

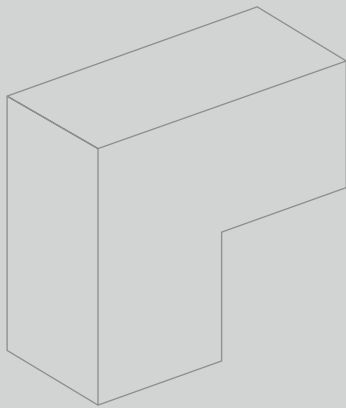
Frontclear Study 1

Repo: OTC or exchange-traded?



frontclear

A financial markets development company



1. Distuishing exchanges versus OTC markets | 7

- A. Two approaches | 9
- B. Trend of market convergence | 13
- C. The exchange drawback | 16

2. Trading fixed income | 18

- A. Recap and study definitions | 19
- B. OTC versus exchange traded fixed income | 23
- C. Impact of ATS | 29

3. Repo exchanges | 33

- A. Frontier markets | 34
- B. Non-frontier markets | 34

4. Observations and conclusions | 38

- A. Observations | 39
- B. Conclusions | 42



Introduction

This study was commissioned by Frontclear Technical Assistance Programme (FTAP), the non-profit technical assistance arm of Frontclear. The purpose of the study has been to assess whether an exchange is likely to be more effective than an over-the-counter (OTC) market in fostering the development of domestic repo trading in emerging financial markets, particularly, frontier markets.

Frontclear's purpose is to facilitate more participative interbank markets. Its commitment is founded on the understanding that well-functioning and deepened money markets ensure that liquidity gets to those that need it most and at the best terms possible. Inclusive and liquid interbank markets depend on a number of key elements per Figure 1. These center on market knowledge, infrastructure, regulation and legislation.

The study of exchange versus OTC markets emerges from the need to develop authoritative market knowledge, grounded on a global review of existing practice. This in light of the quick-paced



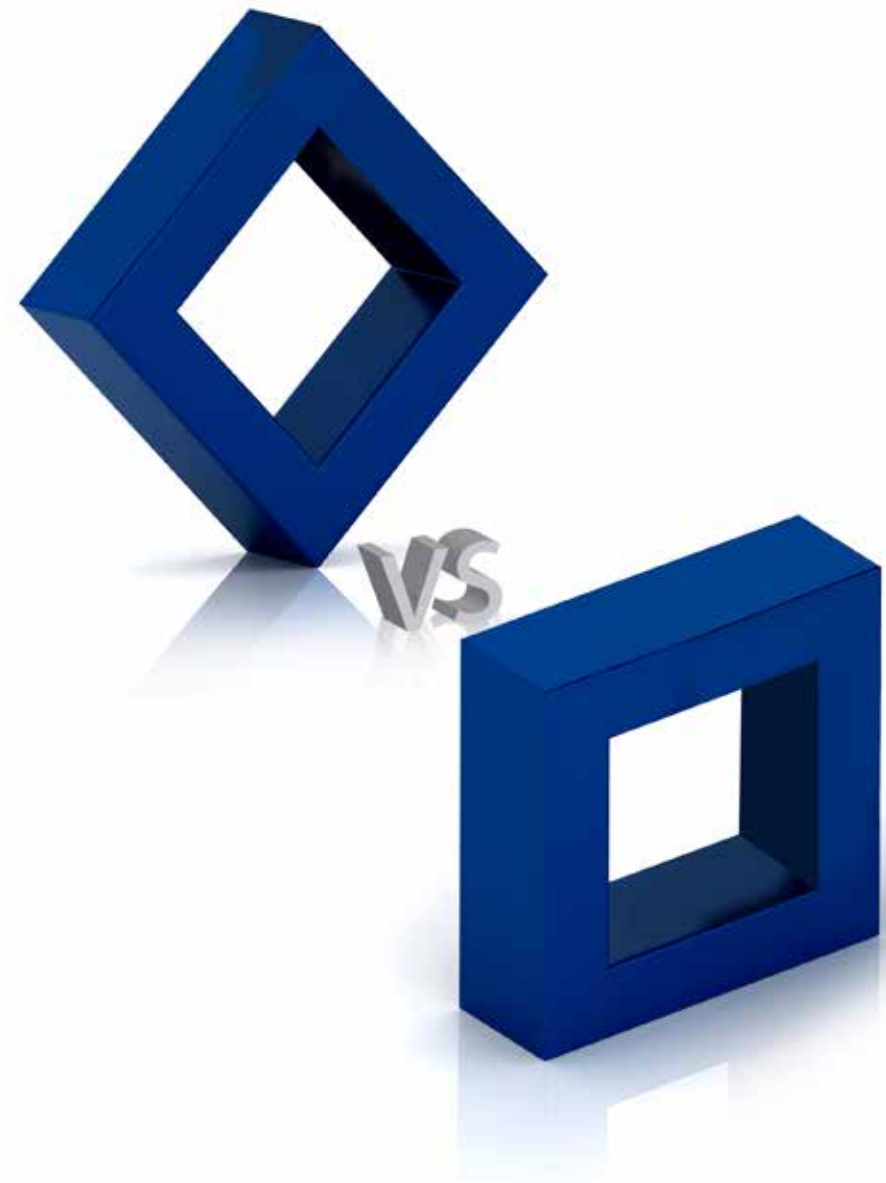
Figure 1
Inclusive & Liquid Interbank Market

1

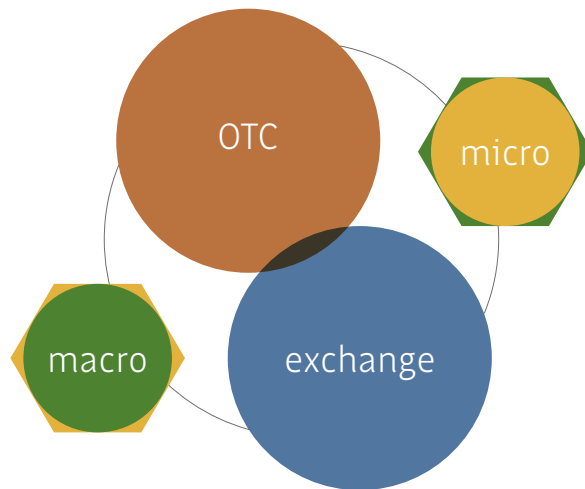
Distinguishing exchanges versus OTC markets

developments and regulatory pressures in emerging markets, to realize hybrid exchange models – models in which OTC is at least partly coupled to an exchange. As such, the study addresses three of the key elements: 1) market liquidity; 2) price discovery & transparency; and 3) trading & settlement systems. (fig.1)

The study's objective is realized by furnishing clear definitions, considering the arguments in favor of and against trading fixed-income repo in OTC markets and exchanges, and assesses market practice by reviewing the empirical evidence as to how repo exchanges have performed against OTC markets. Toward the latter, four repo exchanges – Costa Rica, Kazakhstan, South Africa and Vietnam – have been reviewed. (Annexes can be found at www.frontclear.com.) Complementarily, secondary evidence has been derived from a number of other repo markets analyses, which are presented as cases throughout the study. These include China – where there is intra-country comparison between a repo exchange and OTC – The Philippines, South Korea and European markets. Finally, the study is rounded-off with observations and conclusions.



L A 7 TWO APPROACHES



The first step in this study must be to come to a shared understanding to distinguish an exchange from an over-the-counter (OTC) market.

An exchange is one of the two alternative concepts of trading structure into which markets have traditionally been classified by academics in theory and by regulators in practice. The other is an over-the-counter (OTC) market. However, framing a precise definition of an exchange or an OTC market has proved challenging both in theory and practice. Many exchanges incorporate OTC market features (such as dealers). On the other hand, the definition of an OTC market has been increasingly complicated by the automation of trading in the form of 'automatic trading systems' (ATS), which have made OTC markets look more like exchanges.

There have been two broad approaches to defining and differentiating exchanges and OTC markets:

I¹ an essentially empirical 'macrostructural' approach, which looks at the high-level features and functioning of each type of trading structure; and

II² a more theoretical 'microstructural' approach, which analyses the detailed operational methodology of each type of trading structure.

Macrostructural definitions

Exchanges and OTC markets can both be macrostructural.

The macrostructural approach views an **exchange** as the institutional manifestation of an organized attempt to concentrate liquidity by reducing search costs. The reduction of search costs by an exchange is achieved by the adoption of certain institutional and operational features that together have constituted the traditional form of an exchange. These include the following:

- Bringing buyers and sellers together on a physical **central trading floor** and interacting through 'open outcry' (face-to-face verbal interaction), whereby all members can, in principle, see all orders and have equal chance to trade against those orders.¹
- Offering **pre-trade and post-trade transparency** of price to members in order to ensure the integrity of the market (one price) and enhance its liquidity.²
- The **standardization of contracts**. Reducing the range of contracts by restricting the range of their terms can deepen the market for each.³ In some cases, standardization has made contracts distinct enough to be copyrighted by the exchange which lists them (in the case of listed futures and options).
- The **standardization of trading protocols** to reduce operating costs, including those arising from trading disputes over uncertain contractual terms.

