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Electronic Trading Platforms in Government Securities Markets

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ELECTRONIC TRADING PLATFORMS

IN GOVERNMENT SECURITIES MARKETS

BACKGROUND NOTE

This note on electronic trading platforms in government securities markets is part of a series of background notes produced under the Gemloc Advisory Services Program as a by-product of its strategy to support the development of liquid local currency bond markets. Selected topics have been a key focus in the areas of work of the Advisory Services because of their catalytic impact on debt market development. They include primary market organization through primary dealers; liability management; repo markets; domestic syndications; price dissemination and clearing and settlement arrangements.¹

Electronic trading platforms can make a substantial contribution to development of government securities markets when trading volumes have reached (or have a potential to reach) a certain minimum critical mass. Electronic trading platforms enhance secondary market liquidity in several ways. These include a more efficient primary dealers system, as an electronic trading platform allows streamlined monitoring of primary dealers' abidance with their price quoting obligations. The purpose of this background note is to provide some guidance on how a government debt management office can play a proactive role in bringing electronic trading platforms to a government securities market in an efficient way to support its development.

¹ This background note has been prepared to support the World Bank technical assistance programs for the development of local capital markets. It is a work in progress (particularly, for the country case studies) and as such should not be quoted. This note will serve as a basis for a forthcoming handbook on Electronic Trading Platforms. Comments to asilva3@worldbank.org, cgarciakilroy@worldbank.org, oakcadag@ifc.org or baudouin.richard@live.be are welcome;

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ABBREVIATIONS AND ACRONYMS

B2B	Business to Business
B2C	Business to Customer
CCP	Central Counterparty Service
COB	Central Order Book
DMO	Debt Management Office (or its equivalent)
ETP	Electronic Trading Platform
GS	Government Security/Securities
EME	Emerging Market Economy
EMU	European Monetary Union
IDB	Inter-Dealer Broker
MiFID	Markets in Financial Instruments Directive 2004/39/EC
MM	Market Maker
MTF	Multilateral Trading Facility
OTC	Over the Counter
PD	Primary Dealer
RFQ	Request for Quote
SE	Stock Exchange

EXECUTIVE SUMMARY

The objective of this background note is to provide some guidance to a Debt Management Office (DMO) seeking to launch an electronic trading platform in a government securities market, taking in consideration the experience gained by other DMOs abroad.

Electronic trading platforms (ETPs) are one of the most important components in the organization of efficient secondary markets for government securities (GS). ETPs enhance market liquidity as they improve price transparency, lower trading costs² and foster competition. ETPs coexist with other trading platforms. They are closer to over-the-counter markets (OTC) in terms of rules, participants and volumes than to Organized Exchanges. Yet, they are not substitutes for OTC markets. ETPs may have a larger or smaller share than an OTC market depending on market conditions.³

The trade-off between liquidity and transparency as well as the pace of change towards higher transparency are particularly important in the emerging market economies (EMEs). Regulators drafting provisions to ensure investors' protection should carefully consider the implications of the complex relationship between liquidity and transparency in the GS market. Developing ETPs in EMEs needs to follow ad-hoc solutions for each market and be a part of dynamic approach as the market evolves.

DMOs need to think of the role of ETPs as part of their global Primary Dealer (PD) program. ETPs allow DMOs to monitor compliance by PDs with their market making obligations. Enforcing trading obligations through ETPs should be accompanied by a comprehensive strategy by the DMO in both primary and secondary markets. This strategy includes implementing a benchmark issuance policy, providing tools to PDs for trading risks' management and granting performance incentives to PDs.

DMOs have to play a proactive role with respect to ETPs. They should closely coordinate with their PDs on the selection of ETP(s) on which they will quote and on the design of the applicable trading rules. Providers of ETPs can be a number of entities: a single bank, a group of banks, an international development bank, a central bank or an Organized Exchange. ETPs need to be designed accounting for specificities of Government bond markets in terms of members, trading rules and fees. An Organized Exchange is a service provider competing with the other service providers.

DMOs are confronted with a number of strategic and operational issues when putting an ETP in place. Strategic decisions include, among others, building or leasing an ETP, defining the PDs' market making obligations, allowing PDs to perform their market making duties on one single ETP or on several ETPs. An overview of these strategies and how they have been implemented in different countries is provided in this background note.

The appendix to the background note includes some country case studies outlining different ways of organizing trading on ETPs.

² Provided trading volume has reached (or has a potential to reach) a certain minimum critical mass;

³ OTC trading tends to become dominant in times of high market volatility;

INTRODUCTION

The use of ETPs in trading GS is a relatively recent development. It began in 1989 in Europe with the establishment of MTS Italy. It became widespread in the Western Europe in early 2000s. Currently, in virtually all mature markets GS are traded on ETPs in parallel with OTC markets, which generally have larger trading volumes. An increasing number of emerging market countries, particularly in Asia and Latin America, are using or planning to use ETPs in their domestic GS market.

The introduction of ETPs in a GS market often reflects the active involvement of the relevant DMO. The objective of this background note is to take advantage of experience of markets where ETPs have been successfully introduced to assess the most efficient ways for enhancement of the secondary market liquidity through the use of ETP.

This background note is organized as follows. First, we define ETPs and summarise the ways they enhance liquidity in the secondary market of the traded financial instruments. Then, the note is divided in three parts. **Part I summarizes a market context in which ETPs are used.** It reviews the importance of liquidity in the secondary market and specificities of the government bond market. Then the note provides a description of trading venues that can co-exist alongside ETPs, followed by a discussion of types of trading models, with the objective to assess relative advantages and complementarities of such trading venues and models. In parallel, the note provides some references to procedures applied to equities on Stock Exchanges in view of the mutual influence between bond and equities trading models. **Part II focuses on the use of ETPs specifically in the GS market.** The note provides analysis of the different types of ETPs and designs a roadmap for DMOs to put an ETP in place. **Part III includes some country analyses in appendices.** The objective is to review different ways in which ETPs can be organized. The sample of surveyed countries includes both mature and emerging markets. Parts II and III have been designed as standalone parts so as not to require prior reading of Part I for the wider policy context.

DEFINING ELECTRONIC TRADING PLATFORMS

An electronic trading platform (ETP)⁴ is a subset of an electronic trading system. An electronic trading system⁵ is a facility which provides some or all of the following services: (i) order routing (from computer to computer); (ii) order execution (“click-and-trade”); (iii) credit risk management (central counterparty trading); (iv) automated trade settlement (straight-through processing); and (v) dissemination of pre-trade and post-trade information.

ETP is an electronic trading system which provides a matching engine to pair buyers and sellers as a computer ranks orders by price levels and timing of inputs, which further facilitates trading between multiple parties. When orders are matched, the execution of a trade can either require a manual intervention (click and trade) or be automatic (cross-matching). In any case, an ETP requires a market regulation, detailing who can access the ETP, which instruments can be traded, the trading rules and the supervision of the market. An ETP is often referred to as a multilateral trading facility (MTF).⁶ ETPs are generally self-regulated organizations.

Advantages

ETP can increase a trading volume by reducing trading costs and trading risks. ETP reduces trading costs both in the front office and in the back office. First, click-and-trade lowers transaction costs and a further economy of scale is achieved through the use of ETP, as the platform enables one trader to monitor several markets simultaneously given the automated calculation of market prices. Second, ETP, when combined with straight-through processing, lowers settlement costs. In both cases, the marginal cost of additional trading volume is reduced. **ETP also reduces trading risks.** It makes the market more transparent by displaying market prices (both pre- and post- trade) and market depth (transaction reporting). It facilitates the transfer of information by putting in place a cheaper communication network and allows a market-wide integration of real time information. In particular, ETPs and market making ensure that (i) pre-trade information in the wholesale market is easily accessible; (ii) the posted prices can be considered technically correct as their formation is centralized through continuous market making, thereby arbitraging away technically incorrect prices ; (iii) centralized market making makes it easier for traders to cover their positions.

The multi-dealer and cross-matching models have a centralizing effect leading to larger pools of liquidity, which in turn stimulate the use of a smaller number of ETPs, thereby strengthening the centralization trend.⁷ As a result, ETPs attract more market players including non-residents, as they enhance the symmetry of information available to market participants, a contribution to the globalization of markets.

ETPs are of particular interest to DMOs as they enhance the efficiency of PD models. ETPs are also the only efficient way for DMOs to check compliance by PDs with their market-making obligation and to appraise the quality of their trading activity in the secondary market. ETPs thereby contribute to enhancing the liquidity of GS markets.

Drawbacks

The drawbacks of ETPs are limited by comparison with the abovementioned advantages. ETPs allow trading of only standard instruments and relatively small tickets. They have low adaptability to market volatility. Both are a consequence of their high level of transparency. For dealers, ETPs have a cost which has to be amortized. Aside from the start-up cost in case of an internally built ETP,

⁴ As this wording is used in this note;

⁵ Or “electronic trading venue”;

⁶ This term was first formalized by the MiFID;

⁷ “A Primer on bond markets in Asia: Ten years after the crisis”, OECD Working Party on Public Debt Management, Hans Blommestein and S. Ghon Ree, 2009;

connectivity costs are incurred to link the ETP to computerized front office and back offices (database management). Therefore, ETPs require a certain critical mass in the volume of trading in order to be cost-effective. Compulsory market making also has a cost (the cost of accidental trades triggered by auto-matching). In addition, transparency causes narrower spreads and increased vulnerability to the “winner’s curse”. Additionally, the access to ETP is usually limited to institutional investors.

	Advantages	Drawbacks
General	<ul style="list-style-type: none"> Increases market liquidity 	<ul style="list-style-type: none"> Only standard instruments; Only relatively small tickets; Low adaptability to market volatility; Risk of technical glitches or malfunctioning
For dealers	<ul style="list-style-type: none"> Reduces some trading costs and risk of trading; Creates new profit opportunities 	<ul style="list-style-type: none"> Has start-up costs; Requires a certain critical mass of trading to be cost-effective
For customers	<ul style="list-style-type: none"> Reduces some trading costs and risk of trading 	<ul style="list-style-type: none"> Benefits are usually limited to institutional investors
For DMO	<ul style="list-style-type: none"> Lowers funding cost Enables DMO to monitor PDs’ compliance 	

PART 1: BACKGROUND OF ELECTRONIC TRADING

This part reviews the market context in which ETPs are used. It describes the importance of market liquidity and the specificities of the government bond market. Then, it analyses and evaluates advantages and complementarities of different types of trading venues which can co-exist alongside ETPs and different types of trading models.

1.1. Types of Markets

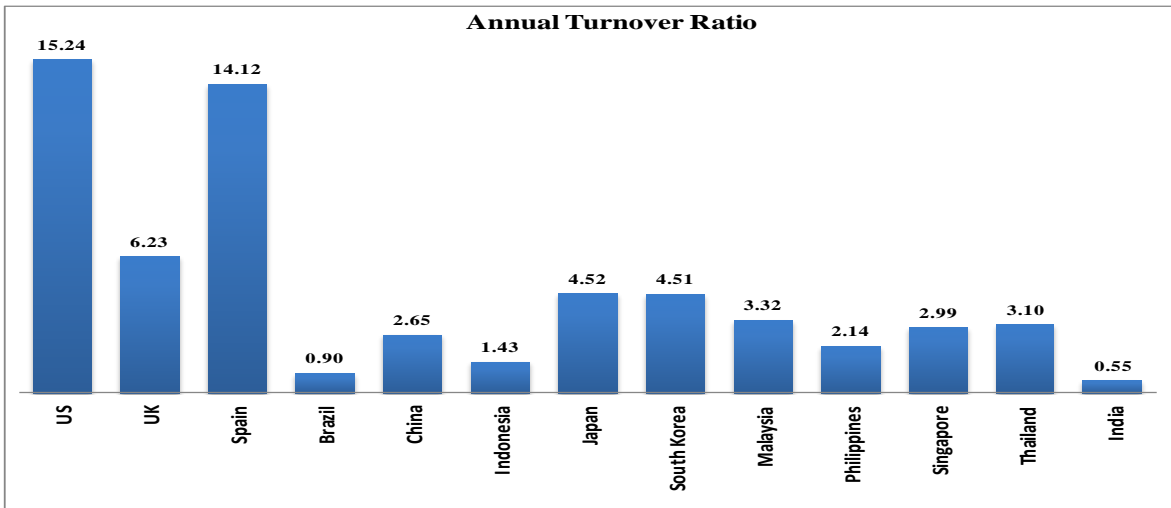
1.1.1. Importance of secondary market liquidity

A secondary market is liquid when market participants can execute large-volume transactions at low cost, fast and with no significant impact on the market prices prevailing at the relevant point in time. Liquidity is important to DMOs, leading to lower funding cost and facilitating lengthened maturities. Market liquidity is measured by tightness, depth and resilience. Tightness is the width of the spread between bid and offer prices. Depth is the size of the order that can be traded without affecting prevailing prices. Resilience is to the speed with which price fluctuations generated by trades are dissipated.

Market liquidity can be enhanced by several factors.⁸ The two factors relevant to this background note are market access and price transparency. First, a large and diversified dealer and investor base supports the heterogeneity of market prices, a key to avoiding non-tradable one-way markets. Second, the dissemination of pre-trade information (prices quoted) and post-trading information (prices and volume traded) decreases the risk of unfair prices or unethical trading practices. Such transparency encourages a larger number of investors and intermediaries to participate in the market.

An indicator of liquidity often used in the GS market is the turnover ratio - the volume traded in the secondary market divided by the outstanding amount of GS. The turnover ratio can vary significantly from one country and from one time to another.

Annual turnover ratio for selected markets in 2011



Source: The World Bank, Asian Bonds Online, Ministries of Finance and Central Banks

Note: The annual turnover numbers for Spain may include some double-counting. Please see footnote 20 below for further details.

⁸ For instance, political stability, adequate issuance policy, robust infrastructure, legal certainty, efficient clearing system, etc.;

The turnover ratio is not necessarily linked to the market share of ETPs. To illustrate, the turnover ratio in India is the lowest one in the above schedule. Yet the market share of e-trading in India is high (80%). Nevertheless, ETPs can enhance market liquidity of GS market even if e-trading is not dominant.

1.1.2. Market liquidity of bonds vs. equities

Bond and equity markets are not comparable from a market liquidity standpoint. This difference is reflected in a complex relationship between price transparency and market liquidity in the trading of GS.

Intrinsically, bonds are less liquid than equities. However counter-intuitive it appears, the logic is the following:

- (i) **Generally, an equity issuance is a one-time capital raising and no redemption is expected.**⁹ Therefore, if an investor did not participate in the initial primary offering, the only way to get hold of a particular equity instrument is to trade on the secondary market. Bonds, on the other hand, are issued and redeemed recurrently. Thus, there are more opportunities to buy them in the primary market and hold without ever trading on the secondary market, a practice known as “buy and hold”.
- (ii) **Homogeneity of common stock.** Not only is a particular common stock limited in number, but it is also homogeneous. Shares of a single issuer have identical features and are standardized. By contrast, a company can make several bond issues, each of which has a different coupon and redemption date. As a result, bond issues largely outnumber stocks.¹⁰

Yet, in practice, bonds tend to be more liquid than equities provided their issued amount has reached a certain critical mass.¹¹ The principal explanation¹² is that it is easier to make markets for bonds than for equities. When the credit rating of issuers is identical and the maturity of bonds is similar, the bonds are basically identical from a trading standpoint. A long position in bond A can be hedged with a short position in bond B. This does not apply to equities. A bond class can be traded more easily than stocks.

