquidity is pooled in a decentralised manner across many trading venues. Moreover, it increases the competition among the platforms and impedes the platform provider from reaching the necessary economies of scale (trading volume) to operate the platform profitably.

As a result of this fragmentation, we have seen numerous corporate actions in the field of electronic trading platforms: Venues have been merged, acquired or have received strategic funds to finance their expansion plans. 18 of the 33 listed platforms in figure 7 have been involved in corporate actions in the last two years (fiscal years 2016/17). Other platforms have increased their

[34] See box 7 on page 15. Many sources also quote Greenwich Associates when it comes to the level of electronification of bond markets. See for instance the latest: Greenwich Associates (2017a), (2017b) and (2016). For a rather early report, see McKinsey & Company, Greenwich Associates (2013).

[35] Figure 28 in the appendix describes the venues in detail.

Electronic trading platform ↓	Platform type
BGC Trader	D2D
Bloomberg ALLQ	D2C
Bloomberg BBX	A2A
Bondpoint	D2C
BrokerTec	D2D
BrokerTec Direct	D2C
Candeal	D2C
CastleOak DirectPool	D2C
Clarity BidRate	A2A
Dealerweb	D2D
EMBonds	A2A
Euronext Synapse	D2D
ITG POSIT FI	A2A
LiquidityEdge Direct	A2A
LiquidityEdge Select	A2A
Liquidnet Fixed Income	A2A
MarketAxess	A2A
MTS Bonds.com	A2A
MTS BondVision	D2C
MTS Cash	D2D
OpenBondX	A2A
OpenDoor Trading	A2A
Saxo Digital Bond Offering	D2C
SGX's Bond Pro Platform	D2D, D2C
SIX Corporate Bonds	D2D
Spain SENAF	D2D
Tradeweb Blast A2A	A2A
Tradeweb Direct	D2C
Tradeweb Institutional Platform	D2C
Trumid Market Center	A2A
TradingScreen – TradeCross	A2A
UBS Bond Port	C2C
Yieldbroker	D2D, D2C

Figure 7: **List of electronic bond trading platforms** (Source: Own research, single-dealer platforms and exchanges are not included)

trading volume by white-labelling their venue to other market participants.[36]

This progressive consolidation process indicates that the market for electronic trading platforms is advanced and mature. As a matter of fact, electronic trading has significantly changed the structure of bond markets and it is evident that the market will never be the same as it was 20 years ago when electronic trading venues were introduced. Therefore, we label the electronification of bond trading as the first phase of the bond market's evolution.

If electronification was the first phase, what is the next and which direction do bond markets evolve in, in the years to come? One observation for anticipating the next evolutionary change is the increasing number of trading systems and smart information networks trying to detect, source and aggregate liquidity across different trading channels. This observation leads to the conclusion that the second phase of bond market's evolution has a lot to do with data. As shown in figure 8, there are currently ten electronic trading systems available that focus on the detection, sourcing and aggregation of liquidity across various channels and market participants. However, some of the tools do more than just source and aggregate liquidity – they intelligently use data to detect market liquidity and potential trading opponents. These trading networks typically rely on the availability of data and aim to transform this data into valuable information for market participants. It seems well justified that «big data» and the smart analysis of information will play an increasingly important role in facilitating bond market liquidity in the future.

The term «big data»[37] can be applied to bond markets for three reasons: First, the phrase «big data» describes the fact that activities are increasingly leaving a *digital trace*. Second, «big data» implies that the *scale of data is vast* and often derived from *various sources*. Third, the idea behind the term «big data» is that these data collections can be analysed in such a way that one can *transform data into value*. Applying these

[36] One example is Saxo Bank's digital multilateral bond trading venue that is white-labelled to third-party banks.

[37] See also Schroeck et al. (2012).

three characteristics on bond markets underpins why «big data» and «market intelligence» (one could also name it «data analytics») are potentially going to play an increasingly important role in detecting liquidity in future:

First, the growing adoption of electronic trading has enabled the digitisation of trading data. Trading information is becoming more and more transparent – facilitated by increased transparency initiatives[38] and regulatory requirements[39] – and the digital trace from market participants and their trading activities can be tracked more seamlessly. This includes the digital recording of trading data as well as the market participants' stated axes, indications of interests and other relevant market data. An example of a data-focused company is Trax, owned by MarketAxess. Since Trax processes an estimated share of 65 percent of all fixed income transactions in Europe[40], they are in the possession of valuable data sets. These data collections can be used in many ways – for instance for benchmarking trades or market-to-market valuations.

Electronic trading system ↓
Algomi
AxeTrader
B2SCAN
HSBC Credit Place
Liquidity Flow
LiquidityChain
Mosaic Smart Data
Neptun
TransFICC
TradingScreen – TradeSmart Fixed Income

Figure 8: **List of electronic bond trading systems** (Source: Own research)

Second, the fragmentation of trading across different channels constricts investors from trading efficiently across the universe of trading venues. A number of companies have detected this data fragmentation issue and offer solutions to collect data from the various sources like electronic trading venues, messaging platforms and voice-channels. Some tools do not only provide an aggregation of this data but also enable investors to trade efficiently on multiple trading venues. Examples for solutions that aggregate liquidity from various sources (e.g. venues, banks, investors) are AxeTrader, B2SCAN, TradeSmart Fixed Income or LiquidityChain. A solution helping to manage the connections to the vast number of electronic trading platforms is TransFICC – a fintech company launched in 2016. TransFICC is a central hub for market participants connecting multiple trading venues to one place.

Third, we observe firms that transfer information into value by applying a more holistic view on the collection of data. These firms typically do not only capture trading flows and market data – as described above – but they seek additional information that could be of relevance when investors are looking for an opposite trading party. One example of such a service provider trying to create a holistic bond information platform is Algomi. Algomi does not only collect relevant trading and market data, but they also collaborate with custodian banks that safeguard bond holdings. For instance, they collaborate with HSBC and BNY Mello, with the latter being the largest custody bank in the world with USD 32.2 trillion

38 For instance, since 2001 the Securities and Exchange Commission («SEC») requires members from the Financial Industry Regulatory Authority («FINRA») to report OTC secondary market transactions in eligible fixed income securities to the FINRA's Trade Reporting and Compliance Engine («TRACE»). Cf. FINRA (2008), p. 7.

39 For instance, as of January 3, 2018 Markets in Financial Instruments Directive II («MiFID II») introduces extended pre- and post-trade transparency requirements for non-equity instrument. The preliminary results are impressive: In January 2018, Bloomberg published «last trade»-prices in more than 20'000 bonds from more than 150 countries and reported nearly 12'000 trades in corporate bonds in real-time. Source: Bloomberg MOSB MIFID <GO>.

40 Source: http://www.traxmarkets.com/about % 20us.aspx

assets under custody[41]. Algomi allows custody clients to make holdings information available to the Algomi's bond network. Network members will be able to query those holdings, which will alert the custody holder and give them the ability to trade on the request.[42] The idea of mining data to give market participants a view into the location of every single bond has the potential to unfold a pool of liquidity that could possibly have a big impact.

The likely winner in the race to effectively utilise data are the market participants that do not only use the right analytical technology to detect and aggregate liquidity, but that also have the required order execution technologies in place to transform orders into trades. Therefore, it is important that market participants actively adopt technologies in order to find liquidity in the required scale and to trade this liquidity in the appropriate place. Fact is, bond markets are evolving and so are the underlying technological innovations. It seems unquestionable that the future of bond markets is not the traditional status quo in which investors are solely connected to a set of dealers, but rather in a market organisation where all market participants are interconnected and where technology is key to detect and trade liquidity.

1.4 Environment: The regulatory framework for Swiss market participants

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1.4.1 Regulation of bond trading: Setting the scene

The following chapter will provide an overview of the key regulatory requirements for trading professionally in securities in the form of a bond in Switzerland.

A bond in the form of a «security» in the sense of Art. 2 para. 1 lit. b FinfraG/FMIA[43] is offered at uniform conditions to multiple parties.[44] Securities are, in other words, standardised, certificated and uncertificated financial instruments suitable for mass trading. They are thus either offered publicly in a similar structure and denomination or placed with more than 20 clients, unless they are being created specifically for individual counterparties.[45]

A security in the form of a bond can trigger multiple legal consequences when being traded. These consequences are:

- Persons professionally trading in securities will potentially have to apply for a licence as a securities dealer (the Swiss equivalent of an investment firm or broker/dealer).
- Facilities allowing for the multilateral trading of securities require a licence as a stock exchange or multilateral trading facility (MTF).
- Facilities allowing for the bilateral trading of securities must be operated by a duly licensed operator (the Swiss bilateral version of an OTF,

41 As of September 30, 2017. Source: https://www.bnymellon.com/us/en/_locale-assets/pdf/news/at-a-glance-corporate-fact-sheet.pdf

42 Source: http://www.algomi.com/company-news/bny-mellon-and-hsbc-team-up-with-algomi

43 Swiss Financial Market Infrastructure Act (FinfraG/FMIA).

44 Art. 1157 para. 1 Swiss Code of Obligations.

45 Art. 2 para. 1 Swiss Financial Market Ordinance (FinfraV/FMIO).

which replaces the Systematic Internaliser in the EU).

- The public offering of securities requires a prospectus. The listing of securities on a trading venue (stock exchange and MTF) also requires the filing of a listing application and the creation of an accompanying prospectus.

1.4.2 Regulation of investment firms trading bonds pre-FinSA

1.4.2.1 Swiss-based securities dealers

Professional trading in securities in the form of bonds typically requires a licence as a securities dealer granted by the Swiss Financial Market Supervisory Authority FINMA. The detailed requirements and licensing process depends heavily upon the place of domicile of the securities dealer and the type of business activity pursued. A Swiss-domiciled securities dealer is any legal entity or partnership that professionally[46] sells or buys securities in the form of bonds either

- on its own account on the secondary market with the intent of reselling them within a short period of time (own account dealers and market makers), or
- for the account of third parties (client dealers), or
- publicly offers securities in the form of bonds to the public on the primary market (issuing houses).[47]

Own account dealers and issuing houses have to be primarily active, on an individual and group-consolidated level, in the financial sector. This means that the main business activity of a group must be in the financial sector. Even sizeable securities trading activities of treasury companies within a group that is pursuing a primary business purpose other than a financial activity are thus not subject to the licensing requirements of a securities dealer if the securities trading is closely related to the group's business activity.[48] This does not, however, apply to market makers and client dealers that will have to apply for a license even if the group's main business activity is not a financial activity.

Trading on one's own account (proprietary trading)

Securities dealers trading on their own account with bonds will only have to apply for a license if they pose a systematic risk to the financial system. That is why their gross annual turnover in securities such as bonds must achieve at least CHF 5 billion.[49] They typically do not have any clients. Securities dealers trading on their own account generally act in a professional capacity and on a short-term basis. Key aspects of trading on one's own account include trading without instructions from third parties and taking on risk, which is primarily market risk. In the context of a clearing situation it can, however, lead to a counterparty risk if clients do not advance money to settle the securities.[50] Trading on a short-term basis means the active management of securities to achieve gains from short-term fluctuations in prices or interest rates within a short period of time. Long-term investments in securities in the form of bonds and in particular the holding of securities in the form of bonds until maturity are not deemed to be trading on one's own account.

Trading on one's own account (market makers)

Market makers trade securities in the form of bonds publicly, in a professional capacity, on their

46 Meaning any separate and independent economic activity that is designed to achieve regular revenues (see FINMA-Circular 2008/5 Securities Dealer, chiff. 129).

47 Art. 2 lit. d Stock Exchange and Securities Trader Act (SESTA) in combination with Art. 2 and 3 Swiss Stock Exchange and Securities Trader Ordinance (SESTO).