1- Exchanges have often provided different levels of access to the exchange floor to different types of member.

2- As in the case of access to the trading floor, exchanges have often provided different levels of access to trading information to different types of member.

3- Standardization may improve the liquidity of the market but at the cost of increasing the basis risk of users by widening the mismatch between the terms of contracts and the requirements of members.

■ **Restricting access** to the trading floor to members. The aim here is to [1] ensure members are financially sound and operationally competent and [2] allow the exchange to regulate members by arming it with the ultimate sanctions of suspension and expulsion. Restricted access means that non-members (customers) are required to trade on an exchange indirectly through members who are agents called 'brokers'. As agents, brokers do not take anything other than operational risk on orders. Restricted access has often been reinforced by public monopoly and exchanges have typically also been awarded the power of self-regulation. Monopoly powers encouraged the mutual ownership model of corporate governance, as this allows members to ensure that monopoly powers are used for and not against their own special interests (Lee 2000).

■ **Notary** functions such as the listing of securities issues. Exchanges have frequently also provided ancillary services that are not integral to the identity of an exchange but which are seen as adding value to their essential business proposition.

■ **Automatic links** to securities settlement systems and central securities depositories (CSD).

■ **A trade reporting** channel to regulators.

In comparison, the traditional macrostructural characterization of **OTC markets** has been:

■ **Dispersed markets** using bilateral communication technologies such as post, telegram, telex, telephone or electronic messaging, whereby orders can be seen only by parties to whom an approach has been made.

■ **No intrinsic public pre-trade or post-trade price transparency.** While OTC market users can voluntarily contribute prices to information vendors and are subject to increasing regulatory requirements to provide price transparency, it is not required.

■ The **customization of the terms of contracts** is possible on an OTC market but the lack of a central organizer (such as exchange) means that the natural extent to which OTC contracts can be standardized is limited. So, while a lot of OTC trading is in contracts with some terms standardized (often the tenor) and some OTC contracts deliberately mirror analogous exchange-traded contracts (eg IMM swaps match strips of futures), the process of standardization in OTC markets is usually unplanned and bottom-up. OTC market participants always retain the right to negotiate customized trades. The natural limits on the scope for standardizing the terms of OTC contracts means that the instruments in OTC markets have tended to be contracts on ready-made public financial obligations, such as currencies and government securities,

rather than specially tailored private contracts listed on exchanges.

■ **Trading protocols take the form of consensus market conventions.** Thus, some market associations formulate recommendations to guide trading but these are often fairly general and the associations usually lack sanctions to enforce strict compliance.

■ There are **no formal restrictions on participation** in OTC markets, as there is no central organizer to decide on and enforce such restrictions. Access depends largely on bilateral credit criteria and commercial incentives such as the potential scale of business. OTC market users are regulated directly by official agencies.

Microstructural definitions

Academic market microstructure theorists have tended to characterize and differentiate exchanges and OTC markets on the basis of their trading methodologies. Exchanges have been seen as 'order-driven' trading structures, whereas OTC markets have been categorized as 'quote-driven'.⁴

In **order-driven markets** typical to **exchanges**, buy and sell orders are brought onto a single 'order book' through the agency of brokers who have no discretion about whether or not to place orders on the book. Order-driven markets are multilateral in that all brokers can, in principle, be given equal opportunities to accept the orders. Order-driven markets trade both:

■ 'limit orders' – to be executed when the prevailing market price rises above a fixed selling price or falls below a fixed buying price; and

■ 'market orders' – for immediate execution at the prevailing market price.⁵

Order-driven markets can be periodic or continuous trading systems (Cohen et al 1986).⁶ **Periodic trading** is the temporal concentration of liquidity into 'batches' or 'calls'. In essence, orders are 'called' onto an order book (by an announcement of the opening of trading in an instrument) and are accumulated or 'batched' over a certain period, at the end of which, an appointed agent or principal intermediary fixes a price that brings together as many of the buy and sell orders as possible.⁷ This 'call market' is used for illiquid instruments in order to try to avoid excessive price volatility. It is also sometimes used with more liquid instruments as a prelude to the opening of continuous trading or after a trading halt. Call markets have the

4- Ironically, much market microstructure theory has been focused on the role of quote-driven dealers operating inside (order-driven) exchanges.

5- The boundary between limit orders and market orders is not always sharp. 'Aggressive' limit orders are close to market orders. They are intended to be executed immediately provided the price does not move outside a narrow limit.

6- Although some academics also classify dealer markets as continuous.

7- There are several possible fixing methods.

advantage that they can be implemented using cheap technology, which makes them more economical for illiquid instruments and small orders.

Continuous trading is usually implemented on matching systems, which are order books on which trades are automatically struck as soon as a new buy (sell) order introduced into the order book matches or 'crosses' an existing sell (buy) order already recorded on the order book. Most continuous matching systems are electronic but there are manual variants such as board trading systems or the trading pits typical of traditional commodity exchanges using open outcry (Cohen et al 1986). All matching systems require the exchange to impose trade priority rules to determine which orders in a queue are matched first. The design of such rules can be critical in determining the success of a trading system. If the rules of a system do not correctly mimic market practice, traders will be reluctant to use the system. In a continuous market, given that market orders will be executed immediately, order books will accumulate limit orders, for which reason, they are sometimes called central limit order books.

Continuous matching offers more 'immediacy' to market users, which reduces their risk and permits price discovery over an extended period. Other things being equal, continuous trading should make for less volatile price by preventing the build-up of order imbalances.

In contrast to exchanges, **OTC markets** are driven by principal intermediaries called 'dealers'. Dealer markets are **quote-driven**. They are bilateral in that trades are executed between two dealers without any other dealer necessarily being aware of the opportunity to trade. In contrast to brokers, dealers are not obliged to trade (although they can agree to take market-making obligations upon themselves). But also in contrast to brokers, when dealers do trade, they do so for their own account (which means that they take the risk on the trade).

A key characteristic of dealers is that they hold capital against the risk of trading.⁸ Capital allows a dealer to buy and sell at different times by absorbing any losses on the resulting open positions. By being able to bridge the interval between non-coincident supply and demand, dealers can offer immediacy to investors and thereby reduce the risk of investment.

Exchanges sometimes operate **order-driven and quote-driven systems in parallel**. Limit orders from more retail participants are placed onto the order book, which is open to dealers. However, dealers have access only to the order book and not directly to other dealers. Alternatively, brokers can interact through dealers (eg the 'specialists' formerly found on the New York Stock Exchange) but the dealers cannot interact with each other. In other words, there are no interdealer markets on exchanges.

8- Brokers also hold capital but much less and only to cover operational risks.

TREND OF MARKET CONVERGENCE

Macrostructural exchanges and OTC markets have changed greatly since the 1970s, largely in response to the forces of technological innovation, the institutionalization of investment, the globalization of investment portfolios, competitive pressures on cost and regulatory liberalization in pursuit of more competitive markets.

Exchanges have changed the way they operate. In specific:

- Almost all physical trading floors and open outcry trading have been replaced by electronic trading systems in order to reduce cost and widen access.
- Most exchanges have converted to for-profit companies because of the need to raise capital to finance new investment in trading systems. Even moreso because the erosion of monopoly powers by competition from alternative trading structures has reduced the benefits of mutual ownership as a governance model (Lee 2000).
- Conversion to for-profit status has in turn tended to result in the withdrawal by the authorities of the self-regulatory powers traditionally exercised by exchanges because of conflicts of interest between the public good and the private goals of for-profit exchanges. The move to for-profit status has also reduced the incentive to restrict access to the exchange (more members means more profit).
- Conversion to for-profit status and the objective of increasing competition have seen the notary functions of exchanges removed by the authorities.⁹

While traditional **OTC markets** were dispersed and therefore less organized than exchanges, OTC markets have been forced to get more organized by technological innovation, cost pressures and recent regulation.¹⁰ In particular, the introduction of ATS into OTC markets has connected users together in organized networks. The distinction between exchanges and OTC markets has therefore become increasingly blurred.

Regulatory initiatives enforcing competition between brokers and dealers has allowed and encouraged the formation of 'broker-dealers', which are dual-capacity

9- It has been argued that this is one aspect of a broader shift in the focus of exchanges from primary to secondary market activities (Wojcik 2011).

10- Examples of new regulation which have helped breakdown traditional distinctions between exchanges and OTC markets are those intended to reduce systemic risk in OTC markets and to increase competition in exchange-traded markets. The European Market Infrastructure Regulation (EMIR) and the Dodd-Frank Act in the US are forcing standardized OTC derivatives into electronic trading on ATS.

Box 1 | Automated Trading Systems (ATS)

An automatic trading system (ATS) is an electronic platform on which trades are executed by the acceptance of all of the terms of an order advertised on the platform. In other words, there is no negotiation and possible change in terms. On an automated trading system, on the other hand, parties can repeatedly interact with each other to change the terms of the order.

Unlike traditional OTC markets, ATS are order-driven, like exchanges. The difference between ATS and exchanges is that ATS offer dealers direct access to the order book. Orders do not have to be placed on the order book exclusively through brokers or the brokerage arms of broker-dealers, which means that dealers therefore interact directly with each other. In other words, ATS are inter-dealer market trading structures.