Differences between stocks and bonds

Stocks:	Bonds:
<ul style="list-style-type: none"> • Issued once • Perpetual • Few • Standard • Traded individually 	<ul style="list-style-type: none"> • Issued often • Redemption date • Many • Specific • Can be traded as a group

By nature, equity markets tend to be order-driven, whereas bond markets tend to be quote-driven. In an order-driven market, trades are done by matching buying or selling orders put by investors. Brokers, if any, simply put buyers and sellers in contact with each other. In a quote-driven market, dealers act on their own. Dealers make markets by continuously quoting bid and offer prices, buying and selling on their own account. When dealers trade, their objective is to find a customer with

⁹ Except in exceptional circumstances such as the company folding or buying back its capital;

¹⁰ To illustrate, the European market has more than 150,000 debt securities and approximately 6,000 shares trading on regulated markets. (Source: “An examination of transparency in the European bond markets”, Rhodri Preece, CFA Institute);

¹¹ Which is not always the case, particularly, for corporate bonds;

¹² There are other contributing factors. For example, bond markets tend to be wholesale and traded by institutional investors who actively manage their portfolio; the GS market is traded by banks to manage their cash position; GS are used to support hedging strategies, etc.;

a matching interest thereafter, not simultaneously. In the meanwhile, dealers “carry the position”. An order-driven procedure fits only liquid markets in which there is a continuous flow of orders. A quote-driven procedure is needed for illiquid markets to function efficiently in the absence of naturally matching interests.¹³

Bond markets need market makers to be liquid, with the exception of a few markets which are large, deep and liquid.¹⁴ The GS market has some specific features which make it naturally more liquid than other fixed income markets such as size, continuous flow of standardized issues; and a strong competition between intermediaries trading government securities. Nonetheless, virtually all DMOs which have appointed PDs have them perform market making functions.

1.1.3. Complex relationship between price transparency and market liquidity in quote-driven markets

Excessive transparency can adversely affect liquidity. Price transparency enhances market liquidity by decreasing the trading risk of end investors, thereby widening the investor base. However, excessive price transparency is detrimental to liquidity as it increases the risks of trading. Any dealer – including final investors – who exposes a large order to the market effectively provides all other market participants with a free option to trade against him. Excessive price transparency is particularly detrimental to market makers. Too much *pre-trade* transparency erodes the market makers’ profit margin by narrowing the spread between bid and offer prices. Too much *post-trade* transparency increases market makers’ risk of loss when covering the positions created by their market making activity.

Price transparency, both pre- and post-trade, has to be limited in order for market making to be performed efficiently. This point has been particularly well documented in the European Monetary Union during the 2007 debates on applicability of the price transparency requirements imposed by the Markets in Financial Instruments Directive (MiFID) to the GS market (Appendix 2). The outcome of the debate has been that the GS market should be exempt. In the process, the debate has further highlighted the specificity of the government bond market vs. another fixed income markets. This specificity is reviewed in the section below.

1.1.4. Specificity of GS market vs. other fixed income markets

Issuing and trading GS require fewer regulations than other financial markets with respect to price transparency and investor protection. There are fewer information asymmetries in the GS market than in other securities markets for several reasons: (i) the GS market is a highly concentrated market : there is one issuer vs. many equity and corporate bond issuers; (ii) the biggest price moving factors (the fundamentals) are public knowledge making the GS market less vulnerable to insider trading; (iii) GS yields move in tandem as the yield curve links them to each other; (iv) the GS yield curve matters to all market participants as it is a benchmark for pricing other financial assets. Therefore, a large number of market intermediaries are competing in the GS market.

In addition, the GS market is a predominantly institutional market. Retail participation is generally indirect, through pension funds, savings schemes, mutual funds, etc. The close monitoring by DMOs of their PDs’ activities also provides an extra layer of protection for investors.

¹³The difference between quote-driven and order-driven trading models is analysed in more detail in section 1.3.;

¹⁴ For example, the US, Germany;

Particular features of the government securities market

- Transparency
- Concentration (one single issuer)
- Limited vulnerability to insider trading
- Yield curve making bond prices move in tandem
- Competition between financial intermediaries
- Investor protection
- Institutional market
- Monitoring of PDs by DMO

1.1.5. DMO's involvement in the secondary market

DMOs can adopt a hands-off or a hands-on policy. To illustrate, operational models in the US and in Japan limit responsibility of a DMO to the primary market, meaning that liquidity has to be supported only by a benchmark issuance policy (“**passive secondary market**”). In the US, PDs have no market-making obligation and the Federal Reserve sees its role ending with setting the conditions of primary market issuance. In principle, the Federal Reserve is concerned only with on-the-run securities.¹⁵ In Japan, PDs have no market-making obligation either.¹⁶ In Germany, the DMO (Finanzagentur) has no officially appointed PDs.¹⁷

Most DMOs have a proactive involvement (“stimulated secondary market”). This typically implies putting in place a PD system and enforcing market-making obligations on PDs. This market-making obligation is usually defined in terms of number of hours of mandatory continuous quotation, number of securities quoted, minimum quantities and maximum spreads. However, different modalities can apply, e.g., mandatory *price quoting* on one or some specific ETP(s) or mandatory *trading* in a specific trading venue.

1.2. Types of Trading Venues

A market is a matching process. For a transaction to be concluded, a buyer and a seller have to get in contact with each other and to agree on price. The corresponding issues are to determine what kinds of trading venues and trading models best enhance market liquidity. A trading venue determines how the parties meet. A trading model determines how the market price is formed.

Financial instruments can be traded through a range of different venues. OTC markets and Stock Exchanges (SE) stand at the two extremes of the spectrum, with other trading venues in between.¹⁸ ETPs and Inter-dealer brokers are the principal examples of such other venues.

1.2.1. OTC market

OTC markets are largely informal and unregulated. The parties to a trade agree over the telephone or through some other kind of bilateral messaging system on the terms of the trade, including the

¹⁵ In practice, the recent recession shows that the Federal Reserve may have to play a more active role vis-à-vis its PDs in times of market stress;

¹⁶ Yet, both the Federal Reserve and the Japanese MoF have an active dialogue with the market about their debt management policies. The same applies to Germany even though – formally – the Finanzagentur has no PDs;

¹⁷ Yet, the Finanzagentur (DMO) has authorized a group of banks to participate in auctions. No minimum market share is required. However, the DMO takes into account the market share of the bank when allocating business to counterparties. The relationship of the DMO with these banks is closely comparable to the relationship structured by other DMOs in their PD agreements. In addition, the Finanzagentur supports market makers in the secondary market as it retains a certain amount of bonds in every auction in order to be able to release liquidity in the market when it would be needed;

¹⁸ “A Primer on bond markets in Asia: Ten years after the crisis”, OECD Working Party on Public Debt Management, Hans Blommestein and S. Ghon Ree, 2009;

clearing and settlement instructions. Each party decides on an individual basis on how to manage a counterparty risk.¹⁹

OTC markets are by nature less transparent than ETPs or stock exchanges. OTC trades are bilateral arrangements. There can be some pre-trade transparency via screens on which dealers post bid and offer prices. Yet, actual trades can be concluded at prices different from the posted prices. The trend is towards more transparency (sub-section 1.2.5.).

The OTC market can and should co-exist with other trading venues. The function and size of OTC markets varies depending on the type of investors and circumstances. As an illustration, the market share of OTC trading increases when market volatility rises.

Traditionally, fixed income products are traded on the OTC market. The main reason is the dominant market share of institutional investors (sub-section 1.1.4.). Institutional investors prefer to trade large and complex transactions directly with dealers. This is in contrast with equities that are mostly traded on Organized Exchanges.

1.2.2. Electronic trading platform

ETPs have been defined earlier. While the function of matching buy and sell orders on a multilateral basis has traditionally been assumed by regulated markets, an increasing number of privately owned multilateral trading facilities (MTFs) are currently offering to professional investors an alternative to formal exchanges.

MTFs are a relatively recent development. In Europe, they have been officially condoned in 2007 with the MiFID enactment, an important objective of which has been to ensure that SEs are put in competition with other service providers.

A major success factor in explaining the growing market share of ETPs in the fixed income market is that ETPs can be designed to represent an efficient compromise between liquidity and transparency. This compromise has generally been achieved by limiting the membership of ETPs to a relatively small group of market participants, most often composed only of market makers whose interests are reciprocal as they provide liquidity to one another. The frequent split of ETPs in two market segments – B2B and B2C – achieves the same objective of reaching a compromise between liquidity and transparency (section 2.2.).

1.2.3. Stock exchange

Stock Exchanges as referred to in this note are synonymous with Organized Exchanges.

Organized Exchanges are regulated markets where rules of access, trading and transparency are set by the market operator and approved by the regulator. A salient feature of Organized Exchanges is their high degree of transparency for both market participants and the public. In many countries, Organized Exchanges work with a central counterparty service (CCP) which assumes counterparty risk for all the trades. SEs can be mutualized or demutualized.

Stock Exchanges are primarily order-driven markets. Stockbrokers, typically being the only entities authorized to trade on the Stock Exchange, do not generally serve as market makers since they usually do not have the strong capital base needed for that.

The actual market share of SEs in the government securities' turnover is difficult to quantify. Volumes reported as traded on SEs often include either transactions actually concluded in the OTC market and only reported to the SE and/or transactions apparently traded on a SE but actually brokered

¹⁹ “Developing ASEAN5 Bond Markets: What still needs to be done?” the IMF working paper, 2011

on the OTC market.²⁰ In addition, the volume of bonds traded on SEs on a repo basis cannot always be separated from the volume of bonds traded on an outright basis.

Yet, it is a fact that GS markets have mostly developed aside from SEs.²¹ It is therefore a fair assumption that the volume of fixed income cash instruments²² traded on SEs - GS in particular - is quite limited compared to either the OTC or the ETP markets.

Nonetheless, SEs play a significant role in the secondary market of GS in some EMEs. This point is addressed in Part III.

1.2.4. Inter-dealer broker

An inter-dealer broker (IDB) is a broker enabling two dealers to conclude a trade. A broker is a market intermediary who is instrumental in facilitating a transaction between two other parties. This intermediary can be either transparent or blind. A transparent broker puts in contact two parties with matching interests who then trade directly with one another. A transparent broker cannot trade as principal. A blind broker stands in between the two parties each of whom trades with the broker acting as principal. In the latter case, the broker trades in his own name but he normally has to be matched. He cannot take any position as he would then have a conflict of interest.

Types of trading venues	
Bilateral Direct:	OTC market
Indirect:	Inter-dealer broker
Multilateral:	Electronic Trading Platform Stock Exchange

1.2.5. General trends

The difference between OTC, ETPs and Organized Exchanges is narrowing in mature markets. **On the infrastructure side**, many traders on the OTC market have access to screens with bid and offer prices and to electronic trading systems. The use of these electronic trading systems has helped to increase the level of pre- and post-trade transparency.

On the regulatory side, mature markets are putting Organized Exchanges and ETPs on a level playing field. The same trend applies to the OTC market where some post-trade reporting requirements are increasingly imposed. The objective is to enhance price formation and reinforce the control of market authorities in order to ensure fair trading practices. The MiFID II supports this trend by introducing the new concept of an Organized Trading Facility defined as any facility or system designed to bring together buying and selling interests or orders related to financial instruments (Appendix B2). The objective is to further level a playing field between the various venues offering trading services. Single dealer platforms are tentatively expected to fall within this definition.

²⁰ As an illustration, the annual Fixed Income Survey by the World Federation of Exchanges (WFE) reports Johannesburg Stock Exchange (JSE) to have the highest bond turnover ratio amongst the 36 WFE members who responded to the survey. In fact, GS are traded exclusively on the OTC market in South Africa. The same survey reports the turnover of GS on the Madrid SE (BME) to be higher than on London Stock Exchange. In fact, all Spanish GS are traded OTC. But, in Spain all trades, including OTC, are cleared through Iberclear, a BME-owned entity, which reports transactions cleared on Iberclear as transactions traded on BME;

²¹ As an illustration, most of the USD 950 billion traded daily on the US domestic bond market in 2010 took place between broker-dealers and financial institutions. The US bond market operates without a central Exchange with hundreds of financial intermediaries quoting prices in the OTC market (Source: Financial Markets Series, Bonds Market, 2011);

²² The status is different for fixed income derivative instruments (ex. bond futures) which fit well in a central order book (COB) as they are – by contrast with the cash market – instruments both standardized and limited in number;

1.3. Types of Trading Models

A trading model is a way that market prices are formed, matched, executed and settled. In the OTC market, prices are formed by bilateral agreement. By contrast, in multilateral trading facilities, market prices can be formed based on quotes, orders or a combination of the two. The main differences between quote-driven and order-driven models have been outlined in section 1.3. In practice, things can be more complex. This section reviews in more depth the features of quote-driven and order-driven models and their possible combinations in SEs and/or ETPs.

Types of trading models	
Order-driven <ul style="list-style-type: none"> • continuous auction; • periodic auction; • single auction 	Central order book (COB) <ul style="list-style-type: none"> • Any participant can quote prices. There are no market makers. • Call market
Quote-driven <ul style="list-style-type: none"> • global; • tiered 	Market making <ul style="list-style-type: none"> • Only market makers can quote prices. Other participants can only trade on the prices quoted by market makers (price takers). • Market makers' continuous quotes can be hit by all participants admitted to the trading venue (including other market makers). • Market makers streamline firm prices only to one another. Quotes for customers are only on a request for quote (RFQ) basis.²³
Hybrid <ul style="list-style-type: none"> • specialist market; • global market 	Combination of COB and market making <ul style="list-style-type: none"> • COB and one market maker. A single market maker competes with customers that can also quote prices themselves. • Combination of COB and market maker models. Market makers compete with one another and with customers that can both hit the firm two-way prices quoted continuously by market makers and quote firm orders themselves.

1.3.1. Order-driven model (central order book)

In an order-driven model, investors' orders are routed to a central order book (COB). The orders are executed against one another automatically by price and then time priority on the Organized Exchange.

There are three types of order-driven models:

- (i) **Continuous auction system:** investors' orders are inputted in the COB continuously.
- (ii) **Single auction models (call markets)²⁴:** limit orders are entered in the COB during a defined period and are accumulated. Then, at the session closing, a computer finds the price at which the maximum orders volume can be matched. The corresponding price becomes the opening price of the day²⁵ or a reference price to enhance price transparency.²⁶
- (iii) **Periodic auction system:** in some markets where there is an insufficient volume for a continuous auction, there are periodic call markets during the day.²⁷

Order-driven model

²³ RFQ is defined in sub-section 2.2.2. This model, fairly standard in ETPs, is also implemented in some SEs, e.g., the Shanghai Stock Exchange and the Tokyo Stock Exchange. (Source: Market Making on Stock Exchanges, KKSE search and Planning Department, Oct. 2004; www.hkex.com.hk);

²⁴ Alternatively referred to as "fixing";

²⁵ Hong Kong;

²⁶ Poland, Italy, Brazil;

²⁷ Taiwan;

Advantages	Drawbacks
<ul style="list-style-type: none"> • Transparent; • Fair (level playing field; particularly relevant for retail investors) 	<ul style="list-style-type: none"> • Requires continuous flow of orders to be efficient (this drawback is mitigated with the single or periodic auction system but there is no longer trading immediacy); • Not fit for large orders

1.3.2. Quote-driven model (market making)

Market makers quote two-way prices for a security. Customers, whether market intermediaries or final investors, can trade only by striking the prices quoted by market makers. Price formation is driven by market makers' quotes. The execution centre is the quoting dealer.

Quote-driven model

Advantages	Drawbacks
<ul style="list-style-type: none"> • Ensures continuing availability of trading prices; • Enhances market liquidity and price stability 	<ul style="list-style-type: none"> • Less transparent than order-driven system; • Not a level playing field; • Market making has a cost which is ultimately borne by investors; • Market making needs expertise and capital; • Market needs sophisticated trading models; • Spread widens in volatile markets

Comparison of market making vs. continuous auction (order-driven model)²⁸

Criterion	Market-making	Continuous auction
Execution	Intermediary	Exchange
Intermediary's role	Principal	Agent
Price and time priority	No	Yes
Transparency	Low	High
Immediacy of execution	High	Can be low
Investors' equal access to best price	Low	High

1.3.3. Hybrid trading model

A hybrid trading model combines two separate market price formation procedures on the same trading venue. A number of established SEs in Europe and America have had for many years some form of market making system in combination with their COB. These hybrid trading models were initially implemented in the equities market. However, a few SEs²⁹ have now extended them to the government bond market.

Hybrid models can take different forms.