48 FINMA-Circular 2008/5 Securities Dealer, chiff. 8 et seq.

49 FINMA-Circular 2008/5 Securities Dealer, chiff. 23.

50 FINMA-Circular 2008/5 Securities Dealer, chiff. 21.

own account and on a short-term basis. They trade publicly, because they offer the securities to anybody. They set a firm bid and ask for prices on an ongoing basis or on request (request for quote).[51]

Trading on behalf of third parties (client trading)

Client dealers handle securities in the form of bonds in their own name, but on behalf of clients, in their professional capacity. A professional capacity is already assumed if the securities dealer maintains accounts directly or indirectly or acts as a custodian for more than 20 clients.[52] Whether the securities dealer is dealing on the client's account or on his/her own account is determined based on economic considerations, namely who is bearing the risk of the transaction. In the case where the client is bearing the economic risk, trading activities over the nostro accounts of the securities dealer are deemed transactions on behalf of the client.[53] Client dealers maintain accounts for the settlement of the transactions for these clients or with third parties, or keep these securities for themselves or for third parties in their own name.[54]

No licensing requirement is triggered if the entity only deals with clients who are Swiss or foreign banks or securities dealers, other enterprises under government supervision, shareholders or companies with significant holdings in the debtor and any parties affiliated or related to them, and institutional investors with professional treasury departments. Asset managers and investment advisors are not deemed to be securities dealer if they are acting based on a power of attorney, unless they purchase or sell securities to their clients using their own account or securities deposits.[55]

Issuing bonds as securities (issuing houses)

Securities dealers in the form of issuing houses underwrite bonds issued by third parties on a professional basis at a fixed price or for a commission and offer them to the public on the primary market.[56] A key criteria to decide whether the underwriting and placement of bonds in the primary market is the activity of a securities dealer is thus, whether it is «public». An offering is public if it is addressed to an unlimited number of persons, in particular by means of advertisements in the media, prospectuses or other electronic means. Offers of securities made exclusively to qualified investors such as domestic and foreign banks and securities dealers or other enterprises under government supervision, shareholders and partners with a significant equity interest in the borrower and parties affiliated and related to them, and institutional investors with professional treasury departments, meaning the employment of one person on a full time basis managing the company's assets, are not considered.[57] An offering is deemed to be «public» even if bonds have been placed with fewer than 20 people, but the offering has been addressed to an unlimited number of people not being exclusively qualified investors.[58]

1.4.2.2 Foreign securities dealers

Foreign securities dealers are entities that either

- possess an equivalent licence abroad, or
- apply the expression «securities dealer» or an expression of similar meaning in their corporate name, business purpose, or documents, or
- conduct trading in securities as defined in Art. 2 lit. d SESTA.

Foreign securities dealers, meaning entities that

51 Art. 3 para. 4 SESTO.
52 FINMA-Circular 2008/5 Securities Dealer, chiff. 49.
53 FINMA-Circular 2008/5 Securities Dealer, chiff. 50.
54 Art. 3 para. 5 SESTO.
55 FINMA-Circular 2008/5 Securities Dealer, chiff. 52.
56 Art. 3 para. 2 SESTO.
57 FINMA-Circular 2008/5 Securities Dealer, chiff. 14 et seq.
58 Art. 4 SESTO.

are not domiciled in Switzerland, are generally subject to the same requirements as Swiss-domiciled securities dealers, unless the law sets forth different obligations.[59] Securities dealers that are factually managed in Switzerland and execute their transactions mainly out of Switzerland must incorporate in Switzerland and be organised according to Swiss regulations. They will be subject to the regulatory requirements of a Swiss securities dealer.[60] Securities dealers organised under Swiss law are deemed to be under foreign control if a foreign person indirectly or directly holds more than 50 percent of the votes or has in any other way a material influence on the securities dealer.[61]

Foreign securities dealers will need to be licensed in Switzerland either as a branch or as a representation office if they employ staff in a professional capacity in Switzerland on an ongoing basis.

Branch

Foreign securities dealers will need to be licensed as a branch of a foreign securities dealer in Switzerland if they trade securities, have client accounts, or legally oblige the foreign securities dealer.[62]

Representation office

The securities dealer will need to be licensed as a representation office of a foreign securities dealer if it becomes active in any other way in Switzerland, namely by forwarding client orders or performing representational activities.[63] According to established FINMA practice, the following activities are typical of a foreign securities dealer:[64]

- Employing persons in Switzerland that are fully integrated into the organisation and brokering securities trades and forward orders.
- A corporation in Switzerland that is not licensed as a Swiss securities dealer, but carries the same or a similar name and brokers securities and forwards orders.
- Existence of exclusive contracts with natural persons and legal entities in Switzerland to broker securities. The Swiss representative acts in such a situation exclusively for the foreign securities dealer and gets reimbursed for each trade.
- Conclusion of non-exclusive contracts with natural persons and legal entities in Switzerland for the brokering of trades, but authorisation to use its own corporate name. The representative is compensated for each trade.

Member of a Swiss trading venue

Non-Swiss-domiciled members of a Swiss trading venue such as SIX Swiss Exchange or the multilateral trading facility SIX Corporate Bonds must be approved by FINMA prior to becoming a member of such a trading venue as a «foreign participant to a Swiss trading venue».[65]

1.4.2.3 Swiss asset managers

Swiss based asset managers are licensed by FINMA if they are managing collective investment schemes.[66] They ensure proper conduct of portfolio and risk management for one or more collective investment schemes. They might also be entitled to perform additional activities, such as the discretionary management of individual portfolios.[67] They are however not entitled to engage in a securities dealer activity. Any such activity requires an additional license as securities

59 Art. 40 SESTO.
60 Art. 38 para. 2 SESTO.
61 Art. 56 SESTO.
62 Art. 39 para. 1 lit. a chiff. 1 SESTO.
63 Art. 39 para. 1 lit. a chiff. 2 SESTO.
64 FINMA-Circular 2008/5 Securities Dealer, chiff. 54 et seq.
65 Art. 40 FMIA.
66 Art. 18 Swiss Collective Investment Schemes Act (CISA).
67 Art. 18a para. 3 CISA.

dealer. A duly licensed securities dealer does not, however, require an additional license as an asset manager of collective investment schemes.[68] Swiss based asset managers, however, have the duty to carefully select counterparties for securities trades and other transactions. They must offer a guarantee of best execution in terms of price, time and quantity. The choice of counterparties must be reviewed at regular intervals.[69]

Asset managers solely managing individual portfolios are currently not obliged to apply for a license with FINMA. They are, however, subject to duties under the Swiss anti-money-laundering regulation and must register with a self-regulatory organisation.

1.4.2.4 Obligations of a securities dealer

Requesting a licence

Anyone falling within one of the categories of a securities dealer mentioned above has to apply for a licence with the Swiss Financial Market Supervisory Authority FINMA. The licence will be granted if certain key requirements are fulfilled at the time the licence is granted and on an ongoing basis.

Organisational requirements

A securities dealer must have an adequate organisation in place that allows for the execution of its activities. The securities dealer must have a board of directors and management. The members of the management have to be fit and proper for the execution of their respective function. There must be an adequate separation between trading, asset management and administration.[70] The securities dealer must also establish an internal control system consisting of compliance, risk management and internal audit.[71] An external regulatory audit firm must also be appointed. It is possible to unify some of the control functions with a specific person.

Capital requirements

Any securities dealer must have a fully paid-in minimal capital amount of at least CHF 1.5 million. Any shareholder indirectly or directly holding more than 10 percent of the capital or the voting rights of a securities dealer or that may in any other way influence the business activities of the securities dealer must pass the fit and proper test of FINMA.[72] The provisions applicable to banks regarding own capital and accounting generally also apply to a securities dealer.[73] Privileged deposits of clients are subject to enhanced protection.[74]

Reporting, information and approval obligations

Any securities dealer will have to comply with multiple reporting, information and approval obligations on an ongoing basis. Any change to the preconditions for granting the licence, but in particular the articles of association, regulations, material change of business activity, management, board of directors and external audit firm, as well as build ups, investments and divestments of foreign operations must be pre-approved by FINMA.[75]

Any indirect or direct acquisition or sale of a stake in a securities dealer reaching, exceeding, or falling below the thresholds of 20 percent, 33 percent or 50 percent of the capital or the votes must be reported to FINMA.[76]

Securities dealers have to report any orders and transactions in securities as well as derivatives that

68 Art. 8a Swiss Collective Investment Schemes Ordinance (CISO).
69 Art. 22 CISA.
70 Art. 19 SESTO.
71 Art. 20 SESTO.
72 Art. 23 SESTO.
73 Art. 29 para. 1 SESTO in combination with the Capital Adequacy Ordinance and the Banking Ordinance.
74 Art. 29a SESTO.
75 Art. 25 SESTO.
76 Art. 28 SESTO.

are being derived from securities listed on a Swiss trading venue.[77] Such reporting must be made to the corresponding trading venue.[78]

Algorithmic and high frequency trading

Participants in Swiss trading venues that are engaging in algorithmic or high frequency trading activities are subject to enhanced recording requirements and their systems must ensure adequate functioning even in stress situations.[79]

Direct electronic market access

A securities dealer being a member at SIX Swiss Exchange may grant clients direct access to the exchange. The participant remains liable to the exchange for all actions and non-actions on the part of such clients.[80]

Latest Fintech developments regarding securities dealers

The Swiss Banking Ordinance has recently been amended effective as of August 1, 2017 to better accommodate Fintech entities. Client accounts that are solely used for the settlement of client business within 60 days are thus not deemed to be client deposits potentially triggering the requirement of getting licensed as a bank. The settlement period has thus been extended from the prior 7 days to 60 days. However, this change applies only to banks, but not securities dealers, for whom the current FINMA practice still applies, which does not set forth a particular deadline, but a case-by-case approach.

1.4.3 Regulation of investment firms trading bonds under the FinSA- and FinIA-regime

1.4.3.1 Bond trading and execution under the FinSA-regime

Securities will fall within the scope of application of FinSA, because they are assets, meaning financial instruments and other financial investments, in the sense of FinSA.[81] Trading in securities and the execution of client orders related to trading on one's own account in securities in the form of bonds is a financial service.[82] These activities can thus generally only be executed by duly licensed financial intermediaries.

1.4.3.2 Behavioural requirements

FinSA sets forth new behavioural requirements for financial market participants. Some of these obligations have already been applied under prior applicable regulations. Others have already been applicable under contract law and have been transformed into regulatory law. The trading in securities and the execution of orders related to securities in the form of financial services are subject to multiple requirements, such as but not limited to client classification, the duty to stay educated, the duty to inform clients and the duty to document and justify.[83] No suitability and appropriateness test must be made by financial intermediaries who are solely executing or forwarding orders related to securities initiated by clients.[84] An important behavioural conduct rule in the context of the execution of trades in securities is the duty of «best execution». Financial intermediaries must ensure that any execution made for clients is done as optimally as possible in terms of price, time of execution and other

77 Art. 30 SESTO.
78 Art. 31 SESTO.
79 Art. 31 Swiss Financial Market Infrastructure Ordinance (FMIO) (SR 958.11).
80 Art. 4.3.3. SIX Swiss Exchange Ltd. Rule Book of 15/06/2017.
81 Art. 3 para. a chiff. 2 and 8, and para. c FinSA.
82 Art. 3 para. d. chiff. 1 and 2 FinSA.
83 See Art. 4, 6, 8 and 9 Bundesgesetz über die Finanzdienstleistungen (Finanzdienstleistungsgesetz, FinSA).
84 Art. 14 para. 1 FinSA.

criteria.[85] Securities lending activities related to securities of clients require specific prior written consent.[86]

1.4.3.3 Organisational requirements

Investment firms trading in securities or executing orders related to securities are also subject to organisational requirements addressing conflict of interest situations and inducements.[87] The new regulatory obligations about inducements orient themselves particularly closely towards the case law related to discretionary asset management agreements.

1.4.3.4 Investment firms trading in securities under the FinIA regime

Under the new FinIA regime[88] securities dealers will be called investment firms to be in line with the EU terminology.[89] According to FinIA an investment firm is – or is at least supposed to be – regulated identically to a securities dealer under the SESTA. Any professional trading on one's own account or on behalf of clients in securities thus requires a license as an investment firm.[90] The draft-FINIA also states, however, that proprietary traders who are members of a trading venue, but who do not reach an annual turnover of CHF 5 billion, must be licensed as securities dealers. An investment firm can have accounts for the settlement of securities. Securities can also be held with third parties.[91] However, it cannot take deposits from third parties. Any such activity requires a banking licence.[92] Every investment firm is subject to minimal capital requirements, regulatory capital requirement, liquidity and risk management obligations.[93] It has to record the orders received and the executed transaction and will have to do the required reporting to the regulator.[94]

1.4.4 Regulation of facilities for the trading in bonds

1.4.4.1 Stock exchange, MTF, and OTF

Bonds can be traded in Switzerland on three main facilities, namely the stock exchange,[95] multilateral trading facility (MTF),[96] and the organised trading facility (OTF). Stock exchanges and MTF are also called trading venues and differentiate themselves mainly in the listing of securities. Securities that are not listed on a MTF, meaning that there is no admission of a security in accordance with a standardised procedure whereby requirements regarding issuer and securities are being verified.[97] Bonds are currently traded on the SIX Swiss Exchange, the SIX Corporate Bonds (MTF), and BX Berne Exchange.

