JOHANNESBURG STOCK EXCHANGE

Fixed Income Survey: findings and conclusions

Created by	Monica Ambrosi
Reviewed by	Siobhan Cleary
Quality assured	
Approved by	
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Version	V2

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1. References

Document	Author	Issue date
BIS Quarterly Review	Bank for International Settlements (BIS)	December 2009
Bond market development indicators	World Bank: Financial Sector Operations and Policy	2006
Bond market settlement and emerging linkages in selected ASEAN+3 countries	Asian Development Bank	June 2005
Deepening local capital markets in emerging market countries (Seminar Summary Report)	The Centre for Emerging Market Enterprises, the Fletcher School, Tufts University	April 2008
Derivatives market survey 2009	World Federation of Exchanges (WFE)/IOMA	May 2010
Foreign participation in emerging markets' foreign currency bond markets	International Monetary Fund: Working Paper (WP/10/88). Shanaka J. Peiris	April 2010
G8 Action Plan for developing local bond markets in emerging market economies and developing countries	G8 Finance Ministers; notes from meeting held in Potsdam in May 2007	2007
Improving liquidity in government bond markets: what can be done?	Bank for International Settlements (BIS) Papers, No. 11: M.S. Mohanty	2002
Recommendations for securities settlement systems (Consultative Report)	Committee on Payment and Settlement Systems (CPSS) and Technical Committee of the International Organization of Securities Commissions (IOSCO)	January 2001
Secondary market liquidity in domestic debt markets	Organization for Economic Cooperation and Development (OECD)/World Bank/International Monetary Fund (IMF) 10th Annual Bond Market Forum	April 2008
The implications of electronic trading in financial markets	Bank for International Settlements: Working Group established by the CGFS of the central banks of the G10 countries	January 2001
World Bank Statistics	www.worldbank.org	
World Federation of Exchanges Statistics	www.world-exchanges.org	

2. Version control

Version	Author	Date	Reason for changes
Version 1	Monica Ambrosi	17 March 2010	Preliminary findings
Version 2	Monica Ambrosi	17 June 2010	Update of preliminary findings

3. Introduction

In November/December 2009 the Johannesburg Stock Exchange (JSE) conducted a fixed income survey on behalf of the World Federation of Exchanges (WFE) of which it is a member.

The survey questions were prepared by the JSE, in consultation with the exchange's Interest Rates Division. They were structured so as to obtain an understanding of the structure, size and importance of domestic fixed income markets as viewed by WFE members and to assess certain aspects of related fixed income derivatives markets. In addition, the survey aimed to identify common themes across these two market segments.

The survey was disseminated to all the WFE members and associates via electronic mail. Respondents were given the option of both completing and submitting the survey attached in Word Document format, or of following a link to a website which enabled them to complete and submit the survey via the internet. The majority of participants responded by submitting the completed Word Document via electronic mail to the JSE.

The survey was first circulated to WFE members on 27 November 2009, and subsequently to WFE associates on 24 December 2009. The deadline for the submission of responses was 15 January 2010.

It should be noted that the terms fixed income, debt and bond markets are used interchangeably in this report, as in the survey.