- (i) **Specialist market:** a market specialist³⁰ is a dealer appointed in an order-driven market to maintain orderly trading conditions by standing on the other side of the market when the market is unbalanced. His intervention is not continuous. By contrast with market makers that typically compete against one another, a market specialist has a monopoly for securities in respect of which he is appointed. He also has the option of trading an order immediately or

²⁸ "Market-making on the Stock Exchange", HKSE, Research and Planning Department, 2004;

²⁹ Ex. Turkey, Korea;

³⁰ Ex. NYSE. Alternatively referred to as a liquidity provider or "jobber" (LSE);

entering it into the central order book.³¹ Usually, only a small percentage of orders (typically around 10%) is executed against a market specialist.

- (ii) **Global market:** the COB and market making models are combined. Investors can trade both amongst themselves and against market makers who quote continuously both to customers and to one another. In return, market makers are usually offered some privileges by a SE, like a discounted transaction fee (Belgrade SE; Ireland SE), the right to do naked shorting (NASDAQ) or the exclusive access to the call market auction surplus (Ireland SE).³²

Note: Another illustration of a hybrid system is the mix made by some IDBs of voice broking (bilateral trading system) and e-trading (multilateral trading system).

1.3.4. Conclusion

- (i) **A market making system is best adapted to wholesale markets in which institutional investors trade large sizes.** Investors who want to trade large orders prefer to trade bilaterally with a market maker who will carry the position.
- (ii) **A central order book system is best adapted to markets where the orders flow is sufficient for the continuous auction mechanism to work.** When the market is retail dominated or when the traded volume is not sufficient to sustain the capital intensive activity of market making, an order-driven mechanism is the natural choice.
- (iii) **Market making is not an exclusivity of the OTC market and ETPs.** A number of established SEs in Europe and America has had for many years some form of market making system in combination with their COB.

1.4. Types of Market Participants

An adopted trading model will determine types of participants in the market.

(i) Quote-driven model

Market maker: Market makers quote two-way prices for a security. Appointed market makers³³ are committed to quote a certain number of securities for certain minimum quantities and with some maximum spreads during some period of time.

Price taker: A price taker is a non-market making dealer authorized to access a market makers' trading system and to deal on quoted prices. A price taker cannot submit an order in between market makers' quotes. In ETPs, price takers are generally banks only. However, some ETPs accept institutional investors such as mutual funds, pension funds and insurance companies in their unified quote-driven model (e.g. Colombia, Chile).

(ii) Order-driven model

Dealer (or investor): any dealer (or investor) authorized to trade in the system can submit orders in the COB.

³¹ Some market specialists have been fined in the US for stepping ahead of customers' orders ("pennyning");

³² "Market-making on the Stock Exchange", HKSE, Research and Planning Department, 2004,

³³ Informal market makers are dealers trading in and out for their own account without obligation to do so and incidentally providing liquidity thereby;

PART 2: USE OF ELECTRONIC TRADING PLATFORMS IN GOVERNMENT SECURITIES MARKETS

This part analyses the links between ETP and PD systems. It reviews different types of ETPs from the standpoint of the trading models used specifically in the government securities markets.

2.1. Links between ETPs and PD Systems

With exception of a few markets which are so large and deep that they are naturally liquid, bond markets require market makers to be liquid. Virtually all the DMOs which have appointed PDs have them perform market making functions among other duties. In order for market making to be effective, the compliance of PDs with their obligations has to be monitored and the quality of their performance has to be appraised.

ETPs are the only way for a DMO to monitor efficiently the compliance by PDs with their market making commitment. This applies as a PDs’ market making commitment includes four components. Firm two-way prices have to be quoted (i) for a certain **number** of securities; (ii) continuously during a certain minimum period of **time**; (iii) for some minimum **quantities**; and (iv) at certain maximum **spreads**. As a result, checking compliance with this commitment requires calculating these four statistic values for every PD and relevant securities on a daily basis.

Compliance with market making commitment and quality of performance can be measured by calculating four ratios. The first ratio is calculated for every PD. The next three ratios are calculated for every security quoted by the relevant PD.

- (i) number of securities quoted in a compliant manner / number of securities to be quoted;
- (ii) compliant time quoted / minimum time required;
- (iii) maximum authorized spread/ compliant time weighted average spread;
- (iv) compliant time weighted average quantity/ minimum required quantity.

A PD complies with its market making obligations when each ratio is equal to or above 1.0. ETPs are a convenient tool to channel these ratios directly to DMOs or provide all the data for calculation of the ratios.

2.2. Different Types of ETPs

Different organizational structures of ETPs correspond to different types of trading models (see Section 1.3.).

ETP types			
Order-driven	Pure	COB	
	Hybrid	COB + Market makers	
Quote-Driven	Global	Market makers and other participants trade on the same platform	
	Tiered:	Two separate ETPs or One single ETP with two market segments	
	B2B		Market makers = PDs only Market makers = PDs + non-PD banks
	B2C		Market makers + price taker banks Banks + institutional investors

2.2.1. Recap: order-driven vs. quote-driven

Order-driven models and quote-driven models are alternatively referred to as central order book (COB) and market making models, respectively. In both cases, the computer ranks trading

orders by price levels and timing of inputs. In an order-driven market, firm orders can be submitted anonymously by any market participant to a central order book (COB). In a quote-driven market, firm orders can be displayed only by market makers who commit to quote continuously firm bid and offer prices for the traded financial instruments. The other participants (“price takers”) can only hit or lift market makers’ buy and sell orders.

A hybrid model with market makers nonetheless remains a central order book model as firm orders can still be submitted by any market participant. As an illustration, a hybrid model has been implemented in Turkey and Korea (Part 3).

2.2.2. Quote-driven ETP: global vs. tiered

In a global quote-driven ETP, all market participants (market makers and price takers) trade on the same platform. This trading model has been developed mainly by Bloomberg and Reuters.³⁴

In a tiered quote-driven system, the activity is segmented depending on the type of market participants involved: banks (“sell side”) and final investors (“buy side”) correspond to “business-to-business” and “business-to-customer” platforms. In practice, the two structures are connected to the extent that a dealer who has been hit or lifted on one platform may want to cover his position on the other platform.

Business-to-business (B2B)

The ETP is accessible only to financial intermediaries (banks or securities firms, usually referred to globally as “sell side”). Most B2Bs limit their membership to market makers only.³⁵ B2B platforms always post firm prices³⁶ and trading is typically anonymous. Counterparties’ identities are disclosed only after a deal has been closed.

Business to customer (B2C)

The ETP is accessible also to final investors or “buy side”. Three principal types of B2C are:

- (i) **Single dealer system:** One bank posts prices on a screen. The access to the screen can be open or selective (only for the bank’s customers). In the first case, prices are always indicative. In the second case, prices can be firm for the indicated quantities.
- (ii) **Multi-dealer system:** Several banks post prices on the same screen. The posted prices are typically indicative.
- (iii) **RFQ (“request for quote”):** RFQ are a specific type of multi-dealer B2C. They allow a customer to call several³⁷ dealers simultaneously and to request a firm price for a specific transaction. A requested firm price can be a one way or a two-way price. The amount of the

³⁴ Bloomberg offers the possibility to market makers to post prices on a multi-dealer page and to select who can see their quotes and who can trade on them. Market makers can input their credit lines in the system. This allows an ETP to be put in place that mixes market makers and customers. However, a limitation of the Bloomberg system is that a market maker can input only one level of firm price, i.e. the price cannot differentiate depending on counterparty. Reuters dealing is reported to have a more elaborate procedure in the FX market (“The implications of electronic trading in financial markets”, BIS, January 2001). Each user sees both (i) the best bid and offer available in the market and (ii) the best bid and offer available specifically to him. The difference between the two prices arises from the credit allocation procedure followed by each user;

³⁵ Some B2B platforms can be accessed also by financial intermediaries in the capacity of price takers;

³⁶ Prices executable with a click and trade or through an automatic pairing of matching proposals;

³⁷ Up to 20 dealers in the Bloomberg system; the selection and the number of dealers called is decided by the customer;

proposed transaction and the identity of the customer are disclosed to the quoting dealers.³⁸ By contrast, the quoting dealers do not know what other dealers are being requested to quote.

In practice, dealers usually tend to quote tighter spreads or more attractive one-way prices on RFQ than on B2B. Dealers want to cultivate their business relationship with their customers. When a two-way price is requested, dealers are sometimes willing to pay a premium in order to “see the deal”.³⁹ The drawback of a RFQ for dealers is that competition is aware that a deal has been made and that the winning dealer will be seeking cover in the market. As a result, large deals tend to be negotiated on the OTC market to preserve confidentiality.

B2B-B2C: one single or two ETPs

A B2B-B2C model can be put in place using either two separate ETPs or one single ETP infrastructure with two market segments. So far, the standard procedure in Europe has been to trade B2B and B2C on separate platforms.⁴⁰ The Moroccan Treasury introduced an innovation⁴¹ this year by using one single ETP⁴² split in two market segments. The latter solution is more convenient and cost-efficient for all users of the ETP.

Conclusion

At the moment, the ETP market seems to be fundamentally a two-tiered market structure for the following reasons:

- (i) **Banks and DMOs have considered that splitting the participants in an ETP in two groups represents an efficient compromise between liquidity and transparency.** See subsection 1.1.3. for discussion of adverse effects of excessive transparency.
- (ii) **Market makers are willing to make markets to one another** when the sole objective pursued is to provide liquidity. It is then in their reciprocal interest to build a safety net ensuring that they can cover their positions any time and determine what the correct wholesale market price is for a given security. For any given quantity, the wholesale price is the same for any dealer. Technically incorrect prices are arbitrated away with the auto-matching.
- (iii) **By contrast, the prices quoted by a dealer to customers can vary.** Prices are a function of a relationship between a dealer and a customer, transaction size and potential informational value of a trade with regards to market trends. As mentioned above, dealers often quote better prices to their customers than they do to one another.⁴³ Yet, most dealers deem a global platform allowing customers to deal at wholesale prices to be detrimental as it erodes their profit margins.
- (iv) **Market makers want to be able to identify their counterparts to protect against credit risk.** In a RFQ procedure, both parties have identified themselves from the start. In a B2B platform, trading is anonymous until the deal is concluded. However, the counterpart can be identified at least as a member of a group (the market makers who have been allowed to trade on the platform). This safeguard would no longer apply in an open platform where a larger group of market participants can trade.⁴⁴

³⁸ Dealers want to know to whom they are quoting and submit to the ETP a list of customers they want to be called by. The quotes may depend on the quality of their business relationship with a particular customer;

³⁹ This applies when dealers believe that the trade might be indicative of a market trend;

⁴⁰ E.g., for B2B: MTS, ICAP-BrokerTec, BGC e-Speed; for B2C: Trade Web or Bond Vision;

⁴¹ To the best of the authors' knowledge;

⁴² Bloomberg;

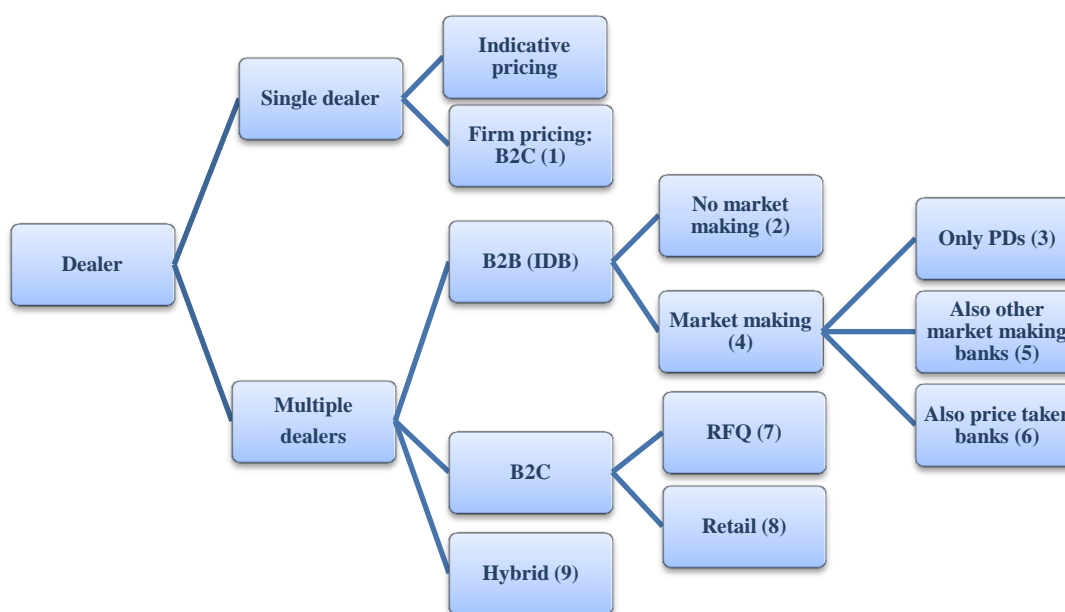
⁴³ Customers tend to like B2C platforms, as they provide “trading immediacy”, i.e., immediate execution. By contrast, completing a transaction in an order book can take time;

⁴⁴ Actually, credit risk can technically be managed also in the context of an anonymous trading. A CCP can be used to clear the transaction. This procedure is used in many Stock Exchanges. Alternatively, each participant on

As a result, market makers have so far strongly opposed opening B2B platforms to customers. In London, hedge funds have unsuccessfully sought access to Euro-MTS⁴⁵ since 2008. Market makers claim that continuous quoting of firm two-way prices requires either reciprocity or a client relationship. Some market makers add that even reciprocity may not satisfy PDs as PDs have special commitments to DMOs that other market makers do not have.

2.2.3. Diagram of ETP structures

The diagram below includes single dealer platforms which are actually electronic trading systems.



Notes:

- (1) Deutsche Bank Autobahn; Barclays Bank BARX;
- (2) E.g., UK IDBs for GEMMs (Gilt Edged Market Makers, viz. PDs);
- (3) E.g., MTS Slovenia;
- (4) With or without automatic cross matching;
- (5) E.g., most MTS domestic platforms; no non-banks market makers (ex. hedge funds have been refused access as market makers in EuroMTS);
- (6) E.g., many MTS domestic platforms; no access to end investors;
- (7) E.g., TradeWeb, Bond Vision: no market making;
- (8) Special case; E.g., Treasury Direct. These ETPs have predominantly a primary market function. However, they are also used to allow retail investors to sell securities back to the issuer;
- (9) E.g., Bloomberg: Ebond allows dealers to post firm prices on a click and trade basis (no cross matching) to some selected counterparts with whom they have credit lines to trade.

2.3. Market Share of ETPs

The size of the market share of ETPs expressed as a percentage of total turnover in the GS market is difficult to assess. There are few, if any, published data on this point. Anecdotic evidence suggests it varies widely.

an e-platform can identify those subscribers with whom it is willing to trade and the credit limit that it is willing to allocate to each trading party;

⁴⁵ EuroMTS is a pan-European ETP where all major benchmarks issued by governments in the EMU are quoted (along with other financial instruments);

Country ⁴⁶	OTC (%)	ETP market share (%)
Belgium	Dealers 35 Customers : 65	Dealers : 65 Customers : 35
Brazil	99	< 1
Colombia	20	80
Hungary ⁴⁷	99.6	0.4 SE
India	20	80
Israel	8	92 (81 SE, 11 MTS)
Korea ⁴⁸	68	32
Malaysia	100	0
Mexico	66	34 (30 ETP, 4SE)
Poland	91	9
South Africa	100	0
Turkey	44	56

In practice, the trading volume on the secondary market and the size of ETPs' market share do not seem to be correlated. Presumably this holds because the pricing references created by ETPs do not necessarily need to be supported by large trading volumes to be credible and instrumental in enhancing market liquidity.

2.4. ETPs on Stock Exchanges

2.4.1. Reasons why GS markets have generally developed aside from SEs

The fact that GS markets have generally developed aside from SEs is generally explained by reference to the fact that the equity and fixed income markets rest on different foundations with regards to the formation of market prices (sub-section 1.1.2.). To recap, an equity market is characterized by prices generated by orders forwarded to a central order book (COB) wherein an algorithm ranks buy and sell orders according to predetermined priority rules. A bond market is characterized by prices generated by the quotations of market makers and the following orders. The bond market shies away from the extensive transparency of a SE's COB (sub-section 1.1.3.).