It is theoretically possible for dealers on an ATS to be replaced by principals who are end-users. This is the aim of so-called 'peer-to-peer' systems directly matching customers. To date, such systems have not gained traction. But change may just be a matter of time. The overall market role of dealers may already be diminishing. In the US Treasury market, there is evidence of a reduced role for dealers as a result of the greater competition allowed by the widening of access to ATS to include institutional investors and because of cost constraints on dealers' market-making capacity due to new regulations such as the Basel III leverage and liquidity ratios (Joint Staff Report 2015). However, at the moment, the most useful definition of an ATS is an interdealer continuous order book.

firms allowed to trade sometimes as agents on behalf of customers and other times for their own account.

Dealers have been migrating business out of exchanges in markets like equity by matching customer orders in-house against their own positions ('internalization') or against other customer orders ('crossing') in order to avoid exchange fees but also to dampen the market impact of large orders by reducing transparency.

There has also been migration out of exchanges into the OTC market. This has been driven by new technology, which has created ATS that offer trading methodologies tailored to niche types of business.^{11 12}

11- These new entrants have been called 'electronic communication networks' (ECN) and 'alternative trading systems' (ATS not to be confused with ATS meaning automatic trading system).

12- Regulations such as MiFID II/MiFIR are intended to compensate for the resulting market fragmentation by imposing uniform transparency and best execution rules.

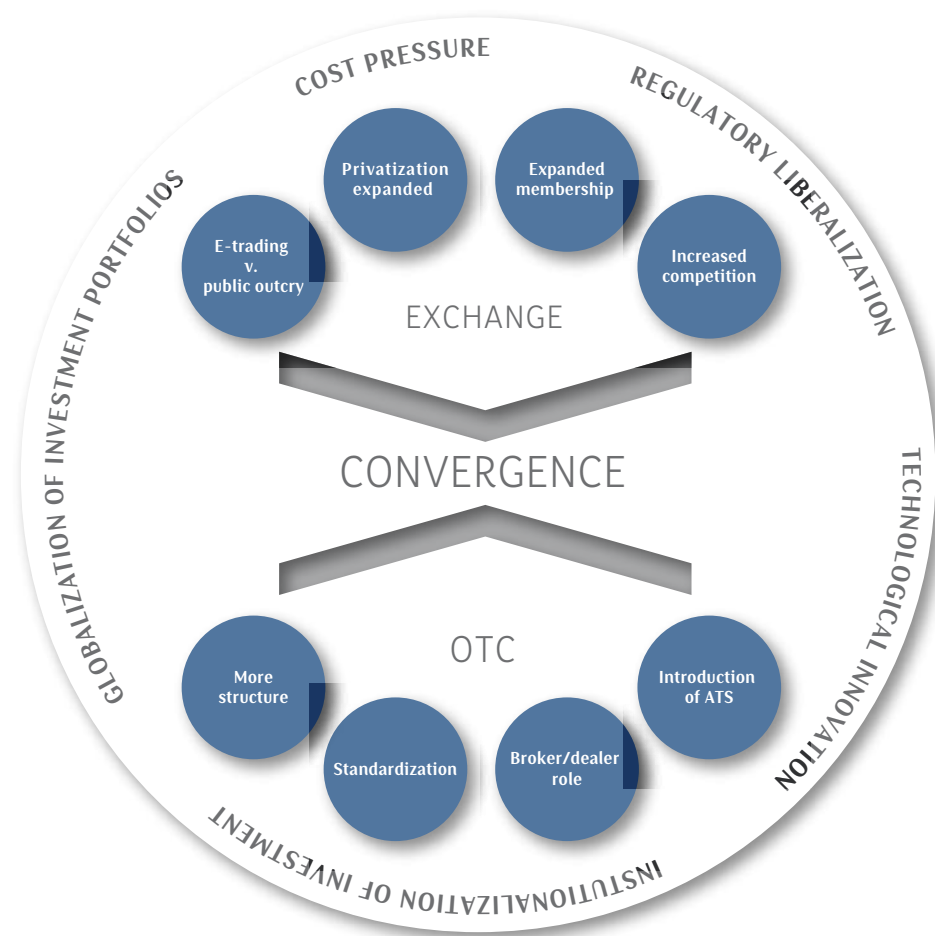


Figure 2
Trends Behind Convergence

THE EXCHANGE DRAWBACK

The **general prevailing criticism** of exchanges revolves around anti-competitive practices. These and institutional inefficiencies stem either from monopolies awarded to exchanges or from incumbent positions built up over time. And even after their monopolies have been abolished, exchanges may continue to benefit from residual regulatory exemptions and preferential legal status, which can give them a competitive advantage over new competitors.

The problems posed by formal or effective monopolies are well known. The lack of competition distorts the allocation of resources and stifles innovation:

- **Inefficient resource allocation** arises because restricted access to trading and/or real-time trade data allows monopoly rents to be extracted through overcharging for brokerage and other services. Complaints to this effect have been made in markets such as The Philippines and Vietnam.

- **Innovation** may suffer because the accumulated resources of a monopolistic or incumbent exchange can allow it to subsidize its existing technology or seize first-mover advantages in the implementation of new technology.¹³ Even if such a move overstretches the exchange's existing business model, it can be too difficult for a new entrant with a better model to persuade users to migrate from a familiar venue. An entrenched commercial position is always difficult to dislodge.

- **Monopolies** and incumbencies can be reinforced informally by the influence which exchanges can exert on policy-makers and official agencies by virtue of their perceived standing as 'national champions' and the strong political connections often built up over many decades. (See lessons from Kazakhstan.) Exchanges also tend to be viewed by the authorities as the 'natural' locus for financial trading (whereas OTC markets tend to look chaotic and free-wheeling, and are difficult for external observers to understand). By concentrating trading in one location, they also provide a convenient institutional means of exercising supervision over an otherwise disparate industry.

In addition, established exchanges often have the resources, expertise and track record to promote themselves as the best candidates to build trading systems for new markets, especially where they have already automated their traditional business.

13- In the repo market, there would seem to be a risk where exchanges have been awarded a monopoly in the cash trading of fixed income or have established a strong incumbent position in cash trading before a repo market emerges. It is notable that exchanges in China, Colombia, South Korea and Turkey achieved high levels of electronic cash trading before successfully branching into repo trading.



Lesson 1 | Lessons from Kazakhstan

One of the very few repo markets where an exchange appears to have prevailed over an OTC market is the Kazakhstan Stock Exchange (KASE). (See Annex 5 for a description of the Kazakhstan repo market). But the success of exchange-traded repo in Kazakhstan is easy to explain and has nothing to do with competition between alternative trading structures. The OTC repo market in Kazakhstan was severely damaged by the Global Financial Crisis and, since 2013, by local credit problems, which led to a drastic reduction in credit limits in the OTC market. In contrast, repos on KASE are perceived by many domestic banks as being risk-free because the principal form of exchange-traded repo, the so-called 'auto repo', is seen as being guaranteed by KASE. In addition, the central bank is active in this market segment, which improves liquidity.

This perception is not actually correct. KASE is not a CCP. But it is assumed that KASE guarantees auto repos because they are pledge-based and the pledged collateral is held by KASE. The misunderstanding has been encouraged by KASE giving anonymity to auto repo. Interestingly, the implicit guarantee of auto repo is not trusted by all banks, particularly foreign ones. Many use post-trade registration of pre-agreed trades. In other words, they trade directly with known counterparties on the OTC market, then register what appears to be an anonymous trade on KASE. Such post-trade registration is a common feature of repo exchanges (eg South Africa and Vietnam).

It should be noted that auto repo became the principal form of exchange-traded repo after mid-2010, when the alternative 'nego repo' market on KASE collapsed. 'Nego repo' is a title transfer instrument which is not actually negotiated on KASE but simply registered post-trade. To this extent, it can be seen as part of the OTC market. The 'nego repo' market collapsed as a result of scandals about the misconduct by brokers. A collapse in the market revealed that the valuation of collateral in many brokered transactions was bogus, which led to a series of defaults.

The only lesson from the Kazakh market is therefore that exchanges may be easier to regulate than OTC markets.

2 Trading fixed income

RECAP AND STUDY DEFINITIONS

The following table summarizes the key traditional characteristics of exchanges versus OTC markets by macro- and microstructural features, as discussed in the previous chapter:

Structure	Exchange	OTC market
Macro	Central trading floor	Dispersed trading
	Pre-trade and post-trade price transparency	No intrinsic pre- or post-trade price transparency
	Standardization of contracts	Customization of the contract terms
	Standardization of trading protocols	Trading protocols take the form of consensus market conventions
	Access through brokers	Direct access
Micro	Order-driven only periodic or continuous	Order-driven or (in case of ATS) continuous quote-driven

If any of the following characteristics are present, it would be conclusive macrostructural evidence of an exchange. However, these particular characteristics are not essential to an exchange. In other words, the following conditions are sufficient but not necessary for an exchange:

- A **monopoly** on trading. In some cases, trading monopolies have dwindled to an obligation to simply report trades, even where those trades have been negotiated off-exchange. Of course, it would be possible for a monopoly to be awarded to a new ATS operated by an exchange but this is unlikely given that the appearance of ATS has coincided with the trend away from monopolies and given their private status. On the other hand, an ATS owned by an exchange could benefit where a parent's monopoly has not yet been removed.
- A physical **central trading floor** (but not an electronic trading system). Very few exchanges retain such a facility, most having installed electronic trading systems in their place. But given their historic role, it would be difficult to argue that an institution that retained a physical central trading floor was not an exchange.