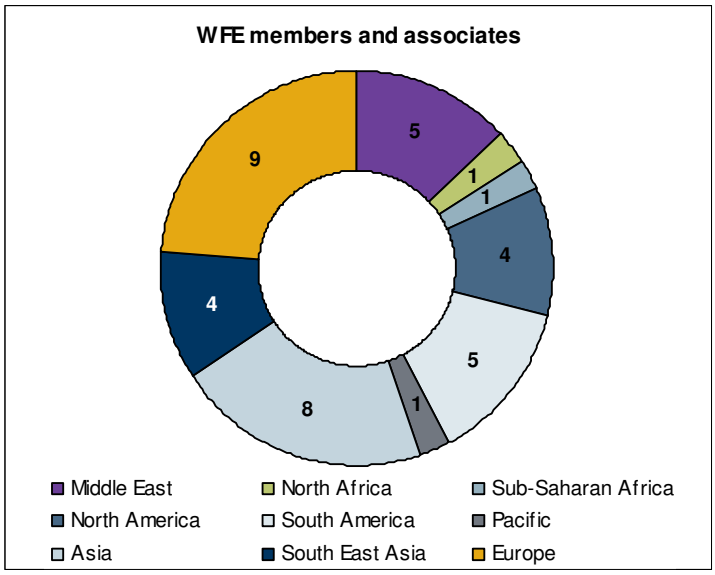
4. Response statistics

The population of the survey comprised the following:

- 52 members of the WFE;
- 6 associates of the WFE (see Annexure 1 for complete list).

A total of 38 responses were received, comprising 36 responses from WFE members and 2 responses from WFE associates, resulting in a total participation rate of 65.5%. Among the respondents were 8 of the 10 largest exchanges by value traded in the fixed income markets, as per the data reported monthly to the WFE. The geographical distribution of the respondents is shown in Figure 4.1.

Figure 4.1



A number of respondents were not able to provide input to the survey as they do not cater for the trading of fixed income instruments or fixed income derivatives on their exchanges. This is either because of the financial market's structure and/or size, which is such that bonds and/or derivatives are rather predominantly traded over the counter, or because bonds and/or derivatives are traded on another national exchange. Among such exchanges are the Osaka Securities Exchange, the Stock Exchange of Tehran, the Philippines Stock Exchange and the Taiwan Stock Exchange. The Financial Industry Regulatory Authority (FINRA) and LCH Clearnet, both associates of the WFE, are not exchanges and were therefore also unable to complete the survey, while the Chicago Board Options Exchange (CBOE) and the CME Group only provided responses to questions pertaining to the fixed income derivatives market, since they are derivatives exchanges. The International Securities Exchange was unable to participate as it neither operates a fixed income market, nor a market in related derivatives products.

5. Survey findings

The survey findings are presented per section, corresponding to the survey layout (a copy of the survey is presented under Annexure 2).

5.1 Section 1

Questions in Section 1 of the survey pertain to bond market development indicators. In a World Bank study (the Financial Sector Development Indicators Study) conducted around 2004/2005, the Bank proposed a multidimensional system to diagnose the dimensions of bond markets in countries. The indicators identified through the study can be divided across the four dimensions of the financial system – size, access, efficiency and stability (see Tables 5.1.1 and 5.1.2).