In fact, market making is not exclusive to the OTC market and ETPs. A number of established SEs in Europe and America have had for many years some form of market making system in combination with their COB (sub-section 1.3.3.).⁴⁹ The development of GS trading activity on SEs has required fundamental changes in SEs' traditional structure and procedures, such as putting in place a quote-driven market, appointing a specific category of members with special duties and privileges, adopting a different fee model, etc. In other words, the SEs are morphing into MTFs, similar to other MTFs providing electronic infrastructure to trade GS on a multilateral basis, and are competing with them. Some SEs have been handicapped in adapting to a competitive environment by previously being monopolies.

Additionally, a limited role of SEs in the GS market is related to specificities of the GS market.

A majority of DMOs have appointed PDs. A foundation of the PD system is the belief that the liquidity of the GS market is best served by a specific group of dedicated market makers who are assigned certain duties and who are in return granted certain privileges to support their motivation to

⁴⁶ Sources: Belgian DMO (2012), the World Bank Peer Group discussion (November 2009), the World Bank GEMLOC meeting (June 2012), Tel Aviv SE web-site, ASEAN+3 Bond Market Guide (Feb 2012);

⁴⁷ MTS Hungary: started operation on January 2, 2012;

⁴⁸ As of June 2011, the market share of Korea Stock Exchange is 22.5% of the total bond market, 32% of the T-bond market (KTB) and 50% of the benchmark KTB market;

⁴⁹ E.g., NASDAQ and LSE; In some market segments, investors can deal only through market makers that compete with one another;

perform. A number of DMOs, particularly in mature markets where focus on liquidity enhancement is often strongest, offer to their PDs some privileges and/or rewards linked specifically to the PDs’ performance in the secondary market.⁵⁰ Some of these privileges⁵¹ cannot be offered by a SE but only by a DMO.

Two conclusions can be drawn. First, a SE should be considered by DMOs as a trading system supplier like any MTF. The objective is to ensure a level playing field amongst the suppliers of electronic trading models. A SE should be subject to the same selection criteria as any MTF.⁵² **Second, if a SE is appointed by a DMO, an ancillary issue is to determine if only PDs or any other members can be market makers.** This issue, common to all ETPs, is addressed in section 2.6. Another issue is for SEs to decide whether to adopt a pure market making model (market makers and price takers) or a hybrid model combining market making and central order book.

2.4.2. Assessment of role of SEs in GS markets

SEs have both competitive advantages and drawbacks.

Advantages of SEs

SEs already have the infrastructure and the expertise⁵³ required to organize markets, in addition to a possible synergy with the equities business. SEs can also handle some support functions such as trade registration and trade settlement.

Drawbacks of SEs

SEs have the same drawbacks as any other internally developed structure (sub-section 2.6.1.). This refers in particular to efficiency and “local system” issues. The technical sophistication of trading models increases continuously. The organizations for which trading facilities are not the principal business are competing against a moving target. Their cost is also higher as it needs to be amortized over a smaller number of participants. In addition, international PDs prefer to use the same trading system across different markets (simpler to use, more cost effective, more arbitrage efficient).

Advantages	Drawbacks
<ul style="list-style-type: none"> • taking advantage of an existing structure • possible synergy with other lines of business (eg. equities, derivatives) 	<ul style="list-style-type: none"> • all the drawbacks of internally built systems (Sub-section 2.6.1.)

Prerequisites for success

Two prerequisites condition a successful involvement of a SE in the government bond market:

- (i) **SEs need to adapt their standard structure** to the specificities of the fixed income securities. This applies to the trading models (quote-driven or hybrid), membership rules, level of transaction fee, etc.
- (ii) **SEs need to collaborate with DMOs and PDs** in respect of design and management of the system. The system will not work if PDs do not approve of it. Only the DMO can provide PDs with the full range of incentives to motivate them to trade.

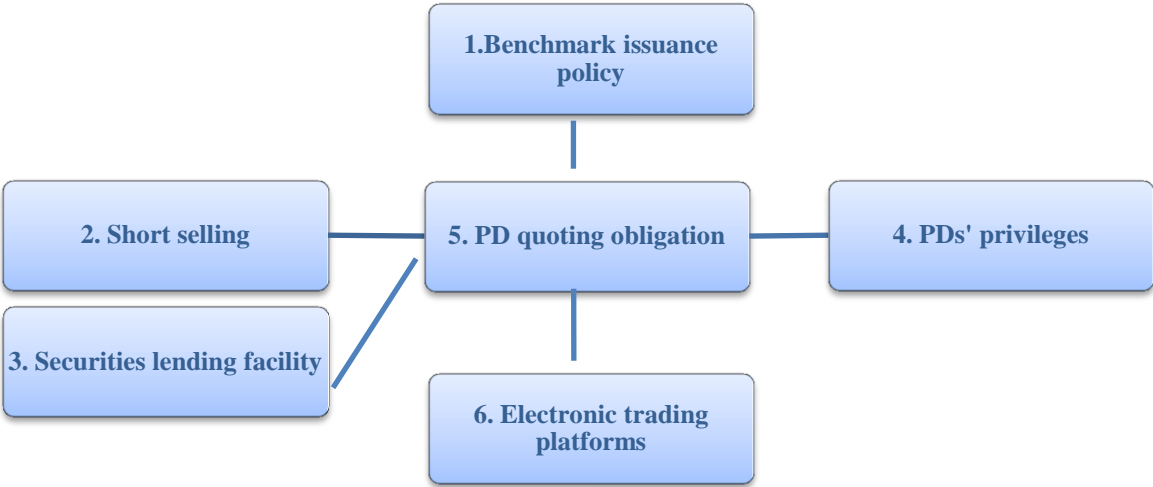
⁵⁰ See “PD systems, a draft background note” (March 2010), for a list of such privileges;
⁵¹ For example, allocation of special post-auction non-competitive bids linked to performance; status of DMO’s privileged counterparty for some debt management operations; exclusive access to securities lending facility to cover short positions;
⁵² Alternatively, a SE can acquire a MTF (which does not ease the selection criteria). Examples are LSE acquiring MTS or Warsaw SE acquiring MTS Poland;
⁵³ Including experience of overcoming regulatory hurdles;

2.5. A Roadmap for Launching an ETP

This section assumes that a DMO wants to be actively involved in putting an ETP in place with the objectives of enhancing liquidity of the secondary market and ensuring compliance by PDs with their market making commitment. The experience of markets which have successfully introduced ETPs suggests that two kinds of prerequisites (strategic and technical) have to be met at the outset.

2.5.1. Strategic prerequisites

Launching an ETP is the last step in a comprehensive government bond market development strategy, given that success of an ETP largely rests on the compliance by PDs with their quoting obligation. Four prerequisites usually have to be met beforehand to that effect: benchmark issuance policy, authorization of short sales, availability of securities lending facility and the ability of a DMO to reward top performers. The underlying steps are graphically summarized below:



The PDs' quotation obligation is central. All the other steps, including establishment of an ETP, are directly linked to it. An ETP enhances the liquidity of the secondary GS market because it provides the most effective way for PDs to perform their price-quoting obligation.

- (i) **Benchmark issuance policy:** There is a limit to the number of lines⁵⁴ for which PDs can quote firm two-way prices. Each line outstanding also has to have a minimum outstanding volume to allow PDs to cover their positions in the market. The liquidity of the secondary market starts with the appropriate issuance policy on the primary market.
- (ii) **Regulatory status of short-selling:** PDs cannot be expected to keep on their books at any moment of time a portfolio of securities which includes all the bond lines for which they have to quote firm two way prices. As a result, sometimes PDs will inevitably sell securities which they do not hold at the moment of trade, i.e., PDs are bound to sell short. Short-selling enhances market liquidity. If PDs can quote firm selling prices only for those securities that they hold in their portfolio, then the beneficial impact of the PD quoting obligation on the liquidity of the secondary market would be severely curtailed. Such restraint makes it difficult for a DMO to check whether PDs comply or not with their quoting obligation. In turbulent market conditions, short-selling can increase an already excessive volatility by triggering a downward spiral in prices. Some jurisdictions have therefore forbidden short-selling or strictly regulate it. It is thus important to assess the impact of short-selling in the relevant country.
- (iii) **Securities lending facility for PDs:** PDs which have sold GS short have to cover their position in the market in order to avoid a delivery fail in the clearing system. PDs are legitimately concerned by their potential inability to find a counterpart willing to sell or lend

⁵⁴ I.e., bond series or ISIN codes;

needed securities, in particular, when the GS market is not liquid. It is therefore a frequent practice in GS markets, mature markets included, for the DMO to act as securities lenders of last resort. The DMO achieves this by offering PDs an option to borrow (at a fee) from the DMO on a short-term basis the securities which PDs need to secure to avoid delivery fails.

PDs are usually reluctant to commit to make markets in the absence of such a safety net.

- (iv) **Additional privileges for the PDs:** Quoting firm two-way prices makes PDs incur both costs and risks. PDs have to put in place the required infrastructure. They are exposed to the risk of making trading losses. In return, PDs have also opportunities for making trading profits. Still, they need to be compensated by the DMO for the effort and the risks in order to be motivated to perform. This applies particularly at the early stages of development of a GS market. At the time, trading profit opportunities are limited as turnover is low. Thus, an agreement between PDs and a DMO may have to be revised in order to enable the DMO to reward PDs which are performing well.
- (v) **Agreeing with PDs on a price quoting obligation:** Once the above prerequisites have been met, a procedure can be agreed with PDs for quoting firm two-way prices for a certain number of GS. This may be yet another required adjustment to the PD-DMO agreement.

2.5.2. Technical prerequisites

Three technical prerequisites apply:

- (i) **PDs need to be closely involved in, and supportive of, the project.** Market liquidity is dependent on market sentiment. A market is liquid when a sufficient number of market participants believe it to be so and conversely. Authoritarian decisions imposed without support of market participants do not work with respect to market liquidity.
- (ii) **The governing rules of ETP should be designed by, or at least approved, by the DMO.** In particular, designing rules with respect to access, trading and fees enables the DMO to create a regulatory framework that facilitates quoting obligations of PDs.
- (iii) **An ETP should have capacity to provide statistical data for DMO to check and appraise PDs' quoting performance.** The underlying IT programming investment is not insignificant (to produce a daily report for every PD and for every security quoted showing time quoted, time weighted average quantity, time weighted average spread, and the volume of trades where others' prices were taken and those where the PD's prices were taken by others).

2.6. Strategic Decisions

2.6.1. ETP: lease or build

The ETP(s) used by PDs to comply with their price quoting obligation can be leased from a professional ETP supplier or be internally built. The latter option is generally selected by SEs and central banks. From the standpoint of a DMO, the advantages of an internally built ETP are not readily apparent. It is a time-consuming and expensive project. There seems to be no significant added value in trying to tailor an ETP to the specific needs of a given market as the basic structure of ETPs is fairly similar from a technical standpoint, same as for auction systems. By contrast, opportunities for making technical improvements at the periphery of the system (CCP, straight-through processing, co-mingled pages, etc.) often occur. The technical sophistication of trading models increases continuously. The organizations for which building trading facilities is not the principal business are competing against a moving target. Their system cost is also higher as it needs to be amortized over a smaller number of participants. Finally, as the GS market develops, the PDs group includes an increasing number of international banks trading on several markets simultaneously. These banks reluctantly use internally developed ETPs which can be used only in one single market. Their usage is administratively complex (they are not a standard system) and expensive (there is no synergy with other already existing

models). They do not facilitate price arbitrages across markets. For international banks, the higher the number of markets an ETP is used in, the better is the ETP.⁵⁵

2.6.2. One or several ETPs

The selection of one single ETP for PDs to comply with their market making obligations offers five advantages: (i) **price integrity:** the price is perfectly arbitrated as the quotes made by all market makers are subject to the same cross-matching system; (ii) **price transparency:** provides the market with easily accessible one-source price reference (eg. for investors’ portfolio revaluation); (iii) **market depth:** as all PDs quote on the same ETP, the potential number of counterparts is maximized. The number of counterparties (i.e., the market depth) would decrease if PDs quoted on different platforms unless all PDs quoted on all platforms. The latter alternative is more expensive and would expose PDs to higher risks; (iv) **monitoring of compliance with quoting obligations:** it is easier for DMOs to monitor compliance on one single platform than on several; (v) **it is the least expensive alternative for PDs in terms of connectivity costs** (IT and communication).

The selection of one single platform has one major drawback: the absence of competition provides no incentive for innovation or cost reduction.⁵⁶

The advantages and drawbacks of selecting multiple ETPs are the mirror image of the above.

Single ETP

Advantages	Drawbacks
<ul style="list-style-type: none"> • Price integrity • Price transparency • Market depth • Easy monitoring by DMO • Cheapest option for PDs 	<ul style="list-style-type: none"> • Cost control difficult • Less incentive for innovation • Business continuity risk

Multi Platforms System

Advantages	Drawbacks
<ul style="list-style-type: none"> • Free choice of business model by PDs • Competitive pressure limiting cost • Incentive for innovation 	<ul style="list-style-type: none"> • Impact on market depth and price transparency • Monitoring by DMO more complex • Higher cost of connectivity for PDs • Lower profitability for ETPs

The most efficient strategy seems to begin with a monopolistic system: a DMO will grant a single ETP a status of “recognized” or “designated” ETP and will monitor PDs on this platform. Competitive pressure can be preserved by making the recognized ETP status to be a temporary monopoly, i.e., valid for a limited period (e.g., 2 years), the renewal of the status being subject to performance. The PDs’ freedom of trading where they please can also be preserved – at least to some extent – by requiring that PDs post prices on the recognized ETP in order to comply with their market making commitment, but having traded volumes carry the same weight in the performance appraisal irrespective of the actual trading venue.

⁵⁵ Quote from Israeli DMO (<http://ozar.mof.gov.il>): “As with the Bloomberg system (used for auctions), the use of a well-known international company (MTS) whose trading system is already installed at major financial institutions worldwide will lower costs, facilitate activity by overseas participants and allow increased international exposure for the Israeli government securities market. Issuance and trading via international e-systems deepens the integration of the domestic bond market and of the capital market in general with the international markets”;

⁵⁶ To limit the impact of this drawback, single ETPs are generally appointed for a limited period of time (usually two years);

The strategy put in place in several European GS markets to minimize the drawbacks of the multiple platforms system has been: (i) to limit the number of designated ETPs to a maximum of three⁵⁷; (ii) for every PD, to check compliance with its quoting obligation on one single platform (chosen by PDs at their discretion among eligible ETPs); (iii) to encourage PDs (who have to make a market in at least one ETP) to be at least price takers in the other designated ETPs. This enhances price arbitrages, which encourages price unification across ETPs; (iv) to require ETPs to provide activity statistics needed by DMOs; (v) to encourage PDs to set up a composite page of best bid and offer processes from different ETPs.⁵⁸

2.6.3. Access to ETP: restricted or open

PDs generally represent de-facto exclusive membership of the market-making group in B2B e-platforms. Non-PD market makers are few and almost always aspiring PDs making markets on the ETP either to meet a prerequisite for their application⁵⁹ or to support their application by providing an evidence of their interest in the GS market concerned. The small number of non-PD market makers is quite reasonable. Why should a bank accept obligations in the secondary market identical to that of a PD without obtaining the privileges offered to the PDs as a legitimate compensation for the costs and risks incurred?

2.6.4. Quotation obligation: continuous or periodic

Should quoting be concentrated on specific periods of time (e.g., X hours in the morning and Y hours in the afternoon) or is it the best practice not to restrict periods of activity on the ETP(s)? In Europe, compulsory quoting is generally continuous for at least 5 hours a day. This is the result of competitive pressures in the European GS markets. In some other countries, putting in place a call market during specific periods of time would suffice to reach the objectives (market liquidity, price transparency). In Slovenia, PDs are rewarded for quoting early in the morning as they are opening the market.

2.6.5. Selection of designated ETP

A selection procedure is discussed in detail in the Appendix 1.

In Europe, ETPs are typically selected by vote of PDs. PDs are often familiar with potential candidates.. In such cases, the selection of an ETP does not need a formal procurement process.