Case 1 | The Philippines repo market

Structure

The Philippines repo market was launched in August 2008 and is located on the Interprofessional Repo Market of The Philippines Dealing and Exchange System (PDEX), a subsidiary of The Philippines Dealing System Holdings Corporation (PDS). The exchange operates an order-driven trading system. It allows the trading of repos against government securities only. Trading is open to dealers (currently 15) and, as cash lenders only, designated professional investors (currently 14). Orders are given pre-trade anonymity but there is no CCP. Instead, members can limit their exposure to others. Collateral revaluation and variation margining is managed on a third-party basis by the CSD – The Philippines Depository and Trust Corporation (PDTC). Collateral is blocked at the CSD during the life of a transaction and cannot be re-used, except to be liquidated after a default by the seller. Repos traded on PDEX benefit from lower reserve requirements than OTC repos. Repo business on the exchange reached a daily peak of under USD 30 million in 2009 but appears to have dwindled to zero by March 2012.

Dissatisfaction with PDEX prompted the Money Market Association of The Philippines (MART) to propose, in 2011, that the authorities support the re-establishment of an OTC interbank repo market by abolishing their prohibition on short sales and Documentary Stamp Duty on OTC repos. GMRA enforceability was confirmed by local legal counsel and MART has drafted OTC trading guidelines and developed an approach to meeting the regulatory requirement for transaction reporting (through the use of the Bloomberg messaging platform – E-Bond). The MART initiative has received official support, as it chimes with plans to set-up a primary dealer system in government securities as part of a wider set of reforms aimed at reinvigorating the local bond market. The OTC market is due to be launched in 2017.

Lessons

Analysing the performance of PDEX history is complicated by the changing economic and financial context, and by the regulatory and fiscal burdens which have disadvantaged OTC repo. The reason for the switch to the OTC market is unlikely to be PDEX's trading technology given that the MART-proposed Bloomberg messaging system hardly offers superior technology. Other explanations include:

- Insufficient participation to generate the critical mass needed to generate adequate liquidity, which could reflect the cost of membership and/or transaction costs.
- Concerns about the risk stemming from pre-trade anonymity without the protection of a true CCP.
- Compulsory delegation to the CSD of default management and collateral liquidation.
- The legal framework underpinning repos traded on the exchange is cursory and is not supported by a legal opinion.
- With no right of re-use of collateral, there is a risk of the courts re-characterizing exchange-traded repos as secured loans subject to the statutory insolvency regime.

Yet another possible reason is that PDEX initially prospered as a source of liquidity for banks in the aftermath of the Great Financial Crisis. In other words, it functions as a cash-driven market designed to push cash from professional investors to dealers. In contrast, the MART proposal is driven by an express wish to reform the securities market, in particular, the setting-up of a primary dealer system in government securities. Given that collateral for exchange-traded repos is blocked and cannot be re-used and that non-dealers can only be buyers, PDEX is not capable of acting as a means of securities borrowing for dealers.

LB7

OTC VERSUS EXCHANGE TRADED FIXED INCOME

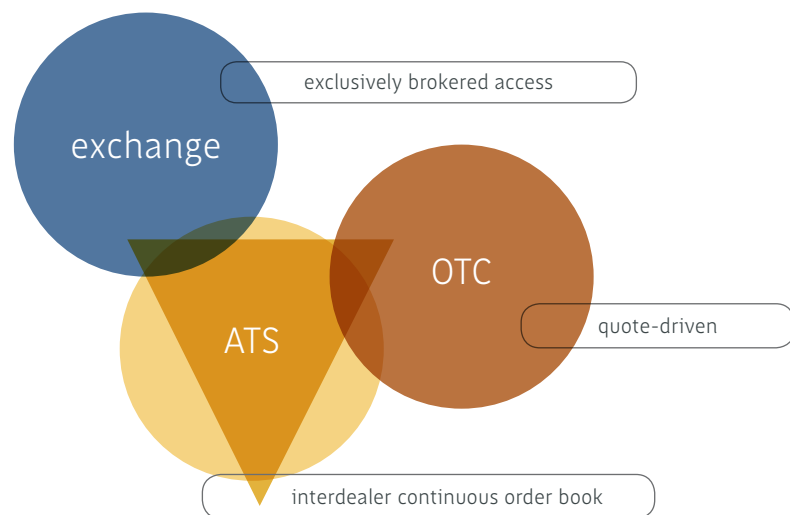
■ **Standardized contract terms** are only circumstantial evidence of an exchange, since ATS in the OTC markets also have to standardize their contracts in order to automate trading.

■ The same is true of **standardized trading protocols**. Standardization is therefore a necessary but not sufficient characteristic of an exchange.

The only necessary and sufficient macrostructural condition for an exchange would seem to be **exclusively brokered access**, a requirement that orders can be brought onto the order book of an exchange only through the agency of a broker or the brokerage arm of a broker-dealer who is a member of the exchange. Although dealers may be allowed to assist brokers to trade on an exchange, they are not permitted to introduce orders and therefore cannot interact with each other. Without exclusively brokered access, there is no meaningful institutional difference between an exchange and an ATS.

The exclusively brokered access definition of an exchange means that, for example, Eurex Repo and MTS Repo in Europe are not repo exchanges, merely ATS that happen to be owned by exchanges, since these platforms are designed to provide direct access by and allow interaction between dealers. There is no requirement for orders to be introduced through brokers.

In conclusion and for the purpose of this study only, a market is considered an exchange if it features '**exclusively brokered access**', OTC when it is **quote-driven** and an ATS if it is essentially an **interdealer continuous order book**.



It is accepted wisdom that bonds and other fixed-income instruments (including fixed-income repo) do not trade successfully on traditional exchanges but instead require an OTC market (which includes ATS). Major reforms to fixed-income markets have often included the abolition of exchange monopolies on fixed-income trading. This has been particularly evident in the fixed-income repo market. Thus, the Spanish repo market grew strongly after a reform in the 1980s that moved government debt out of the stock exchange. The development of the UK repo market in 1995 was preceded by the 'Big Bang' reforms that included the elimination of the privileged role of the stock exchange intermediaries in the analogous securities lending market for government debt (Gemloc 2010). There was a similar story in France in 1994.

It is also notable that in many countries in which exchanges retain a monopoly in fixed-income trading, execution is actually conducted off exchange in the OTC market and trades are only reported to the exchange. This is the case in South Africa and Vietnam. It is true for a lot of business in Kazakhstan and it was true in the UK before the Big Bang reforms.

Explanations for the attraction between fixed-income securities trading and OTC market, focus on the interaction between the character of fixed-income instruments and the trading structure of OTC markets.

Illiquidity

A key characteristic of fixed-income securities is that they are less liquid than the equities or types of derivatives traded on exchanges.

Illiquidity is most apparent in the case of non-government fixed-income securities, where issuers are likely to have many more fixed-income issues than types of equity issue and each fixed-income issue is customized in terms of coupons, maturities, preference/subordination, covenants and other features.¹⁴ The customization of fixed-income issues limits the width of the investor base for each issue. The limited number of investors per issue, together with relatively small issue size of credit securities, the buy-and-hold tendency of many investors and the negotiation that is required to trade in such an opaque market, means that orders tend to be infrequent.

In the case of government fixed-income securities, illiquidity reflects the need to trade in large deal size in order to be able to efficiently shift issues on the scale

14- In the eurozone alone, according to the ECB, there are over 700,000 fixed-income issues, compared to about 7,000 equity listings.



Case 2 | The China repo market

Structure

The China market is segmented into 1) the OTC-style Interbank Market (IM) and 2) the exchange-traded market (split between the Shanghai and Shenzhen Stock Exchanges). The IM was created in 1997 specifically for commercial banks only but its membership has been gradually expanded to include many of the institutions on the exchanges. The IM is the largest market segment, although there has recently been a rapid expansion in the share of the exchange-traded market due to the regulatory requirement and encouragement of mutual funds to trade on the exchanges.

The entire exchange-traded market and the IM (around 97%) are pledged repos. The IM also trades so-called 'outright repos'. These are described as sale and repurchase transactions but suffer from significant legal uncertainty about title transfer. As with pledged repo, there is no right of re-use of collateral. Virtually all the collateral in the market is illiquid, which means the market is almost entirely cash-driven.

IM repos are mainly traded on a system called CFETS (China Foreign Exchange Trade System). CFETS offers a range of trading methodologies for repo, including bilateral quotation, request-for-quotes (RFQ) and a central limit order book. The latter is similar in many respects to the ATS found in other countries, except that it is not a pure interdealer system and is more akin to a peer-to-peer system given the wide range of users. However, since 2015, the CFETS central limit order book has offered a facility called X-Repo, which is effectively an interdealer ATS in that access is restricted to the most active market participants. However, most IM repo trading appears to be executed directly and reported to CFETS post trade. A lot of trading on the exchanges follows this pattern too.