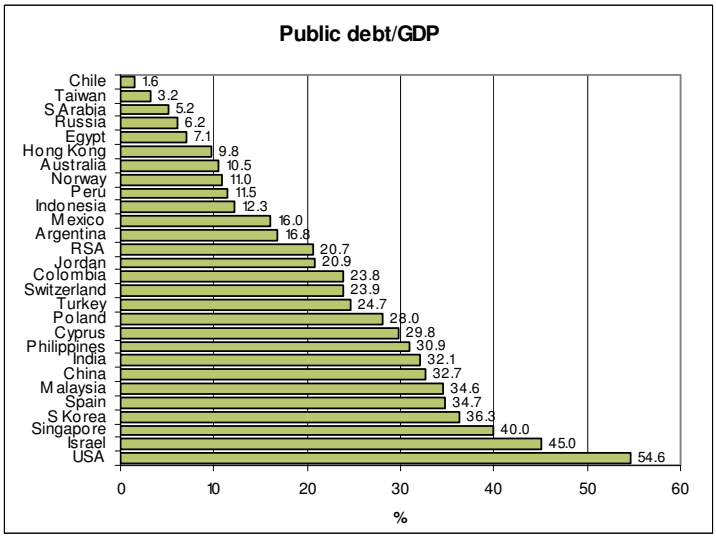
Table 5.1.1

Bond Market Indicators in World Bank's FSDI	
Size	**Efficiency**
Ratio of private sector bonds to GDP	Quoted bid-ask spreads (10yr government bond yield)
Ratio of public sector bonds to GDP	Turnover of private sector bonds on securities exchange
Ratio of international bonds to GDP	Turnover of public sector bonds on securities exchange
Dummy variable: existence of bond market	Settlement Efficiency Index
Dummy variable: existence of corporate bond market	
Access	**Stability**
Government bond yields (3mths and 10 yrs)	Volatility of sovereign bond index
Ratio of domestic to total debt securities	Skewness of sovereign bond index
Ratio of private to total debt securities (domestic)	Ratio of short-term to total bonds (domestic)
Ratio of new corporate bond issues to GDP	Ratio of short-term bond to total bonds (international)
New corporate bonds issued ($ billion)	Correlation with German bond returns
	Correlation with US bond returns

The questions in Section 1 were thus structured to highlight at least one of the indicators per dimension, in order to gain some insight into the developmental phase and depth of bond markets across the countries in which the exchanges surveyed operate. In order to further track changes over time, the data were required for 2000 and 2008. The exchanges were requested to provide those indicators thought to be easiest for them to compile. However, many respondents to the survey failed to provide this information. Consequently, through data obtained by the

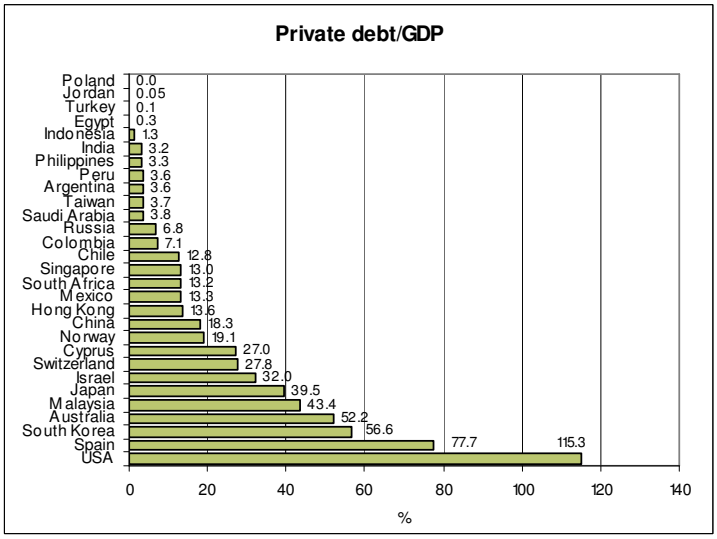
World Bank and the Bank for International Settlements, the required data were collated for some countries, barring those for which it is not available in a standardised format. Where no data could be collated but exchanges provided some or all of the necessary information, the latter was used.

Figure 5.1.1



As a reflection of the "size" dimension of bond markets, respondents were requested to provide the ratio of public sector bonds to GDP (Question 1.1) and the ratio of private sector bonds to GDP (Question 1.2). The size of an economy plays a pivotal role in determining the development of financial markets and thus the existence of a securities exchange for the trading of securities. According to the World Bank study, countries with small financial markets tend to have a small bond market. Figures 5.1.1 and 5.1.2 depict the findings with respect to bond market size for those countries for which the data could either be compiled or was provided through the survey answers. The data pertain to 2008.