In Switzerland, an OTF is the default facility for many other trading set-ups encompassing bilateral[98] and multilateral[99] as well as discretionary and non-discretionary trading activities in both securities and financial instruments, meaning any other financial

85 Art. 20 para. 1 FinSA.
86 Art. 21 para. 1 FinSA.
87 Art. 27 and 28 FinSA.
88 Bundesgesetz über die Finanzinstitute (Finanzinstitutsgesetz, FinIA).
89 Art. 2 para. 1 lit. e FinIA.
90 Art. 37 para. 1 lit. a FinIA.
91 Art. 40 para. 1 lit. b FinIA.
92 Art. 40 para. 3 FinIA.
93 Art. 41 to 43 FinIA.
94 Art. 46 and 47 FinIA.
95 Art. 26 para. 1 chiff. b Swiss Financial Market Infrastructure Act (FMIA/FinfraG). A stock exchange means an institution for multilateral securities trading where securities are listed, whose purpose is the simultaneous exchange of bids between several participants and the conclusion of contracts based on non-discretionary rules.
96 Art. 26 para. 1 chiff. c FMIA. A MTF means an institution for multilateral securities trading whose purpose is the simultaneous exchange of bids between several participants and the conclusion of contracts based on non-discretionary rules without listing securities.
97 Art. 2 para. 1 chiff. f FMIA.
98 See FINMA Circular 2018/1 Organised trading facilities chiff. 23, bilateral trading involves always the operator of the facility as counterparty. He also takes market risk.
99 See Art. 22 para. 1 Swiss Financial Market Infrastructure Ordinance (FMIO/FinfraV).

instruments used for investment purposes not being securities.[100] Trading activities on an OTF is any trading activity that (i) is governed by a set of rules that is standardised and binding to participants, (ii) allows for the conclusion of contracts within the scope of application of these rules, and (iii) takes place when the initiative to trade can come from the participants.[101] An OTF can only be operated by a bank, securities dealer, trading venue, facility recognised as a trading venue, or a legal entity within a financial group that is controlled directly by a financial market infrastructure and is subject to consolidated FINMA supervision.[102] Unlike under MiFID II/MiFIR, a systematic internaliser is, under the Swiss regime, not a special category of investment firm/securities dealer, but is either a bilateral OTF or securities dealer if these requirements are met.

1.4.4.2 Organisational requirements of trading venues

The organisational requirements of all trading venues (MTF and Stock Exchange) are identical in their core and subject to their own regulatory and supervisory organisation which is appropriate for their activities and approved by FINMA. Trading venues must ensure an adequate organisation of the trading activities from a regulatory, technical, and organisational point of view that allows for pre- and post-trade transparency of bid and ask prices and related volumes.[103] They have to appoint an independent body responsible for the regulation of the activities of the trading venue and the listing of securities in the case of a stock exchange[104] and the admission of securities in the case of an MTF.[105] Participants can either be securities dealers, foreign market participants, or other parties supervised by FINMA.[106] The trading and compliance of the participants with the rules and regulations must be supervised by an independent body which has to inform FINMA in case of illicit activities and irregularities.[107] Certain admissions or delistings of securities and participants might be appealed with an independent appelate body.[108] Trading venues must designate trading activities resulting from algorithmic trading activities. Participants engaging in algorithmic trading activities are also subject to specific requirements applicable to their systems.[109]

1.4.4.3 Organisational requirements of an OTF

The operation of an OTF is also subject to requirements that ensure an orderly trading, transparency, and investor protection, such as best execution requirements in case of discretionary trading.[110] Any operator of an OTF must issue rules and regulations and appoint an independent control function that monitors compliance with these regulations.[111] Pre-trade transparency is required in the case of bilateral and multilateral liquid trading, meaning at least 100 trades on average per day over the last year.[112] Post-trade transparency is only required in the case of multilateral trading.[113] Anyone operating an OTF or intending to do so in the future must report this fact to FINMA.[114]

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100 See Art. 3 lit. b Draft-Swiss Financial Services Act (FinSA/FidleG)
101 FINMA Circular 2018/1 Organised trading facilities chiff. 5.
102 Art. 43 FMIA.
103 Art. 27 and 29 FMIA. See also Art. 27 and 28 FMIO.
104 Art. 35 FMIA.
105 Art. 36 FMIA and Art. 24 Swiss Financial Market Infrastructure Ordinance (FMIO).
106 Art. 34 FMIA.
107 Art. 31 FMIA.
108 Art. 37 FMIA.
109 Art. 31 FMIO.
110 Art.39 FMIO.
111 FINMA Circular 2018/1 Organised trading facilities chiff. 30 et seq.
112 Art. 42 FMIO. FINMA Circular 2018/1 Organised trading facilities chiff. 37 et seq.
113 Art. 43 FMIO.
114 FINMA Circular 2018/1 Organised trading facilities chiff. 42.

1.4.4.4 Trading in bonds under MiFID II/MiFIR

Under the MiFID II/MiFIR-regime, bonds can be traded on regulated markets, multilateral trading facilities, organised trading facilities, and through systematic internalisers if dealing is done on one's own account, when executing client orders outside a regulated market,[115] MTF,[116] or OTF[117] on an organised, frequent systematic and substantial basis.[118]

1.4.5 Regulation of Swiss investment firms trading securities in the EU markets

1.4.5.1 Trading in securities as an investment service under MiFID

Dealing on one's own account, the execution of orders on behalf of clients, and the reception and transmission of orders in relation to one or more financial instrument, such as transferable securities in the form of bonds, is an investment service under MIFD I and MiFID II.[119]

1.4.5.2 Provision of investment services to clients domiciled in the EU on a pure cross-border basis

Swiss-domiciled investment firms providing investment services to clients domiciled in the EU on a pure cross-border basis are so-called «third country investment firms»[120] and are able to continue to provide services and activities in EU member states in accordance with the national regimes until three years after the adoption of the equivalence decision of the European Commission according to Art. 47 MiFIR.[121] The principle of «reverse solicitation» allowing for the unrestricted provision of an investment service to EU-domiciled clients will, however, remain applicable to a situation in which a client domiciled in the EU initiates such services at its own exclusive initiative.[122] EU member states could, at least theoretically, also require that a Swiss-based investment firm trading in bonds on a pure cross-border basis would have to establish a branch in this territory.[123]

1.4.5.3 Membership of an EU-based trading venue

The pure fact that a Swiss-domiciled investment firm is trading on an EU-based regulated market on a pure cross-border basis without having clients domiciled in the EU is not an investment service in the sense of MiFID II. It is thus under the discretion of the individual member states to impose restrictions and obligations on such trading activity. Member states typically require a regulation by means of remote access or by setting up a branch in the host member state.[124]

1.4.6 Regulation under Swiss anti-money laundering regulations

1.4.6.1 Application to securities dealers

Securities dealers duly licensed by FINMA are financial intermediaries according to Art. 2 para. 2 lit. b AMLA.[125] They are subject to the requirements of the Swiss anti-money laundering provisions. Any other trading activities are not subject to the Swiss anti-money laundering

115 See definition in Art. 4 para. 1 chiff. 21 MiFID II.
116 See definition in Art. 4 para. 1 chiff. 22 MiFID II.
117 See definition in Art. 4 para. 1 chiff. 23 MiFID II.
118 See Art. 13 Commission Delegated Regulation (EU) 2017/565 of 25 April 2016.
119 Annex I Section A chiff. 1, 2, 3, and Section C chiff. 1 Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2001/92/EC and Directive 2011/61/EU (MiFID II).
120 Art. 4 para. 1 chiff. 57 MiFID II.
121 Art. 54 para. 1 Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulatioin (EU) No 648/2012 (MiFIR).
122 Art. 46 para. 5 MiFIR and Art. 42 MiFID II.
123 Art. 39 para. 1 MiFID II.
124 See Art. 36 MiFID II.
125 Federal Act on Combating Money Laundering and Terrorist Financing (SR 955.0).

regulations.[126] By analogy, entities trading in financial instruments that are not securities do not fall within the scope of application of Swiss anti-money laundering regulations. The key requirements securities dealers have to fulfil are the verification of the identity of contractual parties and the establishment of the identity of the controlling person and the beneficial owner according to the CDB16.[127,128]

1.4.6.2 Identification of the client

The securities dealer must verify the identity of the contracting partner when establishing business relationships. The execution of transactions involving trading in securities must exceed CHF 25,000 in case of an account opening.[129] For natural persons, the following topics must be appropriately documented:[130]

- Name,
- First name,
- Date of birth,
- Nationality and the actual domicile address, as well as
- Means used to prove identity.

For legal entities and partnerships, the following topics must be appropriately documented:

- Company name,
- Actual registered office, as well as
- Means used to prove identity.

1.4.6.3 Establishment of the identity of controlling persons and beneficial owners

If an operating legal entity or partnership has one or more controlling persons with voting rights or capital shares of 25 percent or more, these are to be identified in writing. Controlling persons are those natural persons who effectively have ultimate control over the company. Whether these persons exercise control directly or indirectly via intermediate companies is irrelevant. A controlling person must generally be a natural person. The contracting partner must confirm the name, first names and actual domicile address of the controlling person in writing or by using Form K.[131]

The bank requires, from its contracting partner, a statement concerning the beneficial ownership of the assets. Generally, the beneficial owners of the assets are natural persons.[132] If the contracting partner declares that the beneficial owner is a third party, then the contracting partner has to document the latter's last name, first name, date of birth and nationality, along with actual domicile address, or the company name, address of registered office and country of registered office using Form A.[133]

1.4.6.4 Business relationships and transactions with increased risk

Securities dealers have to determine business relationships and transactions that are subject to increased risk.[134] The initiation of such business relationships and the execution of such transactions are subject to enhanced due diligence requirements.[135] Such business relationships must be approved by the management.[136]

1.4.6.5 Organisation

The securities dealer must establish an organisation that allows for efficient compliance with the applicable anti-money laundering

126 Art. 5 para. 2 Federal Ordinance on Combating Money Laundering and Terrorist Financing (AMLO) (SR 955.01).
127 Agreement on the Swiss Banks' Code of Conduct with regard to the exercise of due diligence (CDB16).
128 Art. 35 Federal Ordinance on Combating Money Laundering and Terrorist Financing of FINMA (AMLO-FINMA) (SR 955.033.0).
129 Art. 4 para. 1 and 2 CDB.
130 Art. 7 CDB.
131 Art. 21 CDB.
132 Art. 27 para. 1 CDB.
133 Art. 28 para. 1 CDB.
134 Art. 13 and 14 AMLO-FINMA.
135 Art. 15 AMLO-FINMA.
136 Art. 19 AMLO-FINMA.

regulations and, in particular, must designate a dedicated anti-money laundering function.[137] New products must be checked by the securities dealer for their compliance with the applicable regulations. Securities dealers must, in particular, establish an effective mechanism for the surveillance of the transactions and the business relationships based on an IT system.[138]

[137] Art. 24 AMLO-FINMA.

[138] Art. 20 AMLO-FINMA.

2 An outside-in view on Swiss-based investors active in bond trading

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2.1 Introduction

The objective of this survey is to increase our understanding of how local banks, securities dealers, asset managers, fund management firms and insurance companies[139] execute and place bond orders nowadays. From an international perspective, Swiss market participants active in bond trading rarely get much attention, as they are overshadowed by the large players from the US and the UK. We want to shed light on the Swiss market participants' trading infrastructure in order to assess their level of technological adoption. Moreover, the survey aims to describe the correlation between the investors' trading infrastructure and the occurrence of liquidity problems. The survey shall address the question if firms with a technologically less advanced trading infrastructure face more liquidity problems than those that have a broader market access with a better-developed trading infrastructure.

To quantify these questions, the participants were first asked about their counterparty and bond brokerage network and how they trade bond orders. Second, the questionnaire examines the actual penetration of electronic trading and how trades are allocated across the various venues. Third, participants were asked about their assessment of the current bond market liquidity and how often they face problems to buy/sell bonds due to insufficient market liquidity.

2.1.1 Scope and methodology

Between January 4 and January 25, 2018, we conducted a personalised online survey among 320 Swiss firms active in fixed income trading – 112 companies participated in the survey. The focus of the survey were companies that dispose of a bond brokerage network to place and execute bond orders on their own behalf or on behalf of their clients. Since the survey was designed as a personalised questionnaire, ensuring no firm was included multiple times, we can conclude that the quantity of 112 participants represents approximately one-third of the total community in Switzerland that is equipped with a trading infrastructure to place bond orders – see figure 9.