Trading on the exchanges is guaranteed by the CSD, which is the China Securities Depository and Clearing Corporation (CSDC), although it is not structured as a CCP according to international standards. Trades on the IM are cleared by two other CSDs. The CSDs all offer some collateral management services (principally collateral selection) but there is no full tri-party service.

The division of the repo market between the IM and the exchanges is largely based on the type of collateral and counterparty. The IM has a monopoly on all trading of bonds issued by banks other than policy banks but dominates Treasury bonds, policy bank bonds and enterprise bonds. The exchanges have a monopoly of corporate bonds and are the main market for bonds issued by NBFIs. In the IM, the large policy banks lend to small banks and NBFIs. On the exchanges, from which banks are excluded, funds tend to flow from NBFIs, corporate and individuals to other NBFIs. Trading on the IM is mainly about liquidity management. On the exchanges, it is financing carry trades, usually in riskier securities and often by retail investment schemes.

Lessons

The IM is the dominant repo market segment in China because it is home to the major liquidity-providers, which are the policy banks. The exchanges have struggled to compete with the IM and have tended to rely on preferential treatment by the authorities (eg the monopoly of money market mutual funds), specialization in riskier collateral, access to retail investors and the CCP-like guarantee by CSDC.

Care has to be taken when trying to draw conclusions from the China repo market as neither the IM nor the exchanges trade true (title transfer) repo. However, the fact that the central limit order books on both market segments tend to be by passed in favour of direct bilateral trading is fairly clear evidence of a preference for the traditional OTC market.



Case 3 | South Korea repo market

Structure

Like China, South Korea repo market has both an exchange-traded and OTC segment. Also as in China, the OTC market accounts for near all repo activity at some 80-90%. The OTC market is divided into 'institutional' and 'customer' segments. The institutional segment falls under a self-regulatory organization called the Korea Securities Dealers Association (KSDA). Trading tends to be via four brokers, who have accounted for as much as 75% of the OTC market (ASEAN+3 2012). The institutional segment is used mainly by securities companies and securities trusts (47% and 32% respectively, in June 2012) to borrow from asset managers (31%), the Korea Securities Financing Corporation (16%) which is responsible, among other things, for investing retail deposits held by securities firms and banks for liquidity management purposes. The OTC market is therefore cash-driven. The CSD, which is the Korea Securities Depository (KSD), provides tri-party services to the institutional OTC repo market. The customer segment of the OTC market is largely used by individual retail investors (typically through collective investment schemes), corporate investors and bank trusts to lend to securities companies but also to banks, merchant banks, KSFC and some public financial institutions. The market is used by sellers to finance carry trades in money market instruments such as certificates of deposit (CD). The customer segment of the OTC market is therefore an essentially retail market. Customer repos may not be true repo as collateral is said to be 'blocked' in the CSD. However, this legal risk does not appear to discourage business on this segment of the market.

The exchange-traded market is operated by the Korea Exchange (KRX). KRX also acts as a CCP, guaranteeing the settlement of exchange-traded repo. Since 2006, KRX has also provided tri-party collateral management services. This market is mainly used by the KSFC to lend to primary dealers. Sellers on KRX must specify the issue to be provided as collateral; buyers can do the same or indicate that they will accept any eligible issue allocated by KRX. In other words, they can trade general collateral (GC). The range of eligible securities is narrower than on the OTC market and there are standardized tenors and amounts for quoting and trading. The exchange-traded market is divided into interdealer and primary dealer markets. In contrast to China, it is therefore an institutional repo market yet does not seem to compete directly with the institutional segment of the OTC market. And it is clearly designed to be securities-driven.

The repo market as a whole has benefited from the regulatory policy of pushing the money market out of unsecured call money into repo. One incentive has been to exempt OTC customer repos from deposit insurance and reserve requirements, which means they pay higher returns than deposits and are therefore more attractive to investors (KTB 2013). This has helped the OTC market to dominate repo trading.

On the other hand, membership requirements imposed by the exchange could be a relevant factor in discouraging use of the exchange. To become a member, firms need to acquire an extra regulatory license, sign a special repo trading agreement, register as a participant and set up a connection. Nonetheless, the share of OTC repo has declined in recent years. This is due to official intervention to bolster exchange-trading. Since 2002, primary dealers have been forced to conduct a minimum share of their business on KRX.¹ The exchange market has also been boosted by official business and as noted, it benefits from central clearing.

Lessons

On the basis of the 'exclusively brokered access' definition of an exchange and given the de facto dominance of brokers in the OTC market, that market segment could arguably be seen as an exchange rather than an OTC market notwithstanding its direct trading methodology. But the South Korea market can still provide an insight into the relative performance of exchanges and the OTC market. Given that the exchange-traded market in South Korea was designed to be securities-driven and interdealer, it should have been more conducive to fixed-income repo trading. The fact that it has required official preference in order to gain market share tends to support the argument that exchanges suffer from a comparative disadvantage in trading any form of fixed-income.

1- The impact of the requirement imposed on primary dealers to make markets in KTB benchmarks on KRX can be seen in the shares of cash trading on the KRX. At end-June 2012, KRW accounted for 23% of all bond turnover, but 31% of Korea Treasury Bonds (KTB) and 49% of KTB benchmarks (ASEAN+3 2012). Even taking into account, the wider range of securities eligible to trade OTC, the differences in shares is significant.

typically made by governments and to satisfy the scale of demand from the largely institutional investor base.

Liquidity in all fixed-income securities is also affected by the dramatic inventory changes due to redemptions and new issuance (changes not found in equity).

Order flow

The infrequent order flow in non-government fixed-income securities and the lumpy order flow of government fixed-income securities make the automatic matching of orders inefficient. In contrast, dealers in OTC markets are able to bridge the intervals between infrequent orders by using their capital to absorb the risk of carrying positions between the occurrences of non-coincident buy and sell orders. This provides the immediacy required by institutional investors.

Transparency

In addition to the link between the illiquidity of fixed-income securities and the dealer-driven microstructural nature of OTC markets, there are macrostructural features that attract fixed-income (and some other) trading to OTC markets.

The greater transparency of exchanges compared to OTC markets results in much smaller average deal size on exchanges, since the exposure of large orders to the market is likely to adversely move the price. The small average deal size has made exchanges suitable for small-order retail-orientated markets such as equity but less accommodating to large-order wholesale markets such as fixed-income securities, money markets and more complex derivatives such as interest rate swaps.

The small order size resulting from the greater transparency that is typical of exchanges means higher overheads and diseconomies of scale.¹⁵ In order to generate adequate revenue, small order size needs to be offset by large order flows. And coping with large order flows means standardization of contracts. Accordingly, exchanges have tended to dominate the trading of naturally more standardized instruments such as equities and have failed to retain or capture the trading of more heterogeneous instruments like fixed-income securities.

15- Small average order size means exchanges have a problem in trading the large orders ('blocks') that are generated by the institutionalization of investment. Brokers and dealers can, of course, break up large orders into smaller lots to spread among counterparties. But exchanges can assist by supplementing continuous matching with special arrangements to reduce transparency, such as allowing negotiation to take place off-exchange and for the subsequent publication of the result on the exchange in a process called 'put-through'. Another approach is for the exchange to allow the partial display of large orders, followed by the gradual display of the remainder of these 'hidden orders' or 'iceberg orders'. In addition, some exchanges publish indicative prices before trading opens to help give members a feeling for the depth of the market. An alternative approach is to exploit small order size for high-frequency trading (HFT), in which risk is controlled by taking small but rapidly-changeable positions.

The OTC market has been able to successfully trade fixed-income instruments because it is possible, in a bilateral market, to privately negotiate orders for more complex instruments such as credit fixed-income securities, forward foreign exchange and derivatives such as interest rate swaps.

IMPACT OF ATS

It has been notable that migration to ATS has been accompanied by dramatic reductions in average deal size (a change made practicable in many cases by the availability of automated order handling). The OTC markets in which there have been large-scale migrations to ATS are in spot foreign exchange, very short-term government bond repos and to a lesser extent, cash trading in government securities. In this way, the markets in these instruments have adapted to more transparent multilateral trading, although the anonymity provided by CCPs has mitigated the reduction in deal size in the case of repo.¹⁶

It is also notable that the instruments which have migrated to ATS share certain key characteristics with typical exchange-traded instruments, namely, simple transaction structures and inherently low loss-given-default (LGD). Structural simplicity is a basic requirement for automation. Low LGD relaxes the credit constraints on trading. Spot foreign exchange and cash trades in government securities that are settled delivery-versus-payment (DvP) have low LGD because they do not involve any extension of credit, while short-term government bond repo has minimal duration and is collateralized with high quality assets.¹⁷ Low LGD also makes CCP willing to extend guarantees on these products, which offers the benefit of anonymity. This in turn mitigates the impact of transparency on individual dealers (competitors cannot gauge their positions).¹⁹ ²⁰

16- Another role that CCP have played in the success of ATS in the repo market has been highlighted by the strategic battle that took place in Europe in the first decade of the century between ATS offering CCP-cleared anonymous repo (BrokerTec and Eurex Repo) and ATS offering non-cleared name-display repo (MTS Repo). In the end, despite first-mover advantages, MTS Repo conceded the contest by connecting to a CCP. It had originally chosen counterparty name display because of the fragmented nature of its home market in Italy and the consequent diversity of counterparty credit risks. Name-display allows credit assessment and the filtering of potential counterparties, and is cheaper than a CCP. Among domestic banks, who were already familiar with their counterparties, this approach was not a problem but opening new credit lines would have been an unwelcome cost for new cross-border parties. Trading through a CCP requires only one credit line. It was largely to attract cross-border business that MTS Repo switched to CCP clearing.