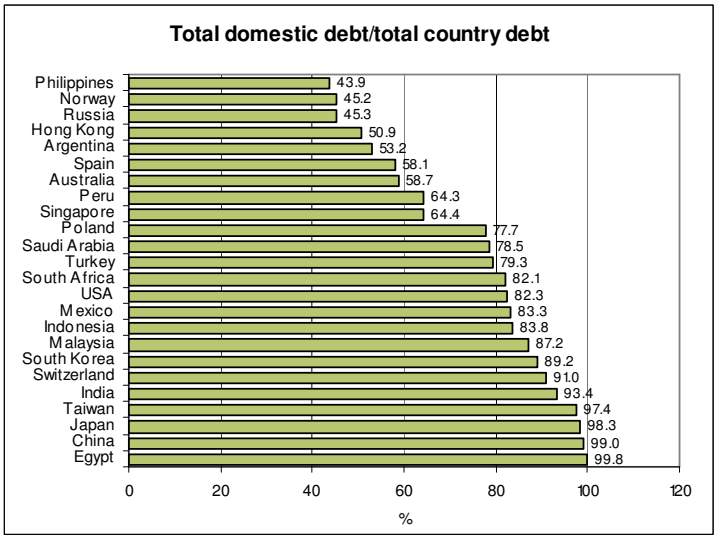
Figure 5.1.2



According to the International Monetary Fund, government bond markets have several characteristics that distinguish them from private debt markets. These may include, for instance: minimal credit risk; high liquidity and a wide range of maturities; well-developed market infrastructure (including supporting repo and derivatives markets). Not all of these are necessarily present, or present to the same degree, in all government bond markets. Government bonds also play important roles: they serve as hedging vehicles; vehicles for funding financial market positions and managing liquidity; they are instruments for investment and position-taking on the level of interest rates; they are safe-havens.

In very mature markets, government issuance can over time contract, leaving space for corporate debt issues to grow. Thus, in some instances, a low public debt/GDP ratio can be a sign of market maturity or a consequence of fiscal policy. Nonetheless, even in well-developed bond markets, steady government debt issuance remains key for the general efficiency of the debt market. Research (Edey and Ellis, 2002) shows that governments that attempt to, on average, balance their budgets during the course of the business cycle, will eventually eliminate their debt[1], even if only during the stronger phases of the business cycle. Unless they seek to maintain a gross debt position (through financial asset accumulation), such governments could find themselves trying to raise government debt during cyclical downturns, which is not ideal. In addition, low bond supply levels can impact on bond market liquidity, that is, the ability to trade significant volumes of bonds without causing substantial market price movements. Ultimately, if the bond market becomes highly illiquid, it can cease to provide adequate pricing. When, a decade ago Australia experienced such a phenomenon, the futures market became the locus of price discovery. In other words, under such conditions, liquidity can shift from the physical market to the futures market, provided the latter is a well-functioning market.

Figure 5.1.3



It follows from the above that a high private debt/GDP ratio is further confirmation of the maturity of a debt market. A good example of this is the USA, which has a public debt/GDP ratio of 54.6%, the highest among the countries investigated here, and an even higher private debt/GDP ratio of 115.3%. This demonstrates that the US private sector deems the debt market to function well as an alternative source of funding to the traditional sources of bank loans and equity issuance. Indeed, debt issuance can be preferred to equity issuance in mature financial markets,

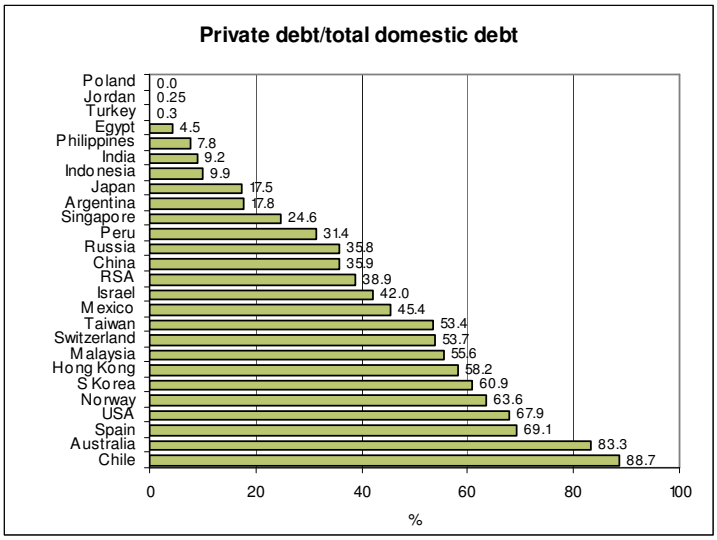
[1] It should be noted that this is a very long-term phenomenon, i.e. 20 to 40 years.

as the former does not, like the latter, result in a “sale” of a stake in the ownership of a business. Debt can be repaid without diluting business ownership.