2.6.6. Appraisal of PDs' performance on ETP

Should the appraisal criteria (i) be based on actual trades or PDs' willingness to quote bid/ask spreads and (ii) be focused on on-the-run bonds only or include off-the-run bonds as well? The appraisal of a PDs' performance is typically split in two parts: (1) quantitative (actual traded volumes) and (2) qualitative (quoting efforts, irrespective of the actual amounts traded). The qualitative appraisal is done in two stages:

- (i) have PDs complied with the minimum quoting requirements with respect to number of securities quoted, period of quotation, minimum quantities, maximum spreads? If not, the qualitative appraisal stops there.
- (ii) for those PDs which have met the minimum quoting requirements, to what extent have they done better in terms of any of the four aforementioned variables?

⁵⁷ Four in the Netherlands;

⁵⁸ Some software companies (e.g., ION) provide composite pages;

⁵⁹ E.g., in Slovenia, a bank has to have been a market maker on MTS Slovenia for at least 6 months before applying to be appointed as a PD;

Volumes or spreads

Both volume and spread criteria are relevant. They correspond to a quantitative and qualitative appraisal, respectively. Volume is generally an inverse function of spreads. Nonetheless, a quantitative appraisal allows evaluating PDs irrespective of whether they have complied fully with their quoting obligation. It also evaluates PDs' activity in securities for which there are no quoting obligations. Since volume is also dependant on customer relationships (advantage of large banks) and can be manipulated ("ping pong trading"), it is important to run the qualitative appraisal as well to isolate PDs' quoting efforts from other factors. Thus, although DMO practices vary, they typically consider both volumes and spreads (usually on a 50/50 basis).

Off-the-run securities trading

Typically, off-the-run securities are included in PDs' appraisal (traded volume and quality of quotation). In doing so, the objective is to check compliance (quoting may be required for off-the-runs as well) and/or initiative (if such quoting was not compulsory).

2.7. Conclusion

General

There is no standard most efficient type of market configuration. Which trading venue sees the bulk of trading in a particular asset class depends on the degree of standardization of the underlying instrument, on the size and sophistication of market participants and on a host of other institutional, regulatory and historical factors.⁶⁰ As a result, it is difficult to draw firm conclusions on the most efficient type of venue configuration for government securities. Yet, some general observations can be made.

The liquidity of the secondary market of government securities usually requires putting a market making system in place. The importance of PDs is central, no matter what trading venues the market offers (whether there is an ETP or not).

Some features seem to be common to all successful market architectures, including ETPs: (i) commonality of interests of all parties involved; (ii) trading venues which fit the instruments traded; (iii) preservation of a competitive environment; (iv) right balance between duties and privileges of each party, PDs in particular; and (v) a flexible approach adapting policy to changing market conditions.

Specifically for ETPs

ETPs efficiently contribute to price transparency and market liquidity. Managing an ETP is as much an art as a science.

No single model is applicable to all countries: The proportion of trading volume on ETPs differs significantly from country to country (e.g., 20-30% on average in the EU, 80% in India). The degree of market development does not necessarily correspond to a more intensive use of ETPs. Large trades tend to be negotiated out of ETPs.

The European experience indicates that success of ETPs largely depends on the support by PDs. PDs should be involved in the design of the system and coordinate with the management.

⁶⁰ "A Primer on bond markets in Asia: Ten years after the crisis", OECD Working Party on Public Debt Management, Hans Blommestein and S. Ghon Ree, 2009;

The number of ETPs is best kept limited in order not to fragment the market. It is possible to limit the number of ETPs in a fair and objective way.

In mature markets, PDs tend to be appraised more on the quality of the quoted prices than on the amount of traded volumes.

Flexibility is important. A practical illustration is the maximum spread to be quoted by market makers on ETP. The spread should not be too wide (this would not contribute to market liquidity) and it should not be too tight (this would create an artificial liquidity). Market makers should be able to switch timely from a fixed maximum spread to the best-effort price quotations in turbulent market conditions. If not, the market making system breaks down.

PART 3: COUNTRY CASES

Country case studies have been broken down in two groups: the Eurozone and the other countries. The Eurozone is used as a reference in assessing the prevailing practices in mature markets with respect to ETPs. It has been chosen for two reasons. First, development of the government securities market in the Eurozone has been accelerated by integration of local financial markets, harmonization of debt management practices, widespread introduction of new trading technologies and a strategy of cooperation among national Treasuries which have adapted their debt management policies to compete with other national borrowers. Second, the most widely adopted trading models (quote-driven systems segmented into B2C and B2B platforms) and their implementation processes (limiting the number of “designated ETPs”) are fairly similar across the region.

The other countries have been selected to show the diversity of the ways in which ETPs can be organized. A section of the report pertaining to these other countries is divided in two parts. **The first part** (selected country practices) includes a comparative analysis of ETP market share, linkage to PD system, institutional arrangement, business rules and role of Exchanges in a sample of seven countries.⁶¹ The analysis shows a diversity of country-specific features, particularly with respect to trading models. **A second part** (additional country analysis) includes an individual analysis of additional data in nine particular countries.⁶²

3.1. Eurozone Countries

In the EU, the market making by PDs of GS on electronic trading platforms was pioneered by Italy with the establishment of MTS Italy in 1988. The Italian Tesoro has been the first DMO to provide in its PD Agreement the obligation of PDs to quote firm two way prices to one another on an IDB platform for certain securities (at minimum quantities and at maximum spreads) continuously during a certain period of time (currently a minimum of 5 hours a day). MTS is the software designed by the Tesoro to implement this market making commitment and check compliance by the PDs. Starting in 1999, the MTS model gradually spread to 13 EU countries.⁶³ By 2002, almost all DMOs in the EMU⁶⁴ adopted a compulsory market making policy. Only a small number of DMOs (Austria, France, and Germany) followed a passive policy, i.e., these DMOs did not get involved (at least formally) in the activity of their PDs (or quasi-PDs for Germany) on ETPs.

The standard procedure implemented by all DMOs which have adopted an active policy has been to agree with their PDs that compliance with their market making commitment will be checked only on some ETP(s) specifically “designated” by the DMO to that effect. PDs remain free to post prices and trade wherever they please. The volumes traded by PDs on the secondary market count with an equal weight in the appraisal of their activity irrespective of the trading venue. The compulsory use of the designated ETP applies only to checking the PDs’ compliance with their quoting obligation. Nonetheless, this procedure commits PDs to post prices on a specific ETP(s).

Two DMOs (Greece and Spain) authorized their PDs from the start to comply with their quoting obligation on two “designated” ETPs (MTS + HDAT in Greece and MTS + SENAF in Spain). All other European DMOs initially designated one single ETP (“in casu”, MTS). They justified their “single platform policy” on the grounds that concentrating the PDs’ price quoting obligation on one single ETP yields three benefits: it enhances price transparency, increases market depth and simplifies the monitoring by DMOs of their PDs’ market making activity.

⁶¹ Columbia, Hungary, Korea, Malaysia, Mexico, Poland and Turkey;

⁶² Denmark, Israel, Korea, Morocco, Pakistan, Philippines, Poland, Singapore, Turkey;

⁶³ Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Spain, Poland, Portugal, the Netherlands + the pan-European EuroMTS based in London. Today, MTS is also established in Israel and Hungary;

⁶⁴ With the exception of Germany (no PDs);

Starting in 2007, most European DMOs⁶⁵ gradually allowed their PDs to comply with their quoting obligation on more than one single ETP. The principal objective was to create a competition between ETPs in order to ensure that the cost of trading was kept as low as possible. Yet, the DMOs concerned have endeavoured to limit the number of ETPs used by their PDs with a view to preserving price transparency and market depth.

The procedure used by European DMOs to limit in a fair and objective manner the number of ETPs actively used by PDs has been basically the same. It is a four-step process:

- (i) A DMO defines the requirements which an ETP has to fulfil in order to acquire the status of eligible platform which PDs can use to comply with their quoting obligations. The eligibility requirements, defined by a DMO after consulting with its PDs, are mainly: to offer access to all PDs, to follow the guidelines on trading organization as set by a joint committee of PDs and DMO; to make public current bid and offer prices and depth of trading interest, on a continuous basis and on reasonable commercial terms; and to provide the DMO with all the statistics required to monitor the activity of its PDs.
- (ii) A DMO requests potentially interested ETPs to apply for the status of eligible platform.
- (iii) A DMO requests PDs to indicate the number of ETPs which they want to appoint. Trading on several ETPs can be expensive for some PDs because of the cost of connectivity.⁶⁶ The PDs' responses ranged from one ETP (Denmark) up to a maximum of three (Belgium) or four (the Netherlands).
- (iv) A DMO requests PDs to rank applicants and appoints the ETPs with the largest number of votes, up to a maximum number of ETPs that was recommended by the majority of PDs.

The abovementioned procedure allows PDs to play an important role in the ETP selection process. In practice, PDs were also consulted about (i) the eligibility requirements for an ETP, (ii) inclusion of particular ETPs in eligibility list, (iii) whether it is worth publishing a formal request for proposal⁶⁷ and (iv) whether the DMO should organize a meeting prior to voting in order to give ETPs an opportunity to present their services to the PDs. PDs were also requested to vote on the appropriate number of ETPs when more than one ETP were to be designated. The rationale for involving PDs so closely in the ETP designation and organization process rests on the DMOs' conviction that electronic trading works efficiently only when it is actively supported by a large majority of PDs.

Most European DMOs have played an active role in increasing use of ETPs on the GS secondary market. In the process, they have managed to limit the fragmentation of the market without instituting a monopoly on the ETP market.⁶⁸ Out of the thirteen ETPs currently active in the GS markets in the EMU, six are used by PDs to comply with their market making obligations, out of which four are international models⁶⁹ and two are local models.⁷⁰ These six platforms are all IDB⁷¹ platforms. Out of

⁶⁵ In fact, all DMOs except Austria, France and Germany (hands-off policy) and except Denmark, where PDs requested the DMO to keep its single platform policy in order to avoid fragmenting an already small market;

⁶⁶ Connectivity refers to the cost of linking a PD's front office to the ETP (dedicated phone line) and linking the ETP to computerized database management systems in the PD's back office;

⁶⁷ The response was negative as PDs were all already familiar with the functionalities of the ETPs concerned;

⁶⁸ In 2007, the DMOs in the EMU reviewed with the European Primary Dealers Association (EPDA) the feasibility of avoiding fragmentation altogether by establishing a Central Booking Platform ("co-mingled page" or "composite best page" on a news service) which would centralize on one single screen all the information (best prices and market depth) spread across different ETPs. This project was suspended due to high cost. Although this initiative did not succeed, a fragmentation was limited due to the following factors. First, in practice the bulk of the trading activity remained with one or at most two ETPs. Liquidity attracts liquidity. Second, the obligation of PDs to continuously quote firm prices ensures that market prices are always perfectly arbitrated. Finally, software was written allowing to centralize on one single screen prices posted on different ETPs. Many traders report use prices without knowing from what particular ETP they come from;

⁶⁹ MTS, ICAP-BrokerTEC, BGC-Cantor, Eurex Bonds;

⁷⁰ SENAF in Spain and HDAT in Greece;

⁷¹ IDB;

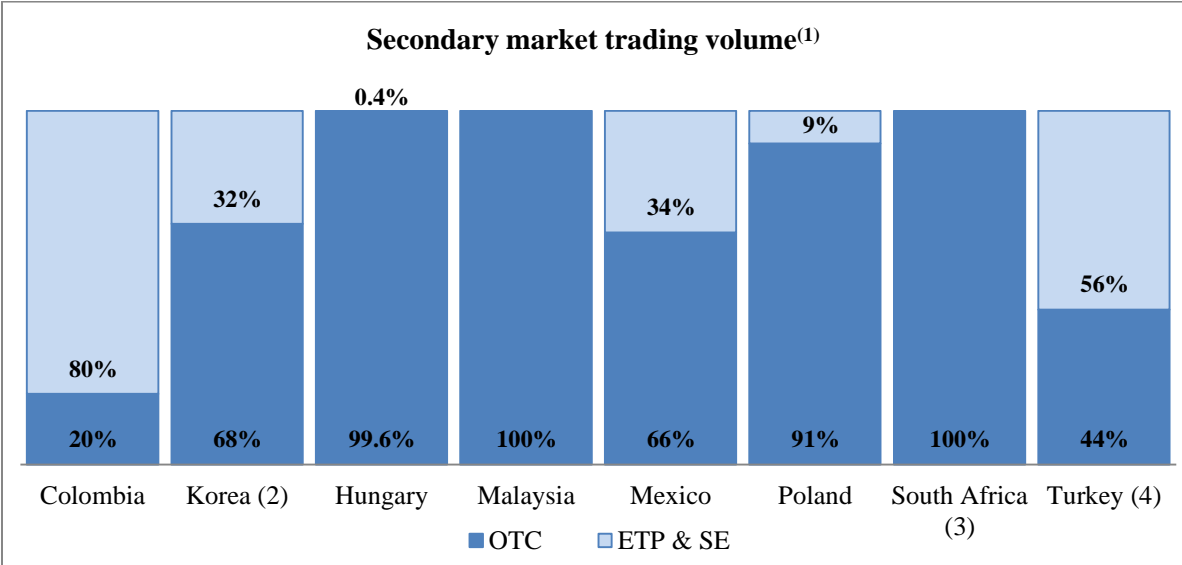
the remaining seven platforms, four are IDB⁷², one is accessible by both dealers and customers⁷³ and two are specifically customer-related and they work on a RFQ basis.⁷⁴

3.2. Other Countries: Comparative Analysis

This part summarizes the policies to promote price discovery and transparency of selected EMEs: Colombia, Hungary, Korea, Malaysia, Mexico, Poland, South Africa and Turkey. Criteria for the selection include relatively large market sizes, similar degree of development and market liquidity, as well as the existence of a long standing primary dealer arrangement. The overview focuses on the role ETPs have in the secondary market architecture of select countries, and on ETPs’ relationship to the primary dealer programs. The case of Korea has been added given the prominent role of the ETP operated by the Stock Exchange.

3.2.1. Quantitative information on ETPs

OTC trading dominates domestic government securities markets in Korea (68%), Hungary (99.6%), Malaysia (100%), Mexico (66%), Poland (91%), and South Africa (100), but plays smaller role in Turkey⁷⁵ (44%), and Colombia (20%). In Turkey, 54% of trading takes place in the ETP operated by the SE, while in Colombia’s case, 80% of trading is conducted on 2 ETPs (one Central Bank-operated and one SE-operated).



Source: Gemloc Investor-Country Conference 2012 - Country Information Survey

Notes:

- (i) % of total; the data as of 2011 or latest available
- (ii) In Korea, ETP is managed by SE
- (iii) Reported as SE
- (iv) ETP managed by SE

⁷² Liquidity Hub, Market Axess, Tradition, TulletPrebon;
⁷³ Bloomberg;
⁷⁴ TradeWeb and BondVision;
⁷⁵ As of end 2011, banks traded 47% OTC vs. 53% at Istanbul Stock Exchange (ISE), whereas brokerage houses trade 3% OTC versus 97% on ISE. PDs have to fulfil their commitments on ISE. Institutional investors such as mutual funds, pension funds and investments funds have obligations to direct their orders to ISE via a bank or a brokerage house. Other institutional investors prefer to trade OTC;

3.2.2. Linkages to PDs

Mandatory quoting obligations: Consistently, all select countries impose mandatory quoting obligations for their primary dealers that are required to provide firm quotes, except for Malaysia requiring both firm and indicative quotes.

Securities required to be quoted:

- **Colombia:** Only bonds, including linkers, but not bills. Selection of 7 out of 12 issues is proposed by the DMO, which PDs can change on a weekly basis;
- **Hungary:** GS (both bonds and bills) that have a remaining time to maturity more than 90 days on MTS Hungary;
- **Korea:** Two-way prices on a continuous basis for the on-the-run benchmarks on the KSE;
- **Malaysia:** All benchmark issues;
- **Mexico:** All on-the-run and off-the-run issues;
- **Poland:** Two-way prices for benchmark Treasury securities, defined by the Minister of Finance;
- **South Africa:** Two-way prices on all government securities of R10 billion and more, when asked, under all market conditions. PDs are required to quote fixed rate bonds. There are no PDs for other types of securities (zero coupon bonds, inflation linked bonds, floating rate notes);
- **Turkey:** Two-way prices continuously for 6 benchmark issues out of 9 specified by the Treasury for at least three-month period at the ISE Bonds and Bills Market. A PD should quote at least 4 fixed rate, 1 floating rate and 1 CPI- indexed security.