[139] Some insurance companies in Switzerland operate an asset management unit.

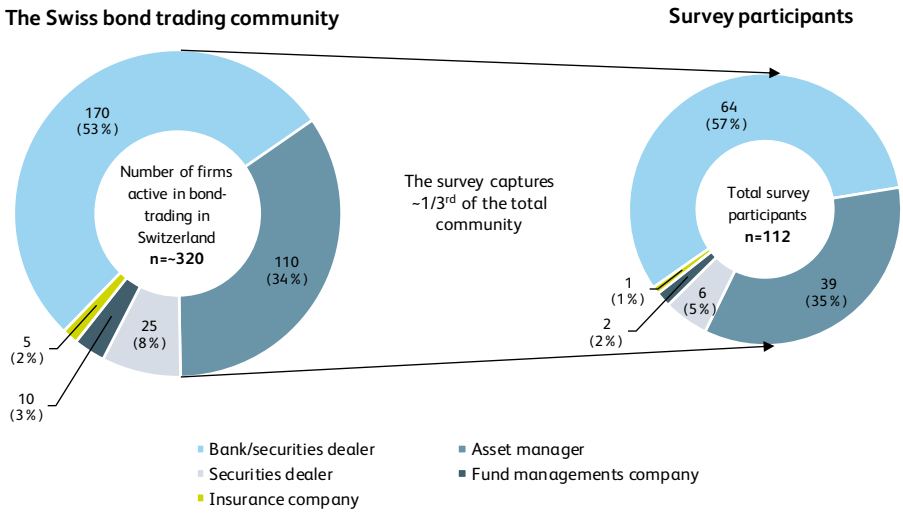

Figure 9: Bond trading community in Switzerland and number of respondents by institution

To detect the total number of companies that dispose of a bond brokerage infrastructure, we first collected all firms that operate under one of the following FINMA-licenses: Bank/securities dealer licence, (pure) securities dealer license, licensed as asset manager of collective investment schemes (FINMA-licensed asset manager) or licensed as a fund management company. We then removed those firms that do not invest in bonds or that potentially do not maintain a bond brokerage network in Switzerland. Moreover, we removed firms that have more than one FINMA-licence to avoid double contacts. 320 companies remained that are likely to execute and place bond orders on their own behalf or on behalf of clients. After we had detected the appropriate firms, we personally contacted the people in charge of trading and execution. However, since many firms in Switzerland – especially smaller sized banks and asset managers – do not engage staff dedicated solely to the execution of bond orders, we alternatively contacted people that are likely to be involved in the trading process.

From a methodical point of view, it is essential to note that the following findings and conclusions are based upon descriptive statistics. Since we did not check the findings on statistical significance, we cannot generalise the results beyond our survey sample. We limit our findings to our sample of 112 survey participants.

2.1.2 Description of the survey participants

Figure 10 illustrates the position of the responding participants within their organisation: The majority of the responding participants work as the heads of trading/execution (= 36 percent), portfolio managers (= 22 percent), investment officers (=16 percent) or as chief executive officers (=11 percent).

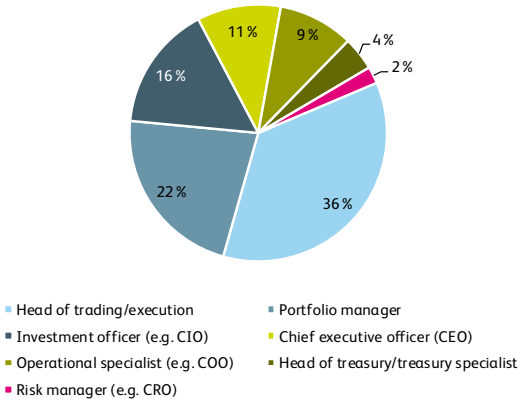

Figure 10: Job title of the responding participants (n=95)

Figure 11 shows the survey participants by institution type: The majority of the participating firms operate under a bank/securities dealer licence (=64 firms) or belong to the group of FINMA-licensed asset managers (=39 companies). The right hand chart in figure 11 visualises the distribution of the respondents by bank type. The top three responding companies with a bank/securities dealer license are regional banks (=24 respondents), private banks (=18) and cantonal banks (=15). This means that ~39 percent of the regional and savings banks, ~40 percent of the private banks[140] and ~63 percent of the cantonal banks participated in the survey.

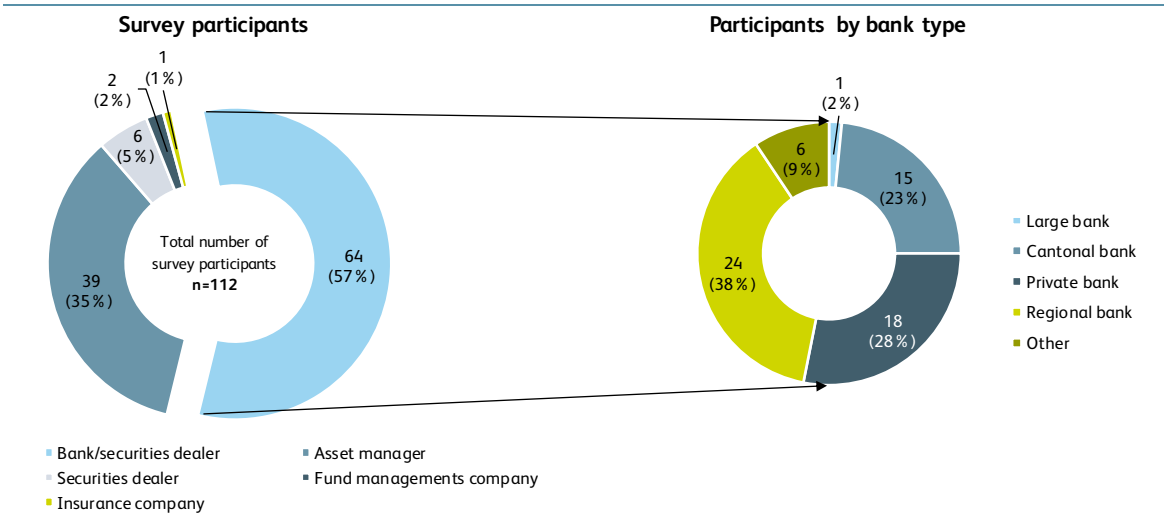

Figure 11: Survey participants by institution type
(n=112)

Figure 12 illustrates the assets under management (AuM) of the participating firms and the average trading volume per week (in CHF, market value). 63 percent of the companies have less than CHF 5 billion AuM and a corresponding 58 percent of the firms trade less than CHF 5 million in bonds per week on average. On the other hand, 25 percent of the survey respondents indicate to manage between CHF 5–15 billion; 12 percent have more than CHF 15 billion AuM (this group includes four cantonal banks, four private banks, one large bank, one regional bank and one insurance company).

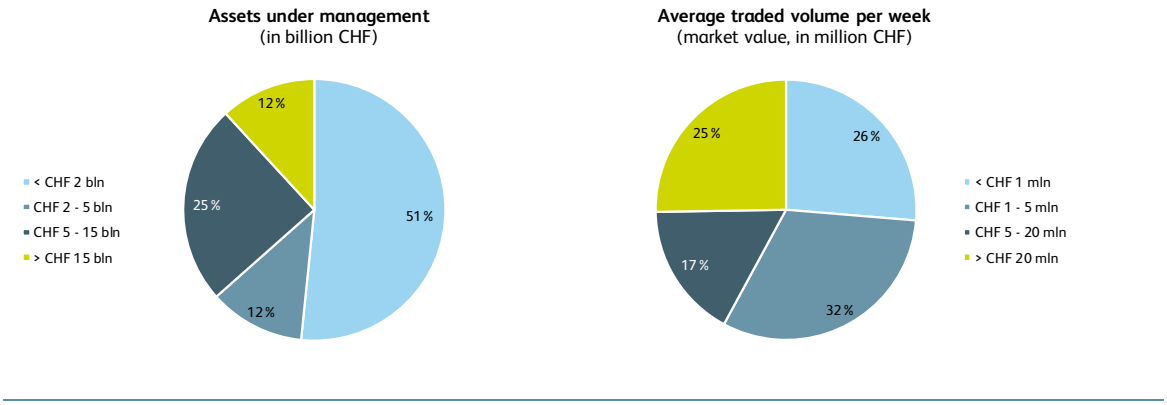

Figure 12: Company details and trading specifics
(n=93)

[140] This includes banks specialised in exchange, securities and asset management business.

2.2 Descriptive statistics from survey sample

2.2.1 10 percent have externally outsourced the execution of bond orders

Eleven survey participants (=10 percent of all survey participants) indicate that they have outsourced or delegated the execution of bond orders to an external trading desk. This group contains four asset managers, four regional banks, two private banks and one cantonal bank. Figure 13 illustrates to whom they have outsourced the execution of bond trades: The majority of 73 percent (=8 companies) have delegated the execution of bond orders to a bank. There are a number of banks in Switzerland offering their (best-execution) desk to external clients – examples thereof are UBS, Credit Suisse or Pictet. On the other hand, there are «transaction banks» that focus on the provision of transaction banking services, examples thereof are InCore Bank AG or Entris Banking, who process trading-orders and provide business process outsourcing for other banks. Considering our findings below, the number of companies outsourcing the execution of bond orders may increase in the future since an efficient execution process requires an advanced trading infrastructure. This conclusion holds especially for smaller-sized investors transacting only small trading volumes and thus hardly reaching a sufficient scale that would be necessary to maintain a «state of the art» trading infrastructure.

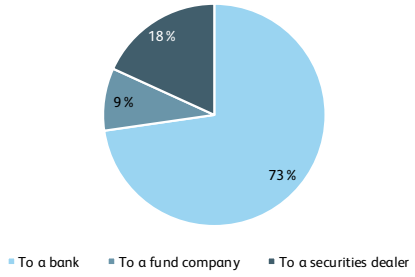

Figure 13: To whom has bond trading been outsourced?
(n=11)

2.2.2 40 percent have a bond brokerage network with less than five counterparties

Figure 14 shows the number of counterparties that the survey participants indicate to maintain in order to execute bond orders. 39 percent have a bond brokerage network containing less than five parties, 35 percent have between 5 and 15 counterparties and 26 percent state to maintain relationships to more than 15 opponents.

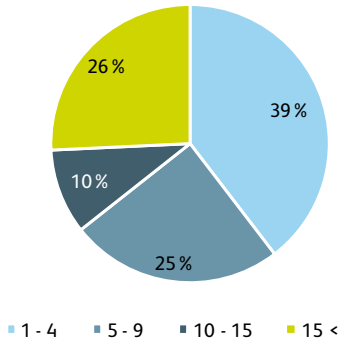

Figure 14: Number of counterparties for trading bond orders
(n=101)

The group maintaining a network with more than 15 counterparties (=26 firms) is structured as follows: Nine private banks, seven cantonal banks, five asset managers, four securities dealers and one large bank. If we take the AuM into consideration, we can observe that especially smaller companies with less AuM tend to have fewer counterparties: 70 percent of the group with less than five counterparties manage less than CHF 2 billion in assets (= 27 companies). The majority of them are regional banks (=16 firms) and FINMA-licensed asset managers (=8 companies).

2.2.3 30 percent have reduced their bond brokerage network in the last two years

As previously described, in the aftermath of the financial crisis, banks have reduced their bond inventory levels, scaled down their market-making

activities and shrunk their trading departments. We therefore asked the survey participants if these developments might have negative effects on their relationships to bond brokers. The left hand chart in figure 15 illustrates how the survey participants' bond brokerage network has developed over the last two years. 43 percent indicate that they have the same number of counterparties today than two years ago, 30 percent have reduced and 27 percent have increased the number of counterparties. The right hand chart in figure 15 visualises the survey participants' assessment of how their bond brokerage network is expected to develop in the next two years.

2.2.4 One-third indicate to shrink their bond brokerage network in future

Interestingly, 27 percent state that they have increased the number of counterparties in the past, only 11 percent believe that they will (further) enlarge their bond brokerage network in the coming two years. 32 percent even think that they will reduce the number of counterparties and that they will have a smaller bond brokerage network available in two years. This means that the majority of the respondents' brokerage networks will likely not be extended in the future while some will even shrink.