17- Settlement risk in spot foreign exchange is increasingly mitigated by use of Continuous Linked Settlement (CLS).

18-Exchange-traded products are limited to equity settled delivery-versus-payment and relatively simple standardized derivatives.

19-However, the role of clearing houses in equity may have as much to do with providing anonymity as reducing credit risk (which is low given delivery-versus-payment settlement). Anonymity is important in equity, given the high risk of adverse selection in such an idiosyncratic instrument (Comerton-Forde et al 2011).

20-The hypothesis that automation is limited to simple, low-LGD instruments would appear to be challenged by the existence and success of Italian ATS called e-MID. This is an electronic platform set up in



Case 4 | Europe repo market

Structure

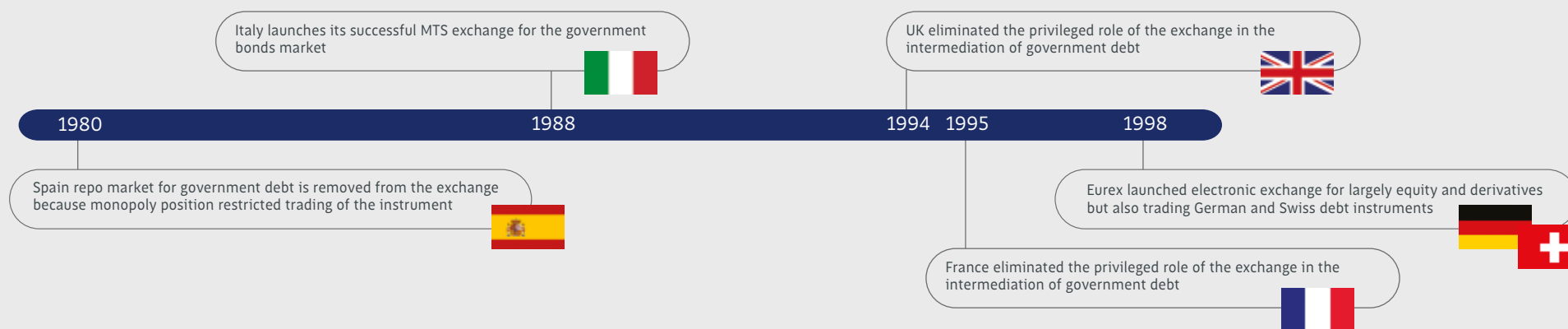
The European experience is that securities-driven repo is naturally attracted to the OTC market, albeit having shifted sideways into ATS. There has been no demand for true exchange-traded repo accessed exclusively through brokers. Moreover, the establishment of a successful GC financing market by Eurex Repo in the form of the Euro GC Pooling market, which is an ATS, has demonstrated that cash-driven repo (at least title transfer repo) also prefers the OTC market.

While there are no examples of repo trading naturally shifting from OTC markets to exchanges, short-term government bond repo is one of the instruments that has substantially migrated from the traditional OTC market to ATS. This has been despite the unwelcome transparency imposed by ATS. This migration has been facilitated by the character of short-term government bond repo (simplicity of structure and low LGD). However, the driver of the migration has been the saving in transaction costs arising from the automation of low-margin short-term repo trades. The switch to ATS has only been feasible for such a large-order market because of CCP clearing of ATS-traded repo. CCP clearing is needed in order

to offset the disadvantage of smaller deal size with anonymity for the long order flow into which large orders have to be broken up in order to avoid adverse market impacts. Multilateral netting by CCP also significantly reduces the balance sheet cost of intermediation, which are considerable for repo.

Lessons

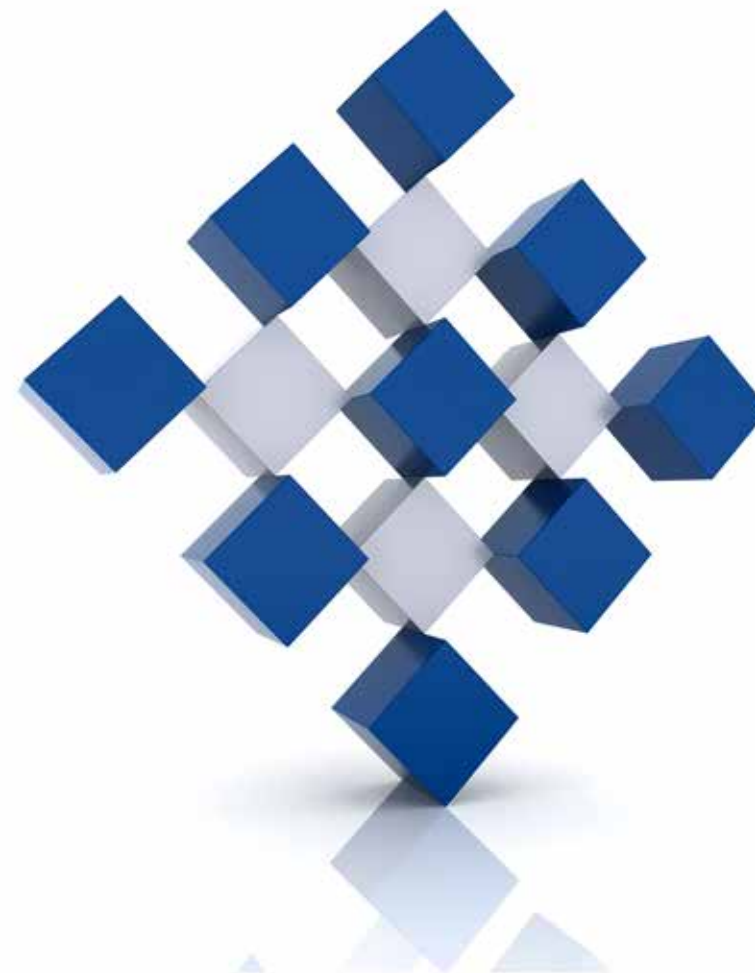
The European experience is therefore that securities-driven true repo has remained within the OTC market, albeit having shifted sideways into ATS. There has been no demand for true exchange-traded repo accessed exclusively through brokers. Moreover, the establishment of a successful GC financing market by Eurex Repo in the form of the Euro GC Pooling market, which is an ATS, has demonstrated that cash-driven true repo also prefers the OTC market.



It is informative that ATS have not successfully evolved beyond the dealer-driven model that essentially defines OTC markets. The performance of peer-to-peer ATS has to date been disappointing.²¹

The problem of trading fixed-income instruments on exchanges poses a fundamental challenge to the viability of a true 'repo exchange', although not to the trading of repo on ATS owned by exchanges.

L3 Repo exchanges



1990 for interbank trading of unsecured deposits. Unsecured deposits are simple but not low risk, as they are not collateralized like repo. Notwithstanding that Italian banks were probably actively 'encouraged' to sign up to e-MID by the central bank, which would have created an expectation of official underwriting (something that would appear to have been confirmed by a guarantee scheme extended by the central bank during the Global Financial Crisis), e-MID has been successful (at least until the crisis in 2008, prior to which, it accounted for as much as 17% of eurozone unsecured interbank deposits). However, risk on e-MID is minimized by the fact that most deposits are overnight and by the small deal size (quotes must be good for up to EUR 1.5 million but trades can be as small as EUR 50,000). And dealing on e-MID does not actually increase the existing risk of participation for banks in the unsecured deposit market. The rationale for e-MID is the very highly fragmented Italian banking system (almost 800 banks prior to 2008). In these specific circumstances, automation offers much reduced transaction costs, at least for the larger banks gathering interbank deposits from the smaller banks.

21- There are successful one-way primary market distribution platforms such as US TreasuryDirect and secondary market distribution platforms such as TradeWeb but the former is not a true trading system and the latter relies on dealers to provide quotes upon request.

From a list of 148 countries classified as emerging financial markets, 34 (23%) have been identified as having a repo market, of which, at least 15 (44%) have a repo exchange. These figures stem from a survey of the world's repo markets (summarized in Tables 1 and 2 to follow). The fact is that exchanges thus constitute a significant proportion of repo markets. But the definitions used have been deliberately loose. Market organizers describing themselves as repo exchanges have been taken at face value. In addition, repo markets have been included which trade secured loans incorrectly labelled as repos (where collateral is subject to a security interest rather than conveyed by title transfer). Finally, a number of repo markets with minimal turnover might have been included.