Minimum quotation size: Hungary, Korea, Mexico, Poland, and Turkey impose minimum quotation size requirements for their primary dealers:

- **Hungary:** HUF500 mn (USD2.2 mn) for benchmark line, and HUF300 mn (USD1.3 mn) for non-benchmarks;
- **Korea:** KRW1 bn (USD0.9 mn);
- **Mexico:** MXN20 mn (USD1.5 mn);
- **Poland:** PLN10 mn/5mn (USD2.9 mn/1.5 mn);
- **Turkey:** TRY5 mn (USD2.8 mn).

Minimum secondary market volume requirement: Some countries establish a minimum trading share on an on-going basis, while others set a minimum trading share over a pre-established period as a PD entry requirement.

- **Korea:** For every 6 months, 40% of total trading volume in all government securities should be on the KSE;
- **Mexico:** The minimum market share for market makers (including primary market) is 7%;
- **South Africa:** Minimum market share in the secondary market is 14.5%;
- **Poland:** There is no minimum secondary market volume requirement, though the quality of Treasury securities quotations weighs 40 % in the PDs selection criteria;
- **Turkey:** There is no minimum secondary market volume requirement for PDs. However, according to 2012 PDs' selection criteria, outright purchase and sale transactions of fixed income securities on the ISE and off-exchange should not be less than TRY4.6 bn (USD2.6 bn) for the year prior to application date.

Maximum spread limits: Poland, South Africa and Turkey impose maximum spread limits that are calibrated based on different criteria: maturities, types of issue, previous closing prices, benchmark or off-the-run status.

- **Colombia:** 5bps/10 bps, based on maturity;
- **Hungary:** 25 bps for benchmark line, and 40 bps for non-benchmarks;
- **Korea:** 400 ticks from previous closing prices;
- **Poland:** 20/30/45/60 bps, based on maturity;
- **Turkey:** Based on coupon type, 0.50TL for couponed bonds; 13 bps (0%-9.99% interval), 25 bps (10%-19.9% intervals), 50 bps (greater than 20%) for zero coupon securities;
- **South Africa:** 5bps/10 bps

Mandatory continuous quoting period: In all select countries, there are minimum quoting periods to fulfil market making obligations:

- **Colombia:** 70% of total trading time;
- **Hungary:** Trading hours are from 9.00 to 16.45 during which each PD has to quote minimum for 5 hours (87 % of trading hours). All PDs have to quote two-way prices for benchmark securities from 13.45 to 14.00, as this is the time when the Government Debt Management Agency fixes benchmark yields. For off-the-run securities there are at least 3 market makers designated for each issue that have to quote continuously;
- **Malaysia:** By 10 am on every business day;
- **Mexico:** 4 hours between 9:00 and 13:00 (100% of trading hours);
- **Poland:** 5 hours;
- **South Africa:** 100% of trading hours, between 8:00-17:00;
- **Turkey:** On every trading day of the ISE, between 9.45-12:00 and 13.15 -16:00 (ISE trading hours are 9:30-12:00 and 13:00 -17:00).

Additionally, in South Africa all GS are quoted on an indicative basis, while in Turkey firm quotes are provided for all issues even without mandatory obligations.

Resting time for PDs after quotes have been hit:

- **Malaysia:** No resting time;
- **Mexico:** No resting time;
- **Turkey:** 5 minutes.⁷⁶

Role of ETP trading in scoring system for PDs ranking:

- **Colombia:** Only ETP transactions are taken into account (weighting: 50% on the Central Bank ETP and 50% on the SE ETP). OTC does not count;
- **Mexico:** OTC trades are taken into account only in B2C trades, while in the case of B2B trades (between PDs) only ETP trades count for scoring;
- **Turkey:** No scoring system.

3.2.3. Institutional arrangements

Existence of an ETP for GS: In all select countries, except for South Africa and Mexico, there is one ETP for GS that can be operated by SE, the Central Bank or a private institution. Mexico is an outlier with 8 ETPs of which 5 are B2B and 3 are B2C.

- **Colombia:** SEN (Electronic Trading System) managed by the Central Bank with exclusive access to PDs; and MEC (Colombian Electronic Market) operated by SE and accessible to PDs, brokers and institutional investors;

⁷⁶ If quotation sizes descend below TRY5 mn as a result of a transaction or the quotations are called back for any reason, the PD will renew the quotations in 5 minutes;

- **Hungary:** MTS Hungary⁷⁷, operated by EuroMTS Ltd for B2B, and Budapest Stock Exchange, managed by Budapest Stock Exchange for B2B;
- **Korea:** KTS (Korea Treasury Bond Trading System) managed by the Korea Stock Exchange (KRX);
- **Malaysia:** Bursa ETP managed by Bursa Malaysia SE for B2B;
- **Mexico**⁷⁸: Five B2B platforms are operated by IDBs of which one is co-owned by SE and ICAP. Most trading volume takes place on three of these platforms. Three B2C platforms are also operated by IDBs;
- **Poland:** Treasury BondSpot (TBS) Poland managed by the SE (BondSpot S.A.) for B2B, B2C (inactive);
- **Turkey:** OTASS (Automated Bond Trading System) managed by the SE (ISE) for B2B.

Access to ETPs: In most select countries direct access is exclusive for PDs. In Mexico, Colombia and Poland non-PDs access a different platform; while in Turkey and Korea all trade on the same platform (open order book).

- **Colombia:** SEN (Electronic Trading System) is for market makers only; MEC (Colombian Electronic Market) is for all other participants, including institutional investors;
- **Hungary:** Only PDs;
- **Korea**⁷⁹: PDs (including candidates to PDs) and government bond dealers;
- **Malaysia:** All licensed banks and money brokers⁸⁰;
- **Mexico:** PDs have exclusive access to 5 ETPs, while other market participants access 3 other B2C ETPs;
- **Poland**⁸¹: PDs have exclusive access to one segment of the ETP, and it is possible to establish another segment accessible to non-PDs and institutional investors, but it is not operational;
- **Turkey**⁸²: PDs, banks brokerage houses and the Central Bank access the same ETP operated by the SE.

Open order book⁸³ or tiered⁸⁴ ETP:

- **Colombia:** Tiered – SEN operated by the Central Bank is for market makers, MEC operated by the SE is for the other participants;
- **Korea:** Hybrid trading system combining market making and central order book;
- **Malaysia:** Quotes provided by PDs are accessible to both PDs and Non-PDs (banks)⁸⁵;
- **Mexico:** Tiered – five ETPs for interbank trading including PD, and three other platforms for trading between PD and non-PD entities;
- **Poland:** Tiered – non-PDs are not entitled to enter quotes into the system but can place orders against quotes provided by market makers. Institutional investors are allowed to trade on the

⁷⁷ Started operation on January 2, 2012;

⁷⁸ ETPs are “semi-electronic”, which means that clients can see prices on the ETP’s screens and execute operations via telephone. Currently, the only completely-electronic ETP in the country is the MexDer ETP for the GS derivatives market;

⁷⁹ The participants need not be members of KSE. A status of “special participant” has been set, which allows to have access to government bond trading only;

⁸⁰ All licensed banks and money brokers are trading members of the ETP. Non-banks or institutional investors can become non-trading members of the ETP, i.e., not allowed to deal directly but can access information;

⁸¹ As of December 2011, 32 global and local financial institutions are participants of the TBS Poland market: 25 as market makers, 5 as price takers, and 2 as institutional investors;

⁸² Institutional and individual investors can participate via members;

⁸³ Any non-PD can hit the two-way quotes provided by PDs;

⁸⁴ PDs only provide firm two-way quotes for other PDs and then they can offer prices to non-PD entities;

⁸⁵ However, the quotes are normally indicative and although trading happens on an automated matched deal on the trading platform, the deal is always negotiated outside the platform;

repo market as well as on the cash market in a separate institutional segment (B2C), however this segment is inactive;

- **Turkey:** Open order book.

DMOs' involvement in selection of ETPs: Hungary and Mexico are the only countries where the DMOs have been formally involved in the selection of the ETPs.

- **Hungary:** The DMO has been formally involved in the ETP selection, and all the decisions made by MTS Hungary (except for the decisions pertinent to commercial, technological or regulatory matters) are subject to the prior agreement of a committee chaired by the DMO;
- **Malaysia:** The DMO has not been involved in the ETP selection. Bursa ETP was mandated by the government to operate the ETP as the centralized platform for trading and reporting all unlisted debt securities;
- **Mexico:** The DMO has been formally involved in the ETP selection. ETP managers consult with the DMO whether ETP's operation on the market is appropriate (however, the DMO is not the agency that authorizes its operation);
- **Poland:** The DMO has not been involved in the ETP selection. The ETP is an integral part of the PD system developed by the Ministry of Finance in cooperation with the National Bank of Poland, the National Depository for Securities and banks;
- **Turkey:** The DMO has not been involved in the selection of the ETP.

In all of the respondent countries, DMOs use trading systems to check compliance by PDs with their quoting and volume obligations.

Restrictions on any investor to trade on OTC markets: Except Turkey, there are no restrictions placed on any investor to trade on OTC markets. In Turkey, mutual funds, pension funds, and investment funds have the obligation to direct their orders to ISE via banks or brokerage houses. Other institutional investors trade OTC.

3.2.4. Business rules

Types of trades:

- **Colombia:** Spot, forward, and repo;
- **Malaysia:** Spot, forward, and repo;
- **Mexico:** Spot;
- **Poland:** Cash, repo (classic repos and reverse repos);
- **Turkey:** Spot, forward (maximum 90 days for GS and maximum 30 days for private sector securities) and repo.

Settlement cycles:

- **Colombia:** T+0;
- **Hungary:** T+2;
- **Korea:** T+1;
- **Malaysia:** T+1;
- **Mexico:** T+2;
- **Poland:** T+2;
- **South Africa:** T+0 for am trades; T+1 for pm (T-Bills), T+3 (T-Bonds);
- **Turkey:** T+0.

Reporting of OTC trades to central authority: Prices for all trades and volumes for block trades are reported to a central authority with different time lags:

- **Colombia:** 15 minutes after trade;
- **Korea:** 15 minutes after trade;
- **Malaysia:** 10 minutes after trade;
- **Mexico:** Within 2 hours after the market closes;
- **Turkey:** Within 7 business days.

In Hungary, trades are reported by issue to the DMO on a weekly basis. In South Africa, only volumes for block trades are reported at the close of business. All trades that are reported to the South African SE are booked on the SE system. OTC trades can only be reported when they are matched. Trades executed out of the SE by members of the SE have to be reported to the SE within 30 minutes.

Dissemination of trading information to the public:

- **Hungary:** Daily reporting of volumes and average prices for each bond and T-Bill line is done by the DMO;
- **Malaysia:** Price, yield, volume, ISIN by Bursa Bond Malaysia Bhd, and the Central Bank;
- **Mexico:** Number of operations, traded volume and yield to maturity by the Central Bank;
- **Poland:** Prices (first, maximum, minimum, last, average), volumes; fixings' prices and yields by ETP (BondSpot S.A.);
- **South Africa⁸⁶:** Yields by Bloomberg and Reuters;
- **Turkey:** Best bids and offers, market depth data, minimum/maximum prices, opening/closing prices, previous trade information, simple/compound yield, percentage change, nominal volume, trade value, number of trades are reported by licensed data distributors and sub-distributors.⁸⁷

Time lag for dissemination of trading information to the public:

- **Korea:** Real time;
- **Malaysia:** 10 minutes⁸⁸;
- **Mexico:** 2 days;
- **Poland:** Real time;
- **Turkey:** Real time⁸⁹.

Alternative price discovery methods: Mandatory presentation of two-way quotes for GS by market makers is the only method of price discovery in Mexico. Other markets have adopted alternative price discovery methods that are complementary to two-way quotes provided by market makers:

- **Hungary:** Mandatory price discovery procedure for PDs prior to exchange auctions to fix the price of source bonds;
- **Malaysia:** Bond Pricing Agency, BNM's YTM consolidation, "when-issued" trades;
- **Poland:** Price fixings (twice a day);
- **Turkey:** OTC voice trading or ISE multiple price continuous auction with a market making system that supplies quotations continuously.

Price vendors or providers:

- **Colombia:** INFOVAL, owned by the SE;

⁸⁶ Pre-trade: Banks place indicative yields on their homepages, on the Reuters screen and Bloomberg systems. Johannesburg SE has a consolidated screen with "best price" that it disseminates to its members;

⁸⁷ There are 24 distributors (Reuters, Bloomberg, etc.) which disseminate data to its customers;

⁸⁸ Published on the websites;

⁸⁹ Via data vendors;

- **Malaysia:** Bond Pricing Agency Malaysia (BPAM), privately owned and registered with the Securities Commission;
- **Mexico:** Proveedor Integral de Precios (PIP) and Valuación Operativa y Referencias de Mercado (VALMER) - both are private, the latter is owned by the exchange;
- **Poland:** ETP (Treasury BondSpot Poland), private and monitored by the Ministry of Finance;
- **Turkey:** Istanbul Stock Exchange (ISE), public.

Government bond or hybrid (government and non-government) indices:

- **Hungary:** MAX, RMAX, ZMAX, MAX Composite;
- **Malaysia:** Bloomberg-AIBIM-Bursa Malaysia Sovereign Shariah Index;
- **Poland:** TBSP® Index;
- **South Africa:** GOVI / ALBI;
- **Turkey:** EQ 180; EQ 180; EQ COMPOSITE; MV 180-; MV 180+; MV COMPOSITE.⁹⁰

Marking-to-market of GS: In all select countries marking-to-market of government securities is mandatory except for Poland.

Source of prices:

- **Colombia:** Price vendors that use market makers quotes as a source;
- **Hungary:** Primary dealers' price quotations;
- **Malaysia:** Bond Pricing Agency Malaysia (MPAM), and some banks' own internal guidelines for verification;
- **Mexico:** Price vendors and agencies specializing in valuation and accounting that use market makers quotes as a source;
- **South Africa:** Bond Exchange of South Africa;
- **Turkey:** Istanbul Stock Exchange (ISE) Bonds and Bills Market daily bulletins as the main sources.

3.2.5. Roles of Stock Exchanges

- **Colombia:** SE is the provider of electronic trading facility for non-PDs. It is also one of the three providers of repository services for OTC trades (the other two are the Central Bank and the CSD);
- **Korea:** SE is the provider of electronic trading;
- **Malaysia:** SE is the provider of electronic trading and repository, but in fact operates only as a repository.
- **Mexico:** SE operates one of eight trading platforms through a joint venture with an IDB (ICAP);
- **South Africa:** SE operates as repository;
- **Turkey:** SE is the only provider of electronic trading and the repository of OTC trades.

⁹⁰ Equally weighted indices: (EQ 180-: bills and bonds with less than 180 days to maturity as equally weighted; EQ 180+: bills and bonds with more than 180 days to maturity as equally weighted; EQ COMPOSITE: discounted bills and bonds traded on the market as equally weighted.)

Market value weighted indices: (MV 180-: bills and bonds with less than 180 days to maturity as weighted according to market value; MV 180+: bills and bonds with more than 180 days to maturity as weighted according to market value; MV COMPOSITE: discounted bills and bonds traded on the market as weighted according to market value);

3.3. Other Countries: Individual Analysis

3.3.1. Denmark⁹¹

Danish government securities are electronically traded on two systems: MTS Denmark and the Copenhagen SE. MTS is an IDB platform for the PDs. On the SE, a special market segment for Danish GS was established in 2003. Six banks agreed with the DMO⁹² to quote two-way prices for certain securities for at least 95% of the trading time on the SE (firm prices, minimum quantities, maximum spread requirements apply). These market makers compete with the Central Order Book as other SE members can either deal on the market makers' prices or place firm orders themselves.