As a reflection of the “access” dimension of bond markets, respondents were required to provide the ratio of domestic bonds to total bonds outstanding for the country as a whole (Question 1.3) and the ratio of private sector bonds to total domestic bonds outstanding (Question 1.4). In the first instance, a high propensity of debt issuance in the domestic market rather than in the international market suggests that domestic markets are sufficiently well developed not to force issuers to seek funding offshore. At times, however, funding has to be sourced domestically because foreign investors have no interest in a particular country, investment risk is elevated or there are restrictive policies in this regard. Alternatively, issuers in small countries are forced to seek funding offshore to overcome the limited development of the local market (as mentioned earlier, small economies tend to have smaller financial markets). Similarly, in the second instance, a high propensity for the private sector to source funding in the domestic market is suggestive of a well developed and functioning bond market, as well as of sturdy creditor protection and legal infrastructure.

According to the World Bank study, corporations in high-income OECD countries account for the bulk (as much as 90% at the time of the study) of the corporate bond issues globally, while corporate bond issues in developing countries are small by global standards.

Figure 5.1.4



As a reflection of the “efficiency” dimension of the bond market, respondents were asked to provide the turnover ratio for public sector debt and private sector debt respectively (Question 1.5). The turnover ratio was defined in the survey as the nominal value of turnover in bonds divided by the nominal value of outstanding debt stock. Liquidity is an important aspect of well functioning markets as it provides investors with the ability to diversify risk. However, it should be noted that the measure of liquidity used in this instance is not completely reflective of overall liquidity, as it does not account for transactions that occur over the counter in informal markets and are therefore not recorded.

Using data obtained from the World Federation of Exchanges, the turnover ratios for public sector debt as recorded by various exchanges were calculated. These are reflected in Figure 5.1.5.

As a reflection of the "stability" dimension of the debt market, respondents were required to provide the ratio of short-term debt securities to total domestic debt in issuance (Question 1.6). In the survey, short-term securities were defined as securities with a maturity of up to one year. In effect, the ratio is representative of "maturity" of the market, which in turn is but one of the indicators of stability, the others being volatility, skewness and the correlation of bond returns to a benchmark. However, exchanges could not be expected to provide data in this regard.

Figure 5.1.5

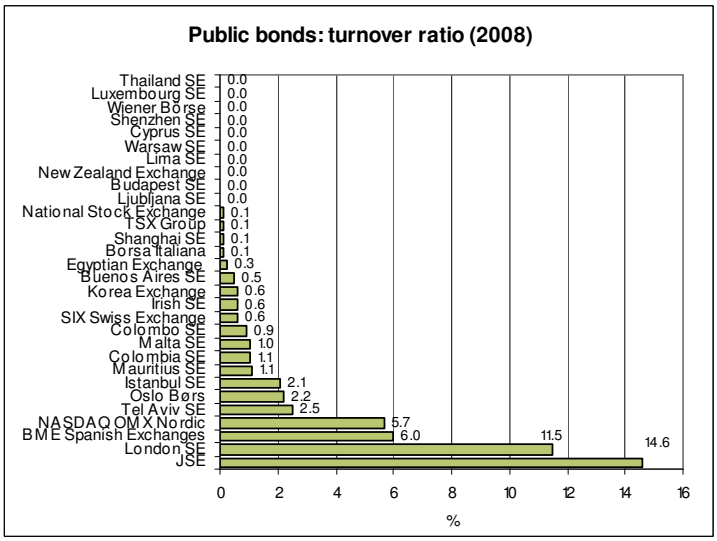