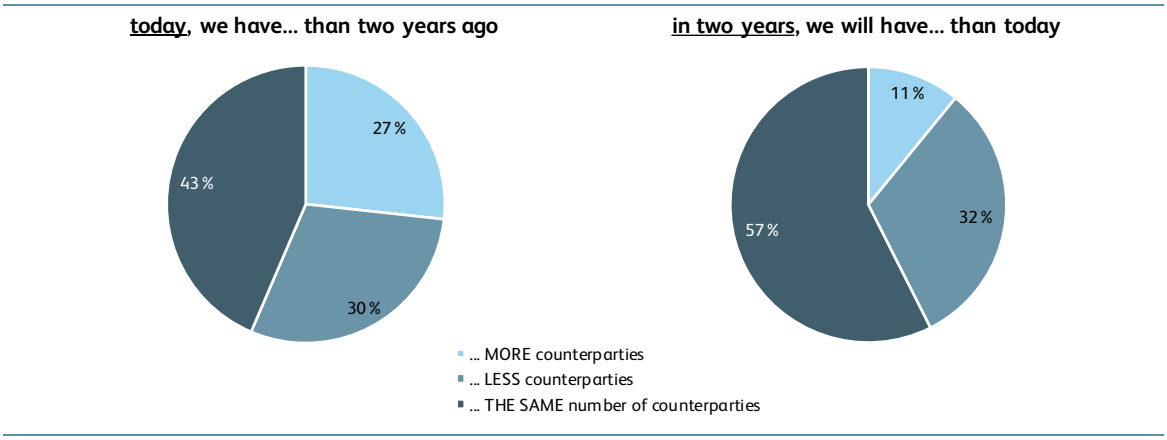

Figure 15: Development of the bond brokerage network (n=101)

2.2.5 One-third think it has become more difficult to broaden their brokerage network

Figure 16 illustrates that almost the equivalent share of participants that indicate to reduce the number of trading counterparties in the future (≈one-third) thinks that it has become generally more difficult to enlarge their bond brokerage network. The majority of participants put this down to brokers/banks having withdrawn from or downsized their bond trading activities (=53 percent) or that their requirements have become stricter (=47 percent).

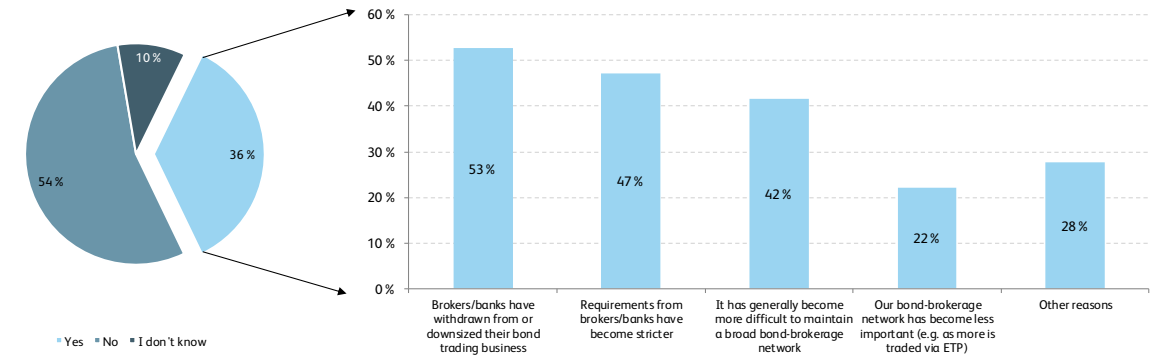

Figure 16: Question about the difficulty to enlarge a bond brokerage network and reasons for this (n=101)

2.2.6 70 percent of the survey participants trade bonds electronically

71 percent of the responding firms state that they use electronic trading platforms for placing and executing bond orders – see figure 17. Examples of such platforms are Bloomberg, MarketAxess or Tradeweb. This means that 29 percent of the firms place bond orders over other channels, for example over the phone. The group that does not use electronic trading platforms for placing bond orders is made up as follows: 18 asset managers, nine regional banks, one cantonal and one private bank.

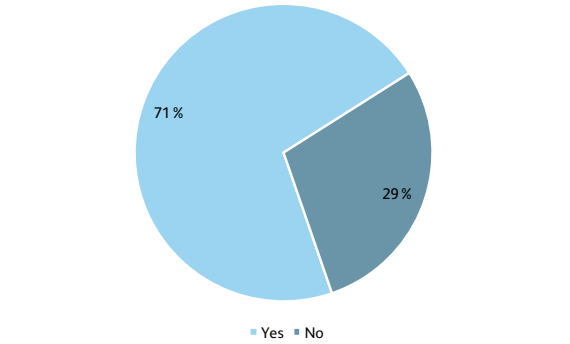

Figure 17: Do you use electronic trading platforms for placing bond orders? (n=101)

2.2.7 Respondents trading electronically trade 65 percent of their trades electronically

The questionnaire further asked the participants using an electronic trading platform how they place bond orders and requested them to split and allocate the number of trades into the following three channels: Orders placed through electronic trading platform, by phone or via other channels (e.g. instant messaging, mail). Figure 18 visualises this aggregated split: Firms trading electronically execute on average 65 percent of their trades via electronic trading platforms; 16 percent are placed by phone and 19 percent through other channels, like messaging services. It is interesting to compare these findings with other reports: According to a report from Greenwich Associate (2017a), 60 percent of the notional volume[141] in corporate bonds is traded electronically in Europe. This stands in stark contrast to the United States, where only 20 percent of the notional volume in corporate bonds is traded electronically – 80 percent is still matched and executed over the phone or via instant messenger.[142]

[141] Mind that we measure the allocation based on «number of trades» and that the share traded electronically in volume-terms is normally lower. This implies that the share of electronic trading is presumably higher among European investors.

[142] Cf. Greenwich Associate (2017a), p. 3. The report is based on 296 responses in Europe and 195 responses in the US.

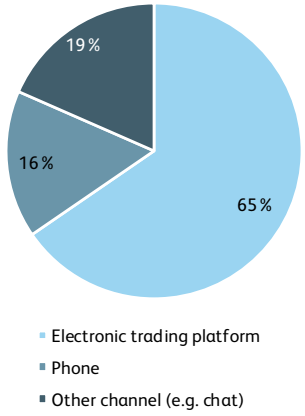

Figure 18: Average allocation of bond trades across channels
(by number of trades, n=72)

2.2.8 Bloomberg and UBS Bond Port are the most used electronic trading platforms

Figure 20 illustrates the dissemination of electronic trading platforms among the survey participants. The chart shows the following specifics: The level of penetration, the level of recognition and the percentage of respondents planning to introduce a platform. The chart excludes D2D- and SD-platforms and lists only platforms that at least one survey participant stated to know. In addition, the right hand chart in figure 19 shows the market share distribution across the trading platforms. This chart is based on the average allocation of trades across each trading platform. Figure 28 in the appendix (see page 59) describes the platforms in more detail.

It is apparent that the leading electronic trading platform among the respondents is Bloomberg. The platform allows the aggregation of prices pulled from single dealers, which enables investors to compare the (live) prices from multiple dealers. 87 percent of the participants that have an electronic trading platform use Bloomberg. The dominant position is underlined by the high level of recognition – 94 percent of the survey participants know Bloomberg – and by the relatively high number of participants indicating to introduce the platform. Interestingly, Bloomberg's A2A-trading function BBX – introduced in 2015 – is only known to 29 percent of the respondents, only six percent use the function for trading.

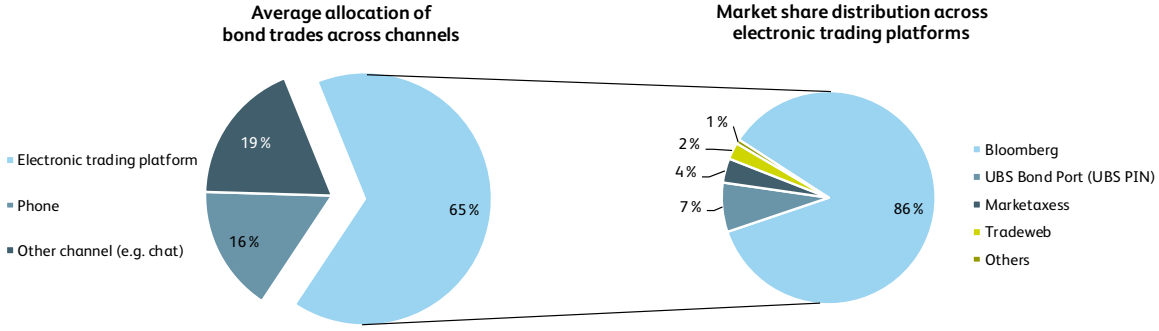

Figure 19: Allocation of bond trades across channels and market share of electronic trading platforms
(based on number of trades, n=72)

The second most used platform among the survey respondents is UBS Bond Port (formerly known as UBS PIN-FI[143]). The platform offers investors to trade directly with each other without paying a bid-ask spread to a dealer. UBS Bond Port has a market share of seven percent with 32 percent of the survey participants using the platform.

MarketAxess ranks in third place: 43 percent of the survey participants know the platform, 17 percent use MarketAxess' electronic trading platform actively and three percent are planning to introduce MarketAxess in the future. With 17 percent using the platform, MarketAxess has a market share in our sample of four percent across the electronic trading platforms.

Tradeweb with their trading platforms «Tradeweb Direct», «Tradeweb Insitutional Platform» and «Tradeweb Blast A2A» ranks in fourth, sixth and seventh place, respectively. Saxo Digital Bond Offering – which is Saxo Bank white-labelling to other banks – is used by three percent of the survey participants.

Comparing these findings with surveys among international investors, we conclude that Bloomberg has an above-average market share in Switzerland, whereas MarketAxess and Tradeweb have a comparatively low market penetration. For instance, a recent survey conducted by Greenwich Associate (2017) measures the penetration of global corporate bond venues based on 407 responses from investors in the US and Europe. Among this investor group Greenwich Associate finds that Bloomberg has a penetration of 68 percent (market share[144] = 51 percent), MarketAxess of 52 percent (market share = 38 percent) and Tradeweb of 24 percent (market share = nine percent). A trading survey from MarketAxess (2016) supports our findings of a strong market position of UBS Bond Port: Based on 70 responses from North American, European and emerging market credit desks, 44 percent of the respondents report to use UBS Bond Port.

2.2.9 Electronic trading systems and smart trading networks are rarely used

Whereas electronic trading platforms are widely used among the survey participants, smart trading networks and electronic trading systems that source, detect, aggregate and/or match liquidity are rarely used – see figure 21. Moreover, only a small number of market participants are aware of these tools.

The most recognised provider among the respondents is the bond information network Algomi, which is known by 13 percent of the respondents. However, only one survey participant indicates to use Algomi. Two respondents state that they plan to introduce Algomi's solutions.

Neptune Networks ranks in second place among the most popular data solution provider with seven percent claiming to know the network. Among the survey participants, four respondents intend to introduce the solution from Neptune Networks, which makes it the most frequently named system planned to be implemented among surveyed bond traders.

[143] Price Improvement Network for Fixed Income Products. Today integrated into UBS Neo.

[144] Volume-weighted, according to Greenwich Associate (2017).