FRONTIER MARKETS

Of the 148 emerging markets, 127 were also 'frontier' markets. Of these, 24 (19%) have a repo market, of which, at least 12 (50%) are run by exchanges. And six of the 12 (50%) possible exchanges are in Central America – Costa Rica, Dominican Republic, Ecuador, El Salvador, Nicaragua and Panama. Four of the other exchanges are in Central and Eastern Europe. Out of the six frontier market exchanges offering repo trading, only Costa Rica and Kazakhstan have active repo markets. However, Costa Rica is not a true (title transfer) repo market and the same seems to be true of the other Central American markets. The most active repo segment of the Kazakh exchange (so-called 'auto repo') is also not true repo.

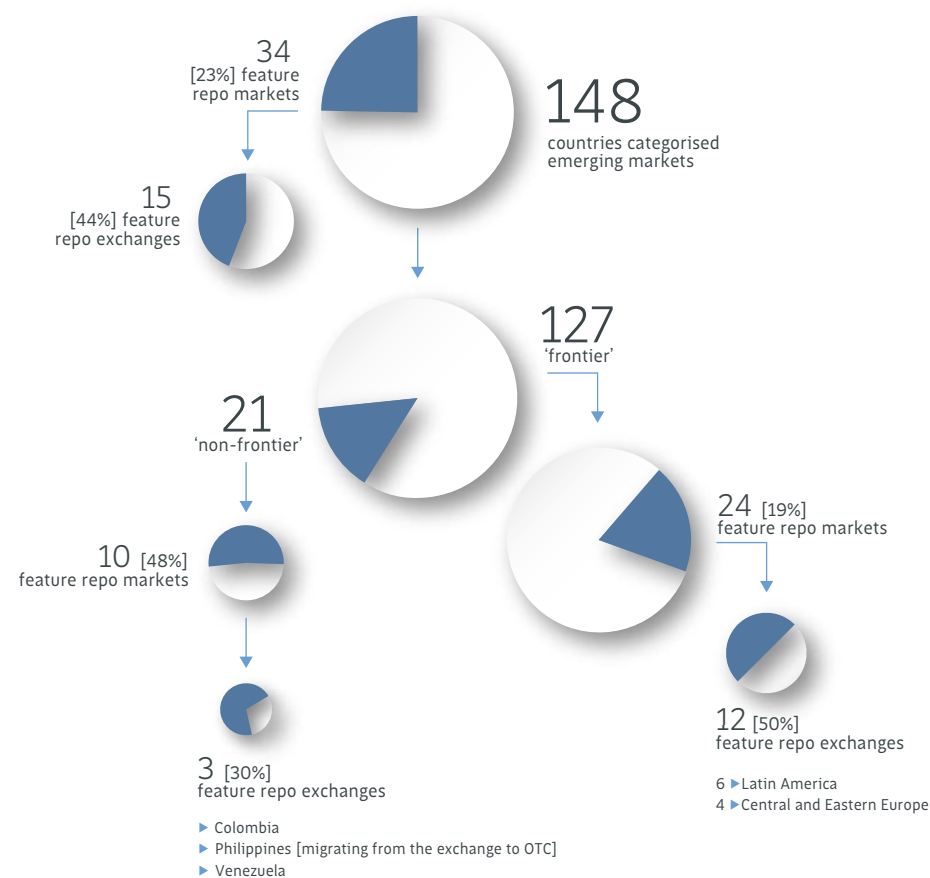
NON-FRONTIER MARKETS

Of the 21 non-frontier emerging markets, 10 (48%) – Argentina, Colombia, Jamaica, Malaysia, Morocco, Nigeria, The Philippines, South Africa, Thailand and Venezuela – have repo markets. In theory, six of these (60%) are operated by exchanges, Colombia, The Philippines, South Africa, Venezuela and Vietnam (Colombia also has an OTC repo market). However, South Africa is like Vietnam. Repos are traded OTC and only reported to the Johannesburg Stock Exchange (JSE). And the exchange-traded market in The Philippines no longer appears to be active (see fig. 3).

There is a project underway in Nigeria to bring repo trading under the supervision of a self-regulatory organization (FMDQ) that describes itself as an 'OTC exchange' but discussions with the SRO suggest that even the first stage, which will be limited to a reporting requirement, is unlikely to be implemented within the next two

years. The most active non-frontier emerging OTC repo markets are to be found in Argentina and Jamaica in Latin and Central America, and Nigeria and South Africa in Africa. All these markets appear to trade title transfer repo.

Figure 3
Emerging markets and repo



- ▶ South Africa and Vietnam [not considered repo exchanges as the only feature a reporting function]
- ▶ Nigeria [today only carries only a reporting function however, the role to migrate trading to an exchange is in review]

TRANSITIONAL MARKETS

The classification of emerging market excludes 'transitional' markets (ie non-OECD industrialized economies).²² With the exception of Hong Kong, they are among the most successful non-OECD repo markets.

Table 1 | OTC v exchange-traded repo markets

	frontier markets	other emerging markets	transitional markets
OTC	Bangladesh	Argentina	Brazil
	Bulgaria	Jamaica	China
	Egypt	Malaysia	Hong Kong
	Georgia	Morocco	India
	Kazakhstan	Nigeria	Indonesia
	Kenya	South Africa	
	Kyrgyzstan	Thailand	
	Pakistan		
	Peru		
	Serbia		
	Sri Lanka		
	Tanzania		
	Trinidad & Tobago		
exchange	Azerbaijan	Colombia	Brazil
	Belarus	Philippines	China
	Bosnia-Herzegovina	Venezuela	Hong Kong
	Costa Rica		Russia
	Dominican Republic		
	Ecuador		
	El Salvador		
	Kazakhstan		
	Nicaragua		
	Panama		
	Vietnam		

22- Using OECD membership to distinguish transitional and developed economies has numerous drawbacks. Arguably, if Brazil, China and Russia are classed as transitional, there is a case for including

Table 2 | True repo v pledged loans

	frontier markets	other emerging markets	transitional markets
true repo	Bangladesh	Argentina	China (outright repo)
	Georgia	Colombia (simultanea)	Hong Kong
	Kazakhstan (nego repo)	Jamaica	India
	Pakistan	Malaysia	Russia
	Peru	Morocco	
	Serbia	Nigeria	
	Sri Lanka	South Africa	
	Trinidad & Tobago	Thailand	
pledged loan	Bosnia-Herzegovina	Colombia (repo)	China (pledged repo)
	Costa Rica	Philippines	
	Dominican Republic		
	El Salvador		
	Kazakhstan (auto repo)		
	Kenya		
	Panama		
	Tanzania		
	Vietnam		

Analysis of the relative performance of exchanges and the OTC market in the trading of repos is complicated by the difficulty of distinguishing an exchange from the OTC market, particularly where the OTC market trades on an ATS. Once again, for the purposes of the study, an exchange was defined as a marketplace that has to be accessed exclusively through the agency of brokers, while a traditional OTC market is quote-driven and an ATS is an interdealer continuous limit order book in an OTC market.

Chile, Mexico, South Korea and Turkey. South Korea has an OTC market in true repo. Chile, Mexico and Turkey have exchange-traded markets in true repo. Turkey also has an exchange-traded market in pledged loans. Chile, Mexico and Turkey therefore complicate the picture summarised in Tables 1 and 2. Chile and Mexico reinforce the suggestion that there is a common driver towards exchange-trading in Latin America.

4

Observations and conclusions

OBSERVATIONS

A number of observations can be drawn from the review of four repo exchanges complemented by empirical evidence across other markets.

Exchange-traded repo

As one might expect for advanced sophisticated instrument such as repo, a smaller proportion of frontier markets trade repo than emerging markets in general. However, the reliance on exchanges is similar. The concentration of exchange-based repo trading in frontier Central America is notable (60% of the exchanges). In contrast, repo markets in frontier Africa are all OTC, as are three out of four in Asia and 57% of repo markets in frontier Central and Eastern Europe.

There is relatively more OTC than exchange-trading of repos in non-frontier emerging markets. Among this group, there are six OTC markets: Argentina, Jamaica, Malaysia, Morocco, Nigeria and Thailand. There are just three exchanges, The Philippines, South Africa and Venezuela but trading in South Africa, in reality, is OTC. Colombia has both an exchange and an OTC market. And The Philippines exchange is moribund.

Frontier market exchange-traded repo has a high proportion of pledged lending (47%) rather than true repo, whereas repos in non-frontier emerging markets are mainly title transfer instruments. In most transitional markets, repos are title transfer, with the notable exception of all exchange-traded and most Interbank Market repos in China.

Given that eight of the 15 emerging and transitional countries with exchange-traded repo only are in Latin and Central America and only two from this region are exclusively OTC (Colombia has both types of market), there appears to be a strong bias in that region towards exchange-trading which suggests a common driver. It has been suggested that this might be the demonstration effect that neighbors have on each other within the same region.

In addition, the fact that the cash trading of bonds was well established on active exchanges in Latin and Central America before repo markets emerged, may have influenced the location of the latter. In this respect, exchanges in the region are distinguished from the rest of the world by their specialization in fixed income and money markets rather than equity. The regional demonstration effect was certainly a factor in the case of Kazakhstan (which looks towards Russia).