The initially agreed trading rules

	MTS	SE
Minimum quantity	DKR 100 to 150 million	DKR 4 to 6 million
Maximum spread	5 ticks	10 to 20 ticks

3.3.2. Israel

Organization of the GS secondary market in Israel shows two distinct features. First, two market making venues were introduced simultaneously in 2006: one on the SE and an autonomous inter-dealer system MTS Israel for PDs only. Second, the SE provides some operational support to the autonomous MTS system. Consequently, one can observe a significant increase in the turnover on all trading venues in Israel (the Tel Aviv SE (TASE), MTS and the OTC market).

Prior to 2006, almost all of the small government securities were traded on TASE.⁹³ In 2006, three reforms were implemented: (i) establishment of a PD system; (ii) organisation of an inter-dealer system for PDs (MTS Israel) and (iii) appointment by TASE of market makers for trading GS on the SE. Market makers post two way quotes in the Central Order Book with some minimum amounts and maximum spreads throughout a trading day. Market makers have no priority over other investors in terms of trading or information. Trading on two venues (MTS and TASE) is conducted in parallel.

The TASE clearing house provides some operational services to MTS Israel. It provides clearing services for the trades concluded on MTS Israel, including CCP, by contrast with OTC transactions for which CCP is not available. It provides securities lending to PDs on behalf of the Ministry of Finance, maintains MTS communication network and disseminates MTS trading data.

Trading activity has increased both on MTS and on TASE. The two increases are linked as the trading activity in MTS made it easier for market operators to price bonds in TASE, reducing uncertainty. The reform also encouraged foreign banks to become TASE members.

In 2010, the market share in the turnover on the GS secondary market GS was 81% for TASE, 11% for MTS and 8% for OTC.

⁹¹ "Liquidity and transparency in the Danish Government Bond Market", Jens Andersen and Per Boertelsen (2004);

⁹² Danish Central Bank;

⁹³ Note it was a rather small volume;

3.3.3. South Korea

The Korean GS market is the most dynamic, liquid and well-functioning market in Asia, excluding Japan.⁹⁴

The secondary market of GS is divided in two segments: (i) OTC market⁹⁵ regulated by the Korea Securities Dealers Association (KSDA) and (ii) the exchange market (KRX) operated by the Korea Stock Exchange (KSE). The KSE market was established in 1999 as an inter-dealer market with *an electronic trading platform* offering competitive trading for listed bonds. The KRX market remained largely inactive until 2002.

In 2002, the government made it compulsory for PDs to trade all benchmark issues and at least 20% of total GS volume on the KRX market. In January 2003, mandatory trading requirements were further strengthened with the minimum trading requirement raised from 20% to 40% to further stimulate trading activity.

Mandatory trading on KSE had a positive impact: the volume traded of non-benchmark issues increased alongside the benchmarks volume and more market players were attracted to the KSE. Yet, the rise in exchange trading did not draw liquidity away from the OTC market. On the contrary, trading volumes have increased on the OTC market by a larger percentage than on the KRX market. Therefore, introduction of exchange trading requirements for benchmark issues has helped in improving the overall liquidity of the market. As of June 2011, the market share of KRX is 22.5% in the total bond market, 32% of the T-bond market (KTB) and 50% of the benchmark KTB market.

Year	BOND Market (Total)				KTB				KTB (Benchmark only)			
	KRX	OTC	Total	Market Share of KRX	KRX	OTC	Total	Market Share of KRX	KRX	OTC	Total	Market Share of KRX
2000	26.9	928.2	955.1	2.8%	21.6	251.3	273.0	7.9%	17.3	71.3	88.6	19.5%
2001	13.8	1,401.7	1,415.5	1.0%	10.1	443.1	453.2	2.2%	4.1	166.2	170.2	2.4%
2002	47.9	1,079.9	1,127.8	4.2%	42.6	343.2	385.8	11.0%	11.9	106.1	118.0	10.0%
2003	212.6	1,234.1	1,446.7	14.7%	207.9	453.9	661.9	31.4%	123.6	153.9	277.5	44.5%
2004	377.5	1,439.5	1,817.0	20.8%	358.4	707.8	1,066.2	33.6%	256.8	313.8	570.5	45.0%
2005	365.4	1,541.3	1,906.7	19.2%	337.7	729.3	1,067.0	31.6%	272.8	345.5	618.3	44.1%
2006	295.5	1,341.6	1,637.1	18.1%	267.4	660.1	927.5	28.8%	215.6	338.0	553.6	38.9%
2007	355.8	1,185.5	1,541.3	23.1%	316.7	570.5	887.2	35.7%	183.7	199.7	383.4	47.9%
2008	376.3	1,417.2	1,793.5	21.0%	321.2	603.0	924.3	34.8%	169.3	247.5	416.8	40.6%
2009	504.4	2,073.6	2,578.0	19.6%	427.1	1,057.2	1,484.3	28.8%	225.2	544.4	769.6	29.3%
2010	584.2	2,785.8	3,370.0	17.3%	413.7	1,542.8	1,956.5	21.1%	312.3	673.7	986.0	31.7%
2011	350.1	1,407.2	1,703.4	20.2%	330.1	742.5	1,072.0	30.8%	306.0	346.5	052.0	48.9%
Jan	53.6	226.7	280.3	19.1%	49.1	110.2	159.3	30.8%	43.8	38.9	82.6	53.0%
Feb	44.5	188.1	232.6	19.1%	41.4	95.4	136.8	30.3%	38.0	51.7	89.7	42.3%
Mar	60.4	261.7	322.2	18.8%	55.8	139.8	195.6	28.5%	51.0	84.0	115.0	44.3%
Apr	51.6	223.9	275.5	18.7%	47.5	121.0	168.6	28.2%	44.1	56.7	100.8	43.7%
May	66.3	231.9	298.2	22.2%	61.7	117.6	179.3	34.4%	58.69	65.3	124.0	47.3%
Jun	79.70	274.88	354.6	22.5%	74.55	158.46	233.0	32.0%	70.52	69.95	140.5	50.2%

Source: Korea Exchange.

Source: Republic of Korea, Bond Market Guide, 2011

⁹⁴ JPMorgan Local Markets Guide, 2011;

⁹⁵ The OTC market features both listed and unlisted bonds traded one-to-one between individual investors and securities firms or between financial institutions;

Chronology of reforms		
1996		KSE develops a semi-electronic trading system
1998		Banks are allowed to trade GS
1999		
	February	The government designates KSE as the trading platform for GS dealers as a preparatory measure for the introduction of a PD system
	March	KSE launches an IDB network by dividing its existing automated bond trading system into two sub-markets: a general bond market and an IDB market for government securities
	July	Launch of PD system
2000		
	June	Additional IDB: Korea Money Broker Corporation
	April	Launch by KSE of KTS, a new fully automated IDB trading platform
2002		Mandatory trading requirement for benchmark issues (20% of benchmark trading) on KSE
2004		Mandatory trading requirement raised to 40% of all GS trading to be on KSE

PD system: As of December 2010, there were 20 PDs (12 securities companies and 8 banks). PDs' duties on the secondary market are to quote (inter-dealer) two-way prices on a continuous basis for the on-the-run benchmarks:

- Minimum quantity: KRW 1 million (USD 900,000);
- Maximum bid and offer spread: 400 ticks from previous closing prices (= 4 big figures);
- Minimum turnover on KSE of 40% of total trading volume in GS;
- OTC transactions must be reported within 15 minutes to KOSCOM (the developer of KTS).

KSE IDB trading system (KTS)

- Wholesale market specialized in government bonds;
- Fully automated web based system (developed by KOSCOM);
- Auto-matching plus orders;
- Function: to support PDs' market making;
- Real time disclosure of quoting and trading information;
- The order book displays the 5 best bid and ask prices with the corresponding aggregate quantities;
- Trading is anonymous.⁹⁶

Participants of KTS

- Limited to PDs and government bond dealers.
- Three categories: PDs - committed market makers (24); "Preliminary PDs" – optional market makers⁹⁷ (6); Government bond dealers - price takers (48).⁹⁸
- The participants in KTS need not be members of KSE. A status of "special participant" allows having access to government bond trading only. As of July 2000, out of the 78 participants in KTS, 47 are members of KSE (securities firms) and 31 are special participants (banks).

Other securities are also traded in KTS, such as off-the-run government securities or Foreign Exchange Stabilization Fund bonds as assigned by KSE (one-way quotes). KTS has no membership fees and charges KRW 2.5 per a KRW million traded.

⁹⁶ Seems to be a CCP;

⁹⁷ Applicant PDs;

⁹⁸ These numbers are as of July 2000. A KTS had a total of 78 participants as of this date;

3.3.4. Morocco

Morocco adopted a standard quote-driven trading model used in the most EU countries where (i) market participants are split in two groups (PDs and institutional investors); (ii) trading is tier-based (B2B and B2C, respectively) and (iii) the B2C tier trades on a RFQ basis. Yet, Morocco has innovated by launching a single ETP split into two market segments instead of two separate ETPs for these two groups. This architecture minimizes the cost of the system for the participants (in particular, with regards to connectivity and software).

The single ETP is managed by the market committee composed of the Treasury (as system manager), the Central Bank and the PDs. A system supplier⁹⁹ can be invited to participate in meetings of the market committee when the agenda is relevant. The market regulation drafted by the committee governs the access to and trading rules in the two market segments. A procedure has been designed for the market committee to consult with the participants of the B2C market segment. At the initial stage, the B2B segment will comprise only PDs. The functionalities of the ETP are being tested by the PDs.

3.3.5. Philippines¹⁰⁰

There is a PD system with 41 dealers eligible to trade GS.¹⁰¹ These dealers are licensed by the local Securities Exchange Commission and are approved by the Bureau of the Treasury (the DMO) to participate in the auctions of GS.

There are two exchanges: The Philippines Stock Exchange for equities and the Philippines Dealing and Exchange Corporation (PDEX) for fixed income instruments. PDEX¹⁰² was founded in 2003 with a Negotiated Dealing System for the inter-dealer market including a straight-through processing. In 2006, NDS was complemented with a Central Order Book (Auto-matching System). Additionally, PDEX launched a market maker program to increase liquidity for 12 pre-identified T-bonds.

PDEX currently combines two trading models: a quote-driven OTC-like system for professionals (institutional brokers) and an order-driven SE-like system for the market community, including individuals. It is reported¹⁰³ that the Asian Development Bank advised in 2011 on liquidity improvement of the Philippines bond market and that the working group questioned whether PDEX is the best venue for traditional OTC products other than retail.¹⁰⁴ The PDEX monopoly was pointed out as one of the issues. The report is quoted to have concluded that “trading platforms, settlement, and trade reporting and custody arrangements should all be subject to competition in order to drive costs down. When direct competition is not possible, the Association of Dealers together with the Treasury should have the ability to replace monopoly suppliers”.¹⁰⁵

3.3.6. Poland¹⁰⁶

Government securities are traded on Treasury BondSpot Poland¹⁰⁷ since 2005. BondSpot is a wholesale inter-dealer platform owned by the SE (that already has the infrastructure). The ETP

⁹⁹ Bloomberg system;

¹⁰⁰ Source: PDS group website: “Building the market community”, 2010;

¹⁰¹ 36 banks and 5 non-bank investment houses;

¹⁰² PDEX is a subsidiary of Philippines Dealing System Holding Corp., which comprises three operating subsidiaries: PDEX, Philippines Depository and Trust Corporation and Philippines Security Settlement Corporation. Three major shareholders are the Bankers Association of Philippines, the Philippine SE and the Singapore Exchange;

¹⁰³ Philippine Daily Inquirer “Biz Buzz: Pruning Gov’t securities dealers’ list”, Doris C. Dumlao, 2011;

¹⁰⁴ The working group also recommended decreasing the number of PDs from 43 to 10 in order to make the system more competitive;

¹⁰⁵ Philippine Daily Inquirer “Biz Buzz: Pruning Gov’t securities dealers’ list”, Doris C. Dumlao, 2011;

¹⁰⁶ Source: www.bondspot.pl;

currently comprises 31 participants (some of them are market makers), including 12 PDs. Fixing prices are set twice a day during two fixing sessions.

There are three particular features of the Polish ETP: (i) there is a large number of market makers, some of which are non-PDs; (ii) it is reported that some large trades (up to 5% of the outstanding bond size) have been traded on MTS; (iii) non-banks can see the quotes live-streamed.

3.3.7. Singapore¹⁰⁸

The principal objective of issuing GS in Singapore is to develop the debt capital market by providing a benchmark yield curve for corporate issuances. The government operates on a balanced budget policy. There is a PD system (11 PDs).

Singapore uses Bloomberg extensively. Bloomberg EBND system was initially developed for the Monetary Authority of Singapore. In 2005, EBND added a multi-dealer RFQ system (with the possibility of requesting two-way prices). In three months following the launch of RFQ, foreign ownership of securities more than doubled from 6% to 14%. In 2006, EBND further added an anonymous quotation Bulletin Board showing competing executable quotes which can be hit by orders. The system is an open book. It incorporates a database with eligible counterparts for every dealer and the corresponding credit lines. Subsequently, Bloomberg incorporated a straight-through processing facility for settlement. Dealers have a trade capture mechanism and reporting facilities commission-free. Investors have a real-time view of quotations and market activity. The system does not offer automatic cross-matching. It does not incorporate compulsory market making, but provides quoting and trade performance statistics.

The system allows Singapore to consolidate the primary and secondary market functions (MAS also uses the Bloomberg Auction System –BAS) and to increase cross-border flows (Bloomberg screens are spread across Asia). It minimizes the integration costs for the banks which use Bloomberg's position keeping and risk management system (TOMS). Pre- and post-trade information is available to all participants through Bloomberg. Since July 2011, trading of GS is also possible on the Singapore SE for retail investors. Retail investors can trade through brokers on the secondary market in a manner similar to the way stocks are traded.

3.3.8. Pakistan

The Bloomberg system is used to post live trading prices. The system does not monitor the PDs' compliance with their market making commitment. However, it produces the statistics needed to enable the DMO to do so.

3.3.9. Turkey

Specificity of the Turkish system

Turkey is one of the few countries where the SE plays an important role in the GS secondary market.¹⁰⁹ As of August 2013, the market share of Borsa Istanbul (BI)¹¹⁰ in the GS turnover is 38% vs. 62% for the OTC market. Since creation of an organized market in 1991, the market share of BI has continuously increased up to mid-2009, when it reached a peak of about 65%. The gradual decline in market share observed since 2009 is attributed to increased importance of foreigners in the

¹⁰⁷ It was previously called "MTS Poland Market", successor of "Electronic Treasury Securities Market" (2002-2004). MTS Poland has been bought by the SE, but the kept the same functions;

¹⁰⁸ Sources: www.sgs.gov.sg; Singapore Bond Market Guide, Monetary Authority of Singapore, 2011;

¹⁰⁹ Another comparable country is South Korea;

¹¹⁰ The Istanbul Stock Exchange (ISE) adopted a name of Borsa Istanbul in 2013. The paper uses both terms interchangeably;

secondary market. Foreigners currently hold 26% of the Turkish public debt, but they are not members of BI. They prefer trading OTC.

The fixed income market segment of BI

The ISE was established in 1985 and demutualized in April 2013.¹¹¹ Since 1991, it includes Bonds and Bills Market segment (B&BMS)¹¹² where GS, private sector securities, bank bills and revenue sharing certificates may be traded (Article 5).¹¹³

Participants in B&BMS are (i) the Central Bank; (ii) ISE members; and (iii) banks which are not members of the ISE but have been authorized by the Capital Market Board (CMB) to trade on B&BMS. All market members willing to trade on B&BMS are required to sign “Bonds and Bills Market Letter of Undertaking” that defines general terms and obligations. B&BMS currently includes 125 participants (85 brokerage houses, 11 development/ investment banks and 29 commercial banks.) Exchange members are required to register with ISE transactions with securities listed in Article 5 executed outside the ISE (Article 26). In this case, a registration fee is payable to the ISE (as discussed below).

Trading on B&BMS is conducted electronically via an automated multiple price/continuous auction system which automatically cross matches orders by price and time priority (Article 10). B&BMS is an order-driven market, however designated benchmark securities are subject to market making. Both models (order and quote-driven) are applied to these benchmarks simultaneously, not in parallel. The electronic trading system provided by ISE is currently the only organized electronic trading platform operating in Turkey.¹¹⁴

The Turkish PD system and PDs’ quoting obligation

The Turkish PD system was established in 2000. The PDs (twelve banks) are committed to quote continuously firm two-way prices for certain benchmark securities on B&BMS. For fixed coupon securities, the minimum quantity and maximum spread are the equivalent of about USD 2 million and 50 Kurus (price ticks), respectively.