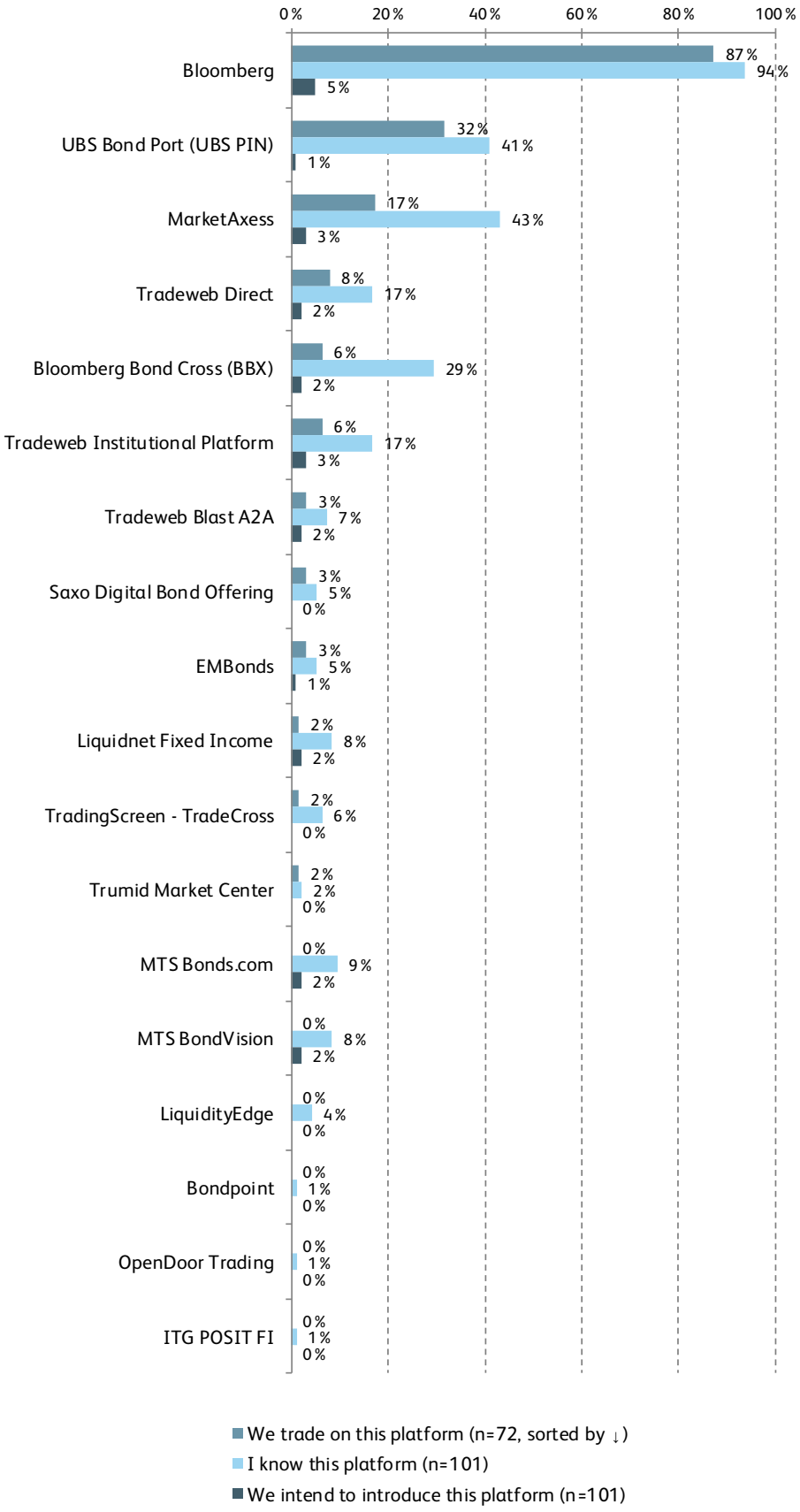

Figure 20: **Electronic trading platforms – penetration, recognition and the popularity of introduction**
(exkl. D2D- and SD-platforms, only platforms shown with recognition >0 percent, penetration based on usage)

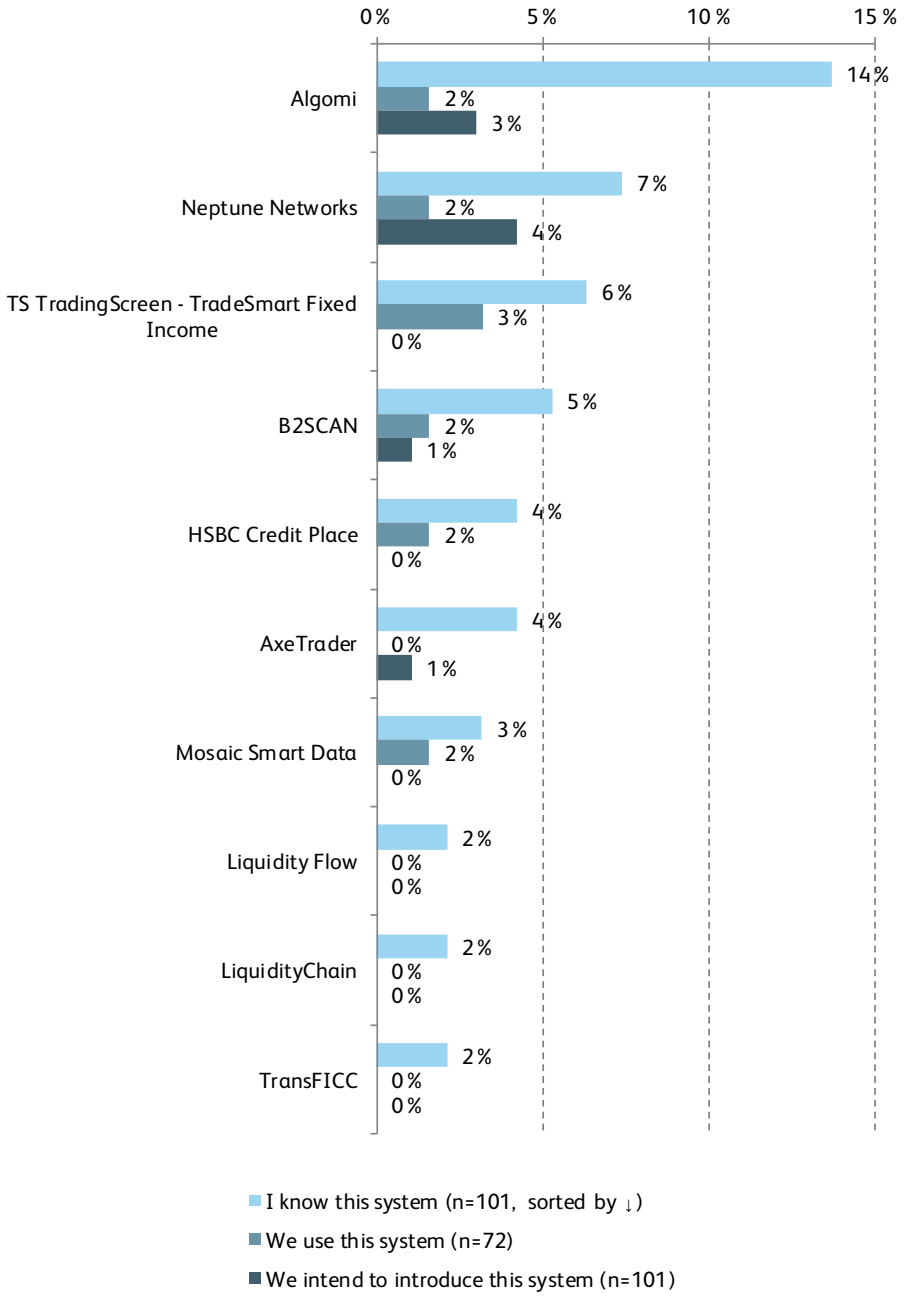

Figure 21: Smart trading systems/networks – recognition, penetration and the popularity of introduction

45 percent «sometimes» have difficulties to trade bonds due to insufficient liquidity

Figure 22 sheds some light on the question as to how frequently survey participants face difficulties to trade bonds due to insufficient market liquidity. The participants were asked to state their assessment on a symmetric, five-stage Likert scale ranging from «never» to «very often».

45 percent of the respondents state to «sometimes» face difficulties to buy/sell bonds due to a lack of liquidity; 37 percent «never or rarely» face problems. Only 18 percent indicate that they «often or very often» have difficulties trading bonds due to insufficient liquidity.

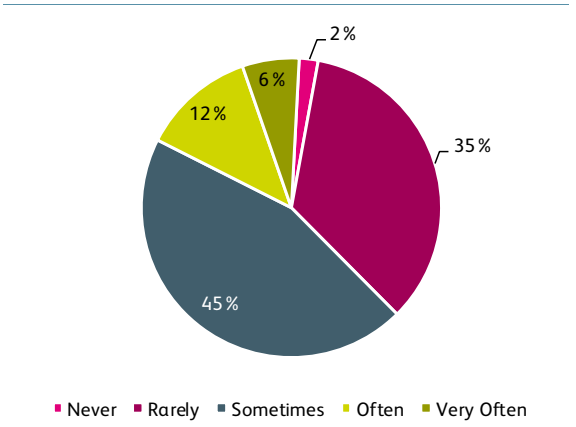

Figure 22: **Do you face difficulties to trade bonds due to insufficient liquidity?**
(n=101)

2.3 Descriptive statistics for correlating responses

The following chapter relates the findings from the previous chapter with each other. We illustrate the findings based upon visual charts. The main objective of this section is to describe the relationship between the market participants' trading infrastructure and the frequency of liquidity problems. Moreover, the chapter shall give an insight to the question if firms with a technologically less advanced trading infrastructure face more liquidity problems than those with a broader market access with a better-developed trading infrastructure.

We would like to point out that we did not test the findings on statistical significance. As a result, we do not generalise the results beyond the sample and we therefore limit our conclusions solely to the 112 survey participants.

2.3.1 The more AuM respondents have, the more advanced is their trading infrastructure

Figure 23 visualises the relationship between the assets under management (AuM) of the survey participants and their trading infrastructure. The left hand chart indicates that the more AuM participating firms have, the more counterparties tend to be available for trading bonds. For instance, whereas 91 percent of the companies that manage more than CHF 15 billion in assets have a bond brokerage network with more than 15 counterparties, only 18 percent of the participating firms with AuM of CHF 2–5 billion retain such a large brokerage network. 58 percent of the respondents that manage less than CHF 2 billion assets have even fewer than five brokers for trading bonds. Moreover, the right hand chart in figure 23 indicates that we can observe a positive correlation between the AuM of a company and the possession of an electronic trading platform in our survey sample. More precisely, whereas 91 percent of all participating firms with more than CHF 15 billion AuM use electronic trading platforms, only 48 percent of the firms with less than CHF 2 billion trade electronically.

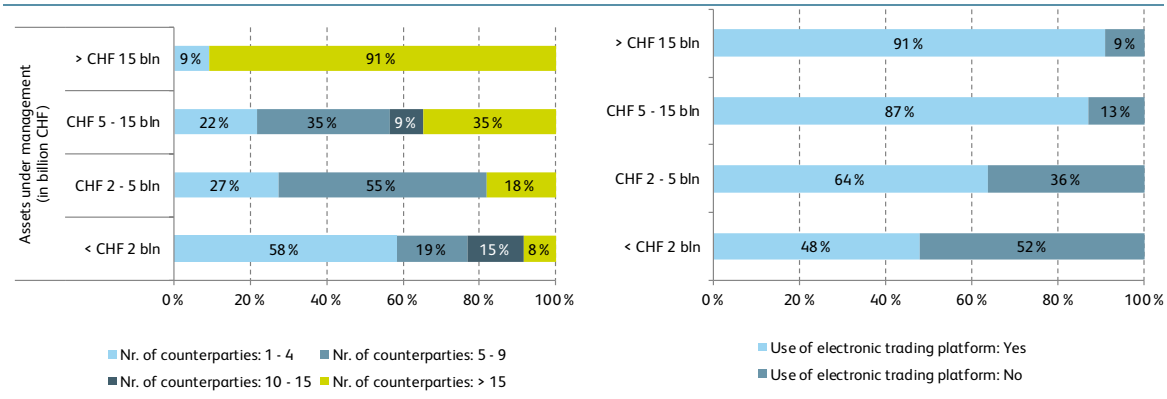

Figure 23: **Number of counterparties (left chart) and the use of electronic trading (right) depending on AuM**

2.3.2 The less advanced the trading infrastructure, the more liquidity problems

As described, we asked the survey participants to indicate their liquidity assessment to a symmetric, five-stage Likert scale ranging from «never» to «very often». This ordinal scale allows the description of those survey participants that face liquidity problems on an above or below average basis.

The two charts in figure 24 put the number of counterparties and the use of an electronic trading platform in relation to the frequency of liquidity problems. The left hand chart indicates a negative correlation between the number of counterparties and the frequency of liquidity problems. Specifically, 52 percent of the survey participants that have more than 15 counterparties available for placing bond orders indicate to «never» or «rarely» face liquidity problems. This number decreases to 26 percent in the group of firms that have a bond brokerage network with only 5–9 opponents. Even more importantly, survey participants with less than 15 counterparties available state that they «often» or «very often» face liquidity problems. For example, 35 percent of the respondents that have between 5–9 counterparties state to «often» or «very often» face liquidity problems.

The right hand chart in figure 24 visualises the relationship between the use of electronic trading platforms and the frequency of liquidity problems. The chart indicates that those survey participants who use an electronic trading platform tend to face less liquidity problems. For instance, 24 percent of the respondents with no electronic trading platforms in place state to «often» or «very often» encounter liquidity problems. This number decreases to 15 percent in the group of respondents using an electronic trading platform.