In the case of Anglophone countries in Africa and Asia, the prevalence of OTC markets may reflect the relative institutional weakness of the local exchanges.





Figure 4
Benefits and Costs of an Exchange

‘Pseudo-repo’

Three-quarters of frontier market exchange-traded repo are pledged lending rather than true repo. The largest of the transitional markets (China) is also overwhelmingly pledge-based. It is also worth mentioning that, in India, the market in pledge-based Collateralized Borrowing and Lending Obligations (CBLO) is much larger than the parallel true repo market.

The success of pledged loans as an alternative to true repo is based on the legal, operational, regulatory and commercial benefits of not having to deliver pledged collateral to cash investors. The collateral is instead blocked by the central securities depository (CSD).

■ There appears to be a **legal** expedient in favor of pledged loans because of the uncertainty in many jurisdictions about the enforceability of collateral title transfer under a true repo. In jurisdictions operating a civil code, security interests may be the only legitimate collateralization mechanism allowed. Where there is limited judicial experience of financial markets, courts may struggle to reconcile the economic character of a repo as a meaning of borrowing and lending with a true sale of collateral, in which case, it can be easier for the market to apply existing law on security interests. Unfortunately, the legal expedient of a pledged loan typically hides another problem: when a borrower defaults, the rights of the cash investor to collateral in which he has only a security interest is likely to be subject to interference by the insolvency regime (eg Kenya 2015 and 2016).

■ There is also an **operational** expedient in favor of pledged loans. They avoid the need for cash investors to have to manage collateral securities. Blocking securities is a much simpler and cheaper mechanism than delivery to the cash investor and allows less sophisticated cash investors into the market.

■ The use of a security interest also precludes short selling by the collateral-taker, which may be prohibited by **regulation** or discouraged by the authorities.

In countries without an active secondary market in government securities, there is no commercial reason for delivering collateral. Repo markets exist primarily to support dealers in government securities. Many emerging markets do not actively trade government securities, so do not need title transfer for business purposes. In contrast, liquidity management is an imperative in all money markets and pledged loans perform this cash-driven function well enough, at least from a business perspective (albeit subject to legal and risk management weaknesses).

It is easy to see why pledged loans might be considered more suitable than true repo for liquidity management. However, the legal vulnerabilities of loans backed

by security interests have often been mitigated, or at least disguised, by official support. Measures include encouraging or mandating the use of exchanges as a trading venue. For example, in China, pledged repo takes place on the Interbank Market under a master agreement published by the self-regulatory organization called NAFMII. In India, the CBLO market is operated and backed by a CCP (CCIL) and clears in central bank money at the Reserve Bank of India (RBI).

But while pledged loan markets can facilitate liquidity management, they cannot support securities trading. It is notable that none of the countries which rely exclusively on pledged repo markets have active secondary markets in securities. As these develop, the use of pledged repo becomes a problem. In China, there have been increasing calls for the replacement of pledged repo with true repo in order to enhance the secondary cash market in securities. In India, the RBI has sponsored the establishment of a true repo market to operate alongside the CBLO market for the same reason. The Philippines provides another example.

CONCLUSIONS

The received wisdom is that the OTC market outperforms exchanges in the trading of fixed-income securities and, by extension, fixed-income repo. However, there are a number of repo markets in which exchanges appear to be at least holding their own. But a closer look at these examples reveals that some exchanges actually play no real role in repo trading or a smaller role than is initially apparent. Thus, in South Africa and Vietnam, the exchanges offer no trading facility and act merely as a trade data repository. Trades are actually executed on the OTC market and only reported to the exchange post-trade. In Europe, exchanges own and operate the ATS on which repo trading is conducted but these systems are separate from the traditional business of the exchange.

In other cases, the apparent (relative) success of the exchange is the result of official intervention to redirect business onto exchanges or other incentives, including CCPs (China, Kazakhstan and South Korea). Where an exchange is being sustained in the face of competition from the OTC market, it will fragment the market and reduce overall liquidity. Consideration needs to be given to alternative ways of transacting the essentially retail business which exchanges often exist to serve. It needs to be remembered that repo is a credit instrument, something which exchanges were not invented to trade. In developed markets, retail credit is intermediated by banks, which have the appropriate credit management capabilities, rather than exchanges.

The challenge for exchanges would seem to be the nature of fixed-income

trading. The order-driven trading which is characteristic of an exchange struggles to cope with the sporadic and lumpy order flow of fixed-income markets (except where this is confined to the interdealer space, which is how ATS succeed in the OTC market). The challenge for exchanges is compounded by their intrinsic transparency, even where CCPs are available to mitigate the problem. Consequently, even where exchanges offer trading facilities, it is common to find a significant share of trading conducted off-exchange (China and Kazakhstan).

Another key reason that many exchanges struggle to compete with the OTC market in the trading of repo is that they offer, not true (title transfer) repo, but secured loans incorrectly labelled as repo. Not only are secured loans legally less secure but they can only support cash-driven markets as, without transfer of title, collateral is not available for use in the securities market. In the case of The Philippines, the failure of the exchange appears to be due to its inability to support a securities-driven market because its product is actually a secured loan. In India, this drawback of secured loans has prompted the creation of a true repo market separate from a successful secured interbank loan market.

In conclusion, the available theoretical and empirical evidence supports the argument that the OTC market tends to outperform exchanges in the trading of true repo. The most successful model is based on an interdealer ATS. On the other hand, exchanges are commonly used to trade secured loans, notwithstanding serious legal and risk management concerns.

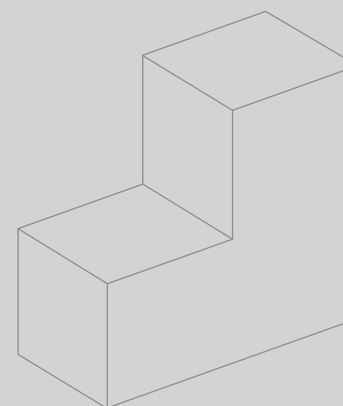
This conclusion does not imply that exchanges cannot play a role in building repo markets. They may be the best or only institution in an emerging market with the resources, organization, experience and standing to do so. They can also provide regulatory convenience in the form of established trade reporting and are likely to have connections in place to the local securities settlement system and CSD. For these exchanges, there are important lessons to learn from Europe, where two exchanges have succeeded in building and operating efficient repo trading systems, not as part of the traditional exchange, but as separate interdealer ATS allowing direct access and no requirement to use brokers. The fact that these European exchanges adopted this successful strategy probably reflects the commercial discipline instilled by having to compete with each other and standalone ATS across a regional marketplace. In smaller markets, competition is unlikely to be sufficient, in which case, there would need to be some form of official supervision to prevent monopolistic behaviour.

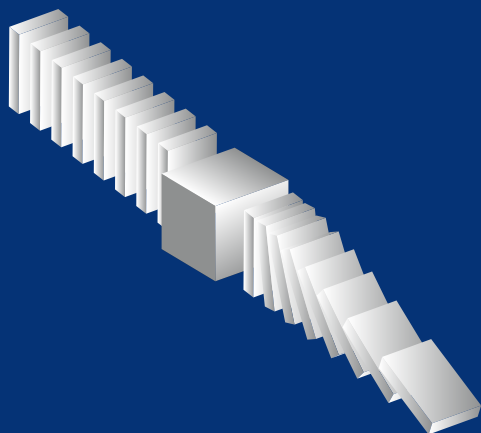
Whatever choice is made about the trading structure thought to be most appropriate to a particular country, deciding between an OTC market or an exchange is only one element in developing a successful repo market. Repo also requires a well-organized administrative framework as well as the existence of complementary markets in cash and securities that are or have the potential to become liquid.

The administrative framework for repo provides its legal foundations and defines its tax, accounting and regulatory treatment.

- To function efficiently, repo markets require certainty about the enforceability of title transfer, particularly in the case of an insolvent counterparty, and the ability to net obligations after a default (cash against collateral and one repo against another).
- Parties will also require a robust master agreement clearly setting out their contractual rights and obligations. This agreement should be consistent with or based on the standard international master agreement, which is the GMRA, in order to benefit from the accumulated expertise and experience, and to allow easy integration with the global market.
- There must be no tax obstacles, such as taxation of the purchase or repurchase legs, or double taxation of coupon or other income paid on collateral.
- Parties will need the incentive to invest in repo front and back office systems that is provided by regulatory recognition of the risk mitigation offered by high quality, liquid collateral. And there can be no prohibition on short-selling or repo is made de facto into a secured loan.
- There also needs to be clear guidance on the proper accounting treatment of repo or parties will be reluctant to start trading.
- And new markets require nurturing with education and information.

In terms of complementary markets, repo requires a ready and adequate supply of high quality, liquid securities for use as collateral, typically government securities. Adequate supply depends on a structured primary market issuance programme aimed at building deep pools of liquid benchmarks and an active secondary market supported by primary dealers. Primary dealers will provide the main motive force behind the development of repo, as they are core users of the product. Their activity will also enhance the liquidity of the securities, which improves their usefulness as collateral. It is at this point that the choice of an appropriate trading structure becomes key.





frontclear

A financial markets development company