Specifically, PDs have to quote firm bid and offer prices on every trading day continuously for 6 benchmark securities specified by the Treasury for at least three month period. Six designated benchmarks shall include at least 4 fixed rates, 1 floating rate and 1 CPI-indexed security. The quotations have to meet the following criteria:

- (i) The quotations are posted between 9.45-12:00 and 13.15 -16:00 on every trading day (5 hours);
- (ii) The minimum volume of quotations is TRY 5 mn in nominal terms (USD 2 million);
- (iii) Bids and offers are quoted in terms of prices for coupon securities and the maximum spread between bid and offer quotations is 50 Kurus. For zero-coupon securities, the quotations are posted in terms of simple annual interest yield, subject to the following maximum spread requirements:

¹¹¹ BI still has a large public shareholding (49%);

¹¹² In addition to equities, the ISE also includes a repo/reverse repo segment (ISE reports to be one of the leading repo markets in the World; it has sub-segments for special collateral repos and interbank repos) and a derivatives trading brokerage segment. Special trading rules apply to securities purchased for, or sold from, portfolios of investment funds and investment trusts (Art. 18);

¹¹³ The article numbers quoted in this section refer to the ISE Regulation on bonds and bills market of Istanbul Stock Exchange;

¹¹⁴ This is due to the Capital Market (CM) Regulation. The new CM law (2013) allowed the establishment of other electronic platforms or systems in Turkey;

Interest rate interval (for bids)	Maximum spread between bid and offer (bp)
9.99% and below	0.13
10.00% - 19.99%	0.25
20.00% and above	0.50

(iv) If the quoted quantity falls below TRY 5 mn as a result of a transaction or if a quotation is called back for any reason, a PD will renew the quotation in 5 minutes. There is no minimum secondary market volume requirement for PDs. However, according to the 2012 selection criteria for appointing PDs (for both existing and candidate PDs), FX securities outright purchases and sales on the ISE and off-exchange should not be less than TRY4.6 bn (USD 2.6 bn) for one year prior to the application date.

BI reports to the Treasury only the PDs' failures to comply with their quoting obligation, i.e., when no price has been posted during a period exceeding two minutes or when posted spreads are too wide. There is no reporting on the quality of PD's price quoting performance.

Currently, the PDs' market share in the turnover of outright purchases and sales of GS on B&BMS is marginally below 6%. Seven PDs account for 95% of the PDs' total market share.

Trading and price dissemination on B&BMS

Quotations are anonymous. The identities of the parties are disclosed only upon completion of the transaction. The credit risk is covered by a trading limit collateral system (Article 7). The system accepts four kinds of orders (Article 14): limit, market, and, for either of the above, FAK (fill and kill) or FOK (fill or kill). A member can match his own pending orders upon lapse of a period of time as determined by the ISE (Article 16). Currently, this time period is 10 seconds. Settlement of such trades (cross-trades) is carried out through the ISE settlement procedure.

The system displays the level of the best bid and asks. The best quoted prices are shown to market participants in real time (Article 10). Upon execution of a transaction at the best bid or ask, the subsequent pending best bid(s) or ask(s) are displayed on the screen automatically. Market depth by price can be viewed up to 20 ticks from the trading terminals; from the data vendor screens market depth by price can be viewed up to 5 ticks.

Traded prices are displayed on the screens immediately. They are published in the ISE Bulletin at the end of each trading day together with high, low, weighted average, trading volume and number of trades.

Analysis of the Turkish ETP system

The strategy implemented in Turkey has some similarity with the approach adopted in 2000 by several EMU member states¹¹⁵ that effectively required all PDs to quote firm two-way prices for benchmark bonds on the same IDB electronic trading platform¹¹⁶ to improve liquidity and price transparency. Same as in Turkey, liquidity in the EU has risen on both the electronic and the OTC markets.

Such success of Turkish ETP system is principally attributable to five factors: (i) the obligation of PDs to quote benchmark securities on the B&BMS; (ii) quality of a trading system¹¹⁷; (iii) support of

¹¹⁵ The Netherlands, France, Belgium followed the example of Italy, which had adopted this strategy in the early 1990s already. In all these countries, PDs are free to quote and trade where they please. However, compliance with their price quoting obligations is checked on a particular electronic platform designated by the Treasury;

¹¹⁶ Such as MTS, ICAP, BGC, Eurex bonds, Bloomberg. These are all quote-driven markets;

¹¹⁷ The electronic trading system of the ISE is one of the oldest bond trading systems in Europe, dating back to 1991. It also incorporates a risk management system aiming at decreasing settlement;

the system by the PDs who wished to benefit from a ready to use trading infrastructure¹¹⁸; (iv) the absence of an alternative electronic trading venue(s); and (v) the willingness of ISE to adapt its trading and membership rules¹¹⁹ to support this specific line of business. It could also be the case that relatively wide spread requirements have helped market makers to manage the risks created by transparency of the system.

Fees on B&BMS

Transaction fees are approximately 1/100,000 of traded value except for PDs. It is 0.075/100,000 for PDs, which is approximately the equivalent of Euro 7 per Euro 1 million, or marginally higher than the Euro 5 million level generally charged to market makers in the European GS e-markets.

The registration fee for off-exchange transactions is 2/100,000.

The fee table is as follows:

Fees		
On-exchange	Outright sales and purchases	<ul style="list-style-type: none"> • 0.92125 / 100,000 • 2 / 100,000 (if traded after 2 pm)
	Repo-reverse repo	<ul style="list-style-type: none"> • 0.4803125 /100,000 x Repo Duration • 1 / 100,000 x Repo Duration (if traded after 2 pm)
OTC trades	Outright sales and purchases	<ul style="list-style-type: none"> • 2 / 100,000
	Repo-reverse repo	<ul style="list-style-type: none"> • 1 / 100,000 x Repo Duration
Listing fee	1% of the nominal issue amount (Min TRY 1,000 / Max TRY 10,000)	
Annual quotation fee	1/4 of the listing fee	

¹¹⁸ The PD system was put in place in 2000;

¹¹⁹ Including a transaction fee for SE transactions being lower than the registration fee of off-Exchange transactions;

APPENDIX 1

PROCEDURE FOLLOWED BY BELGIAN, DANISH, DUTCH AND FINNISH PUBLIC DEBT MANAGERS TO SELECT AND APPOINT DESIGNATED ETP(S)

A designated (or recognized) ETP is an ETP selected by DMO to check compliance of PDs with their market making commitment.

A. ETP eligibility requirements

1. In order to be considered a platform must:

- (i) be a regulated market or an MTF under MiFID;
- (ii) offer access to all PDs. Market makers enjoy equal and fair access and are free of membership fee. With regards to transaction fees, platforms are allowed to discriminate between aggressor and aggressed party provided the discrimination is not based upon the status of the participant (be it a market maker or a price taker)¹²⁰;
- (iii) agree to comply with the guidelines set by the Market Committee (see next section);
- (iv) publish current bid and offer prices and the depth of trading interests at prices advertised through its system on reasonable commercial terms and on a continuous basis during normal trading hours;
- (v) provide DMO with the market statistics needed by the DMO to appraise the performance of its PDs and to monitor compliance with their market making commitment. The reporting format is set by the DMO in consultation with ETP and PDs.

2. In order to be appointed:

A platform meeting the above requirements must be recommended by a minimum number of PDs who commit to make markets on that platform. PDs can make markets on more than one appointed platform. However, for the purpose of determining a designated platform, a PD can recommend only one single platform.

3. An appointed platform:

- (i) keeps its status for an initial period of two years. Thereafter, its appointment is reviewed annually in accordance with the aforementioned procedure;
- (ii) is not responsible for ensuring that PDs comply with their quoting obligations. This is the responsibility of the relevant Market Committee.¹²¹

B. PDs

1. PDs are allowed to make markets on any appointed platform at their discretion provided:

- (i) they keep making markets on the designated platform at least 50% of the time for an initial period of at least one year.¹²² The performance of a PD who quotes on more than one appointed platform is appraised throughout the platforms by the DMO.
- (ii) switches from one platform to another are done in a way that does not impair monitoring of compliance with the quoting obligation.¹²³

¹²⁰ The objective is to avoid an indirect barrier for entry of market takers due to high transaction fees;

¹²¹ This provision is meant to address the concern expressed by some platforms that they do not want to get involved in the contractual or regulatory arrangements between DMOs and their PDs;

¹²² This provision is meant to ensure both consistency and flexibility (PDs should trade on a platform they recommended, but should have flexibility in switching to another platform to promote competition);

¹²³ E.g., no switches intra-day;

2. PDs are encouraged, but not obliged, to participate as market takers in all appointed platforms.¹²⁴

3. PDs commit to abide by the internal regulations of every platform on which they quote.¹²⁵

C. Market Committee

The Market Committee:

- (i) **is responsible for organization of the market** (e.g., quoted securities, allocation of securities amongst PDs, minimum amounts, maximum spreads, etc.) **on every appointed platform;**
- (ii) **is composed of all PDs and chaired by the DMO.** A representative of each appointed platform can participate as an observer;
- (iii) **appoints a “Wise Men Committee”** who can sanction PDs for non-compliance with their market making commitment;
- (iv) **issues recommendations to the appointed platforms aiming at standardizing procedures across appointed platforms to the extent possible.**¹²⁶

¹²⁴ With today’s technology, it seems very unlikely any arbitrage possibilities would exist. This also allows flexibility to smaller PDs;

¹²⁵ PDs sign a contract to abide by its regulations anyway. By including this provision, the commitment is reinforced linking it with the status of PD;

¹²⁶ E.g., eligible securities, allocation of securities between PDs, minimum quantities, maximum spreads, minimum opening hours, business days, trade cancellation procedures (to avoid that back-to-back trades cancelled on different platforms are subject to different treatment), clearing and settlement, etc.;

APPENDIX 2

IMPACT OF MiFID ON THE EU GOVERNMENT SECURITIES MARKETS

1. BACKGROUND

The Market in Financial Instruments Directive (MiFID) is a European Union Law that came into effect in November 2007. It replaced the Investment Services Directive of 1993. In both directives, the objective has been to advance securities market integration in the European Economic Area by facilitating cross-border operations and fostering competition.

2. TWO MAIN CHANGES INTRODUCED BY MiFID

2.1. Creation of a level playing field between trading venues, principally regulated markets and MTFs, i.e., primarily Stock Exchanges and e-trading platforms.¹²⁷ MiFID has recognized the emergence of a new generation of organized trading systems alongside regulated markets that should be regulated to preserve the efficient and orderly functioning of financial markets. Both regulated markets and MTFs are substantially similar and are subject to almost identical governance requirements, reflecting the fact that they provide the same organized trading functionality. As an illustration, both must:

- set objective criteria for accessing the system;
- determine the financial instruments that can be traded in the system;
- ensure fair and orderly trading by providing sufficient information for users to make investment decisions and by utilizing objective criteria for efficient execution of orders;
- facilitate efficient settlement of the transactions.

Ultimately, the only difference between a SE and MTF is that the former is a centralized public trading system whilst the latter is a private undertaking that allows diversity.

2.2. Reinforcement of investors protection by strengthening the requirements with respect to (i) pre- and post-trading transparency¹²⁸; (ii) obligation to inform/ advise customers; (iii) best execution rules (execution of customers' orders on best possible terms), etc. With regards to price transparency, MiFID imposes new disclosure obligations on investment firms executing orders away from regulated markets or MTFs.¹²⁹ The aforementioned MiFID provisions reinforcing investors' protection have actually been applied only to the stock market (see section 3.2 below).

3. IMPACT ON THE GOVERNMENT SECURITIES MARKET

MiFID has had an important impact on the structure of the GS market by creating a level playing field between trading venues. It has had no impact on the transparency requirements in the GS market.

3.1. Market structure

¹²⁷ One of the key features of MiFID is removal of concentration rules permitted under the previous directive that required firms in some equity markets (Italy, France) to route all orders to a specific exchange. Instead, firms are permitted to execute on alternative execution venues (SEs, MTFs, through internalization, OTC);

¹²⁸ Pre-trade transparency equates to availability of reasonable bid and offer prices and depth of trading interests on a continuous basis and as close to real time as possible;

Post-trade transparency means disclosure of trades close to real time, except for trades above normal size for which a delayed disclosure is allowed;

¹²⁹ OTC trades in instruments traded on regulated markets in the EU have to be published immediately and, at the latest, within 3 minutes of execution unless the trade qualifies for delayed reporting due to the size of the transaction. Investment firms that internalize a significant amount of their equity order flows are classified as Systematic Internalisers and they are obliged to publish firm quotes in the liquid shares in which they trade.

MiFID has created a level playing field. It promoted a more competitive environment in the European Economic Area by allowing PDs to fulfil their quoting obligations on different platforms.

3.2. Secondary market transparency

The applicability of MiFID’s transparency requirements to the fixed income market, in particular to GS, was subject to heated debates. In the end, the European Commission decided that in the absence of obvious market failures the transparency requirements applicable to stocks would not be extended to these markets. Both dealers and DMOs have argued that there appeared to be no need for regulation in this respect.

Transparency requirements applicable to equities	
Pre-trade	Continuous publication of bid and offer prices and market depth
	For order-driven systems: 5 best levels
	For price-driven systems: best price of every market maker with corresponding volumes
	Exception: Negotiated trades if price within the bid and offer spread; hidden orders
	Also applicable to systematic internalisers
Post-trade	Publication is done close to real time of transactions

3.2.1. The GS market is quite specific in terms of transparency and investor protection:

- (i) **it is a predominantly institutional market:** retail participation is generally indirect (through pension funds, savings schemes, mutual funds, etc.);
- (ii) **there is a high level of transparency:** with the multiplication of ETPs (B2B and B2C), real-time prices are widely available through data vendors;
- (iii) **best execution is guaranteed by B2C platforms** that promote competition between dealers;
- (iv) **close monitoring by DMOs of PDs’ activity** provides an extra layer of customer protection (e.g., the case of Citigroup power trading on MTS in August 2004);
- (v) **price formation is perfect:** the current trading technology has enabled dealers to integrate different secondary market pricing sources into one global market (co-mingled best pages). Traders are often unaware of the source of the prices they trade on;
- (vi) **the market is highly competitive:** the GS market has become a utility both for issuers and for the market as a whole.

3.2.2. GS market is also very different from equities market

- (i) **highly concentrated market:** 12 GS issuers in the Eurozone vs. hundreds of corporate equity issuers;
- (ii) **tightly inter-linked prices:** bond prices vary only slightly around a common yield curve (same as a stock with a beta around one) and the reasons for these variations (credit standing and liquidity) are public knowledge. By contrast, the price of stock is a function of a corporation’s prospects. There are a great many more reasons why the price of a stock can move;
- (iii) **different way of trading:** quote-driven vs. order-driven. In the equities market, the agent is an intermediary matching bids and offers and remunerated by a commission. In the GS market, dealers generally act as principals remunerated by a spread between bid and offer. Dealers thus carry open positions and in seeking cover, they are vulnerable to the “winner’s curse”. This is the reason why voice broking is used for large and complex transactions that, if communicated to the market in real time, would move the market against the dealer. Ultimately, excess transparency would thus damage market liquidity.

4. MiFID II

4.1. Transparency in the fixed income markets has come back on the agenda following the financial crisis. In October 2011, the European Commission started exploring possibility of imposing post trade reporting requirements (price, volume and time) for all bonds, with a time lag subject to the type and the size of the transaction. The prevailing view amongst the main actors in the GS market remains that the liquidity in the wholesale market would be adversely affected by excessive transparency and that the threshold amount for immediate reporting, if any, should be low enough not to affect transactions between professionals.

4.2. MiFIDII introduces a new concept: the Organized Trading Facility - any facility or system designed to bring together buying and selling interests or orders related to financial instruments. The objective is to further widen the level playing field between the various venues offering trading services. Single dealer platforms are tentatively expected to fall within this definition.

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