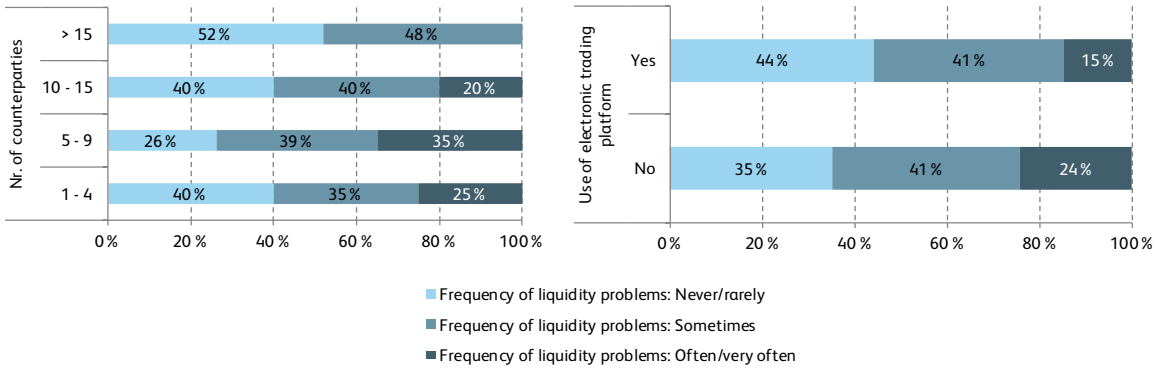

Figure 24: The frequency of liquidity problems depending on the number of counterparties (left chart) and the use of electronic trading platforms (right)

2.3.3 Survey participants with less AuM, have more often problems to source liquidity

Figure 25 illustrates the relationship between the frequency of liquidity problems and the AuM the participating firms indicate to have. A rather surprising observation is that especially smaller firms in terms of AuM state to «often» or «very often» encounter liquidity problems. On the other hand, none of the participating firms managing more than CHF 15 billion assets (=11 participants) indicate to «often» or «very often» face problems to source liquidity. This is a rather remarkable observation to us as firms with more AuM tend to have larger trade-tickets that are often more difficult to trade. One might state the hypothesis

that the respondents' liquidity problems are not caused by the market but rather by the limited market access that these survey participants tend to have.

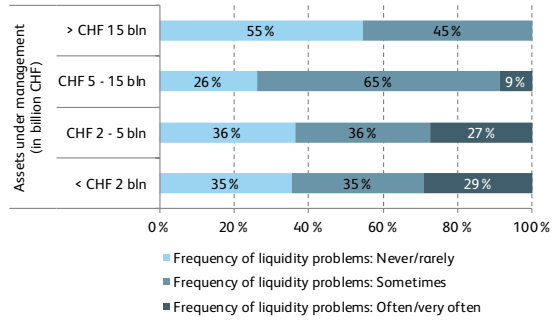

Figure 25: The frequency of liquidity problems depending on the assets under management

2.3.4 Respondents trading more frequently by phone, face more often liquidity problems

Figure 26 illustrates the share of trades placed via the phone («voice-based»-trades). The left hand chart shows the share of trades placed on a «voice»-basis, relative to the AuM. It illustrates that as the AuM of a firm increases, the lower the share of «voice-based»-trades For instance: All survey participants that manage more than CHF 15 billion assets, trade less than 20 percent of all trades via the phone. This share is inversely related to the AuM managed by these firms. For instance: 40 percent of the survey participants that indicate to manage less than CHF 2 billion, place more than 20 percent of all trades over the phone.

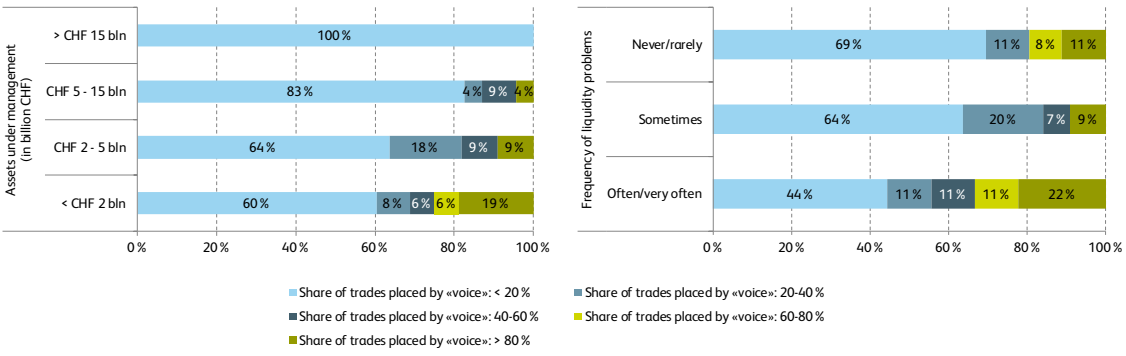

Figure 26: Share of «voice»-trades relative to AuM and in relation to the frequency of liquidity problems

The right hand chart in figure 26 shows the share of «voice-based»-trades relative to the frequency of liquidity problems. The chart suggests that survey respondents «often» or «very often» facing problems to source liquidity, place a relatively high share of trades over the phone. An explanation could be that trading via the phone is costly and time-consuming since investors need to contact their brokerage network manually to ask for quotes which causes high «search costs».[145] This narrow access to bond markets with a relatively small OTC-trading infrastructure might be a reason why smaller companies indicate to face problems to find a trading partner more often.

2.3.5 Respondents with more AuM introduce more likely new trading platforms

Finally, figure 27 illustrates the group that intends to introduce new electronic trading platforms. On the one hand, survey participants «often» or «very often» facing liquidity problems tend to be more

[145] See also Duffie (2012) showing that dealer-intermediation requires significant search costs.

likely to introduce a new trading platform (=31 percent) than those indicating to «never» or «rarely» have had any problems to trade bonds due to subdued liquidity levels. On the other hand, participating firms managing more assets tend to indicate the intention to introduce new trading platforms more often – see right hand chart in figure 27. For instance, 64 percent of the companies with more than CHF 15 billion AuM state the intention to introduce new electronic platforms. This proportion shrinks to 12 percent in the group of respondents managing less than CHF 5 billion.

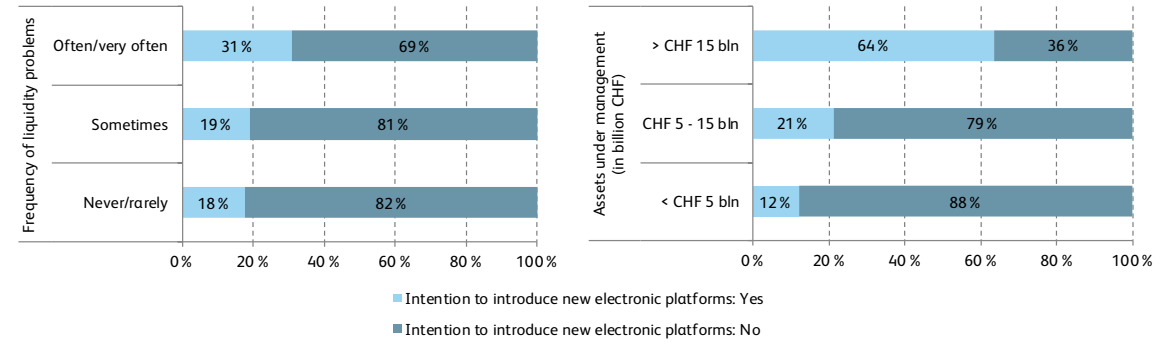

Figure 27: Intention to introduce new trading platforms

Conclusion and outlook

Bond markets have changed fundamentally; today technology is key to access and trade liquidity

Over the last two decades, bond markets have evolved considerably in many respects: Market players are increasingly interconnected, trading is progressively technology-driven and the traditional roles between investors and dealers are more and more blurring. It is evident that bond markets are evolving and that the level of complexity for trading bonds is steadily increasing. As a result, a «state of the art» trading infrastructure, combined with the appropriate brokerage network in place, is of paramount importance for market participants in order to access and trade the required liquidity. On the one hand, technology supports market participants in handling trades more efficiently through an order's life cycle. On the other hand, technology enables investors to detect and access additional pools of liquidity, which would not be accessible without the right tools and technological innovations in place. Moreover, ongoing regulatory initiatives are enhancing market transparency and contribute to an environment in which the processing of data and market information are playing an ever more important role. As a result, bond markets have reached a degree of complexity that investors are hardly able to handle without the appropriate technology in place. In short: Technology is key to efficiently detect, aggregate and trade liquidity in today's bond market structure.

Larger firms have more advanced trading infrastructures; they tend to face less liquidity problems

Our survey from 112 Swiss-based investors active in bond trading shows that the level of technological adoption varies depending on the size of the market participants. In our sample, larger firms tend to have a more advanced trading infrastructure with a broader network of trading counterparties and a higher penetration of electronic trading platforms. Interestingly, these companies trade a smaller portion of «voice-based»-trades and tend to trade a larger share of their orders electronically on trading platforms. Moreover, companies in our sample having more asset under management tend to face less problems trading bonds due to subdued liquidity levels. This is interesting since one would expect that bigger firms tend to have larger trade-tickets and, as a result from, more often face problems in finding trading opponents.

Smaller firms have a more narrow market access; they tend to face liquidity problems more often

Survey participants with less assets under management more often indicate to face problems with the execution of bond orders due to insufficient liquidity. A possible explanation stems from the fact that their trading infrastructure is less advanced in terms of the width of their brokerage network and their access to electronic trading platforms. In our sample, smaller firms tend to trade a higher share of trades over the phone and tend to maintain a smaller bond brokerage network with fewer counterparties. This narrow access to bond markets with a relatively small, OTC-driven trading infrastructure might be a reason for smaller companies indicating to have more often problems with finding liquidity. This explanation is supported by the fact that transaction costs for bonds tend to be higher when

bonds are traded by «voice» as opposed to being traded electronically on a multilateral basis. The differences in trading costs are larger, the smaller the trade sizes are. Since respondents with less assets under management have a higher share of «voice-based»-trades and typically trade smaller sized orders, these survey participants tend to pay relatively high transaction costs. The elevated transaction costs for trading bonds might lead to these respondents being affected by liquidity problems more often.

10 percent have outsourced the execution of bond orders; this share will likely increase in the future

A possible consequence of these «liquidity challenges» is that firms outsource the execution of bond orders – 10 percent of our survey participants indicate that they have delegated the execution of bond orders to an external trading desk. This share might grow in the future since one-third of the respondents not only indicate that it has become more difficult to maintain their bond brokerage network in the last two years, but also expect that they will reduce their bond brokerage network in the next two years. This holds especially for smaller firms with lower transaction volumes.

70 percent of the respondents trade electronically; 65 percent of the orders are traded electronically

An aggregated view on the level of technological adoption shows that more than 70 percent of the survey participants trade electronically. Within this group, on average 65 percent of all orders are traded via electronic trading platforms; 16 percent are traded by phone and 19 percent through other channels like messaging services. Comparing the level of electronification of bond trading in Switzerland with other regions is methodically difficult, as most reports use «traded volume»-terms and often differentiate between different investors or bond types (e.g. high-yield and investment-grade). Nevertheless, we conclude that the share of electronic trading among the Swiss survey participants is lower compared to European investors, who trade 60 percent of the notional volume in corporate bonds electronically. Since these 60 percent are measured in «volume»-terms, we may assume that this figure is higher considering «number of trade»-terms. A possible explanation is that Swiss investors tend to be of smaller size and as we know from our survey sample, smaller firms tend to transact a smaller portion of their trades electronically. This might result in a lower share of electronic trading in Switzerland compared with investors in Europe. On the other hand, when comparing the results with investors in the US, which trade only 20 percent of the notional volume in corporate bonds electronically, the share of electronic trading in our sample tends to be higher.

Bloomberg is the leading trading platform among the respondents with a market share of 86 percent

As described in part I of the report, we label the electronification of bond trading in the last two decades as the *first phase* of bond market's evolution. This development has not only brought up a vast number of different electronic trading venues – we detect 33 platforms – but has also increased the interconnectivity among market participants. Today, investors have access to a broader network of liquidity providers via electronic trading platforms and are less reliant on the sole, limited set of dealer-counterparties. Based on our sample, we conclude that Bloomberg is the undisputed market leader for those survey participants that use electronic trading platforms. 87 percent of the survey participants trading electronically use Bloomberg. Considering the number of trades that the respondents indicate to trade on Bloomberg, we estimate a resulting

market share for Bloomberg of 86 percent. UBS Bond Port ranks second (32 percent market penetration; 7 percent market share), followed by MarketAxess (17 percent; 4 percent) and Tradeweb Direct (8 percent; 2 percent).

Electronic trading systems and smart trading networks are rarely used (yet)

As further outlined in part I, we argue that the *second stage* of bond markets' evolution will be heavily driven by data analytics and smart information networks. Since the landscape of trading platforms is fragmented, liquidity is often broadly distributed and, as a result, its detection and aggregation is difficult without the appropriate technology in place. Moreover, ongoing regulatory initiatives are enhancing market transparency and contributing to an environment where the processing of data and market information is playing an ever more important role. Therefore, it is well justified that «big data» and the smart analysis of information will play an increasingly important role in facilitating bond market liquidity in the future. We detect ten trading systems and smart information networks that try to source, detect, aggregate and match liquidity across various channels. However, our survey results indicate that these tools are rarely recognised and hardly used among the responding companies. As a result, we conclude that the participating firms have not adopted these technological innovations and thus have not yet stepped into the second phase of the bond market's evolution.

The adoption of technological trading innovations is of general economic interest

We expect that the likely winner in the race to effectively utilise data are the market participants that do not only use the appropriate analytical technology to detect and aggregate liquidity, but also have the required order execution technologies in place to transform liquidity into trades. Therefore, it is important that market participants actively adopt technologies in order to find liquidity in the required scale and to trade this liquidity in the appropriate place and manner. Moreover, since technology is able to reduce trading frictions and thus contribute to economic welfare, it is of general economic interest that local investors actively adopt to technological trading innovations.

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Appendix

Platform ↓	Description	Trading connectivity	Eligible participants
BGC Trader	BGC provides electronic trading services for various financial products through BGC Trader, a multi-asset hybrid offering for voice and electronic execution. Products supported include government and corporate bond markets.	D2D	Dealers
Bloomberg ALLQ	The Bloomberg ALLQ platform provides a full view of dealer liquidity available in the market. It allows end-users to compare and trade live streaming prices from multiple dealers. These are aggregated prices pulled from single dealers.	D2C	Dealers, institutional and retail investors
Bloomberg BBX	Bloomberg Bond Cross (BBX) allows buy-side and sell-side participants to access European bond market liquidity. State Street will act as an impartial counterparty for each trade. As a result, participants minimise information leakage and retain anonymity throughout the execution process.	A2A	Dealers, institutional investors
Bondpoint	Virtu BondPoint delivers centralised liquidity and automated, cost-efficient trade execution services for fixed income securities. Buy and sell side traders enjoy efficient, direct market access. The electronic marketplace links more than 400 financial services firms to 200'000 live and executable bids and offers.	D2C	Dealers, institutional and retail investors
BrokerTec	BrokerTec is an anonymous dealer-to-dealer electronic trading platform for the fixed income markets, providing innovative technology solutions across a wide range of products. BrokerTec facilitates trading solutions for many US and European fixed income products.	D2D	Dealers
BrokerTec Direct	BrokerTec Direct offers a disclosed trading execution platform. It is a dealer-to-client platform that offers relationship-based electronic trading for fixed income instruments.	D2C	Dealers, institutional investors
Candeal	CanDeal has assembled Canada's deepest liquidity pool for Canadian debt securities. Institutional investors from around the globe leverage CanDeal to gain direct access to their dealer network, including all of Canada's primary dealers.	D2C	Dealers, institutional investors
CastleOak DirectPool	The DirectPool platform from CastleOak connects price-makers and price-takers and optimises the price and minimises the leakage of information.	D2C	Dealers, institutional investors
Clarity BidRate	The Clarity BidRate alternative trading system creates an opportunity in the variable-rate securities market that is designed to level the playing field for issuers, investors, banks and broker-dealers. The platform gives full pricing power to investors who will be able to bid for bonds priced through a competitive bid process.	A2A	Dealers, institutional investors
Dealerweb	Tradeweb's Dealerweb offers liquidity solutions for traders in the interdealer broker marketplace. It offers a fully electronic solution that replicates the existing voice broker process for U.S. markets with anonymous central limit order book matching between dealers and market makers.	D2D	Dealers
EMBonds	As an electronic trading venue dedicated to the emerging market fixed-income space, EMBonds was launched in 2015. Employing an all-to-all model with a central clearing counterparty, the platform has a global client base ranging from hedge funds to specialist emerging market banks.	A2A	Dealers, institutional investors
Euronext Synapse	Euronext signed a partnership with Algomi. Combining Euronext's experience and Algomi's innovation technology, Euronext Synapse connects pools of liquidity and market participants anonymously in a centralised market place.	D2D	Dealers
ITG POSIT FI	ITG POSIT matches marketable orders on a size pro rata basis. POSIT provides a crossing solution to source	A2A	Dealers, institutional investors

	quality liquidity anonymously while minimising market impact.		
LiquidityEdge Direct	LiquidityEdge is a trading venue that facilitates genuine liquidity for US Treasuries. LiquidityEdge Direct provides bilateral and customisable peer-to-peer streaming on a fully disclosed basis.	A2A	Dealers, institutional investors
LiquidityEdge Select	LiquidityEdge is a trading venue that facilitates genuine liquidity for US Treasuries. LiquidityEdge Select provides anonymous trading facilitated by a fully-disclosed clearing counterparty.	A2A	Dealers, institutional investors
Liquidnet Fixed Income	Liquidnet Fixed Income offers two distinct yet complementary ways of efficiently accessing liquidity: A buy-side focused dark pool for liquidity that matches passive indications, and a lit pool that allows all participants to post firm and executable prices and exchange liquidity with each other.	A2A	Dealers, institutional investors
MarketAxess	MarketAxess' electronic trading platform enables institutional investors and broker-dealers to efficiently trade corporate bonds and other types of fixed-income securities. They offer a global all-to-all institutional credit trading marketplace. MarketAxess' Open Trading allows investment managers, broker-dealers and other market participants to trade directly with one another electronically on an anonymous basis.	A2A	Dealers, institutional investors
MTS Bonds.com	MTS Bonds.com, previously known as BondsPro, is an electronic trading platform that offers access to liquidity and real-time execution on its anonymous, all-to-all order book. It supports USD and a wide range of non-USD denominated corporate bonds and emerging market debt.	A2A	Dealers, institutional and retail investors
MTS BondVision	MTS BondVision is a regulated and secure multi-dealer-to-client trading platform for government bonds and credit that connects investors to dealers across Europe and the US.	D2C	Dealers, institutional and retail investors
MTS Cash	MTS Cash offers a liquid, transparent and efficient European interdealer bond marketplace.	D2D	Dealers
OpenBondX	OpenBondX operates an all-to-all trading platform for trading US treasuries and corporate bonds. The platform enables subscribers either to disclose themselves to particular parties, or remain anonymous when initiating orders.	A2A	Dealers, institutional investors
OpenDoor Trading	OpenDoor is an all-to-all session-based trading platform and fills the liquidity vacuum for Off-the-Run US Treasuries and TIPS. Customers include asset managers, central banks, primary dealers, hedge funds, and trading firms.	A2A	Dealers, institutional investors
Saxo Digital Bond Offering	Saxo Bank's digital bond trading solution eliminates manual processes. It gives investors direct access to a universe of over 5'000 bonds. Orders are routed straight to an optimised dealer auction where the top end of 40 liquidity providers compete for orders.	D2C	Institutional and retail investors
SGX's Bond Pro platform	Singapore Exchange (SGX) has launched an over-the-counter (OTC) trading platform dedicated to Asian bonds. The SGX Bond Pro trading venue aims at tackling institutional liquidity challenges within the secondary Asian bond market by re-aggregating liquidity, providing increased protection to institutional investors and facilitating greater trade sizes.	D2D, D2C	Dealers, institutional investors
SIX Corporate Bonds	SIX Corporate Bonds is a credit trading platform that allows credit traders to efficiently source liquidity in large ticket sizes with minimal information leakage to the broader market. Algomi was selected as the technology partner.	D2D	Dealers
Spain SENAF	SENAF (Sistema Electrónico de Negociación de Activos Financieros) is the Bolsa de Madrid's (BME) electronic trading platform for Spanish Public Debt, reverse repos and specific securities registered on AIAF.	D2D	Dealers
Tradeweb Blast A2A	Tradeweb Blast A2A solution allows clients to send a request for quote to a larger and more diverse network, also integrated with the Tradeweb Direct liquidity pool. Buy-side firms can participate in the Blast A2A as well.	A2A	Dealers, institutional and retail investors

Tradeweb Direct	An electronic fixed income marketplace for financial advisors, registered investment advisors, traders, and buy-side investors. Tradeweb Direct offers a full range of front-end and workflow solutions, providing users with pools of liquidity and the tools they need to manage order flow, ensure competition, and mitigate risk.	D2C	Dealers, institutional and retail investors
Tradeweb institutional platform	The Tradeweb institutional platform grants global access to leading dealers. The multi-dealer platform puts dealers in competition; trading protocols are tailored for each marketplace.	D2C	Dealers, institutional investors
Trumid Market Center	The Trumid Market Center is an all-to-all electronic trading network and market intelligence platform for corporate bonds. The acquisition of Electronifie is expected to give Trumid 60 new customers.	A2A	Dealers, institutional and retail investors
TS TradingScreen – TradeCross	TradeCross allows members to post their liquidity anonymously in a central place. TradeCross is completely anonymous, and protects members from counter-party risk. TS is in a unique position to provide a fair and efficient crossing environment where all participants can interact with each other.	A2A	Dealers, institutional investors
UBS Bond Port	UBS Bond Port is a matched principle trading venue where clients can access various sources of liquidity: From other UBS clients, other third-party venues and investors.	C2C	Institutional and retail investors
Yieldbroker	Yieldbroker operates an electronic exchange for Australia's interest rate market. It's a place where banks, asset managers, insurers, central banks and governments go to trade local debt securities and derivatives.	D2D, D2C	Dealers, institutional investors

Figure 28: List of electronic bond trading platforms
(Source: Own research, descriptions from company websites)

System ↓	Description	Eligible participants
Algomi	Through their Honeycomb, Synchronicity and Algomi ALFA technology, Algomi creates a bond information network that enables all market participants to securely and intelligently harness data to make valuable financial trading connections.	Dealers, institutional investors
AxeTrader	AxeTrader provides banks, broker-dealers and buy-side firms with a complete picture of fixed income liquidity including axes, runs and quotes – sourced across electronic venues, messaging platforms and voice channels.	Dealers, institutional investors
B2SCAN	B2SCAN is a tool designed to help asset managers search and identify the sell side's bond axes. It collects market information and controls who accesses the data. It adds liquidity to the market and increases the flow of business.	Dealers, institutional investors
HSBC Credit Place	HSBC Credit Place is a D2C and C2C electronic liquidity aggregator. The platform displays streamed prices from various sourced (e.g. indications of interest from dealers and clients). Trading execution does not take place on the platform but outside through existing channels.	Dealers, institutional investors
Liquidity Flow	Liquidity Flow offers transparency of prices, greater control, speed of execution and full anonymity to its participants. It is a buy-side trade matching and pre-trade axe investigation platform. It is offered by Liquidity Finance.	Institutional investors
LiquidityChain	LiquidityChain provides an information and crossing network that anonymously searches and mines client IOIs (Indication of Interest) to a pairing engine. Once an opposite match is lit, it is flagged to an execution desk whose aim is convert these matches into trades.	Institutional investors
Mosaic Smart Data	Mosaic Smart Data enables banks to harness the increasing volume of trade data they hold and apply cutting-edge technologies such as predictive analytics and artificial intelligence. This allows sales, trading, management and compliance teams to better understand, monitor and anticipate their clients' needs.	Dealers

Neptun	Neptune delivers bond market data from sell-side banks to buy-side clients. Their technology enables real-time connectivity between banks and investors which leads to conversations, satisfying the immediate requirements of each party and ultimately, increasing trade volumes.	Dealers, institutional investors
TransFICC	TransFICC offers a solution that enables investors to connect and trade on multiple FICC trading venues. They translate the various trading venue API's into the format used by TransFICC, to allow for single integration. They centrally collect data in the fragmented fixed income market.	Dealers, institutional investors
TradingScreen – TradeSmart Fixed Income	TradeSmart FI addresses the buy-side's data fragmentation issue and provides tools to decide how to execute trades. TradeSmart FI comes with all the connectivity to allow accessing an aggregated feed to more than two million corporate, financial, and government bonds on one screen.	Dealers, institutional investors

Figure 29: List of electronic trading system
(Source: Own research, descriptions from company websites)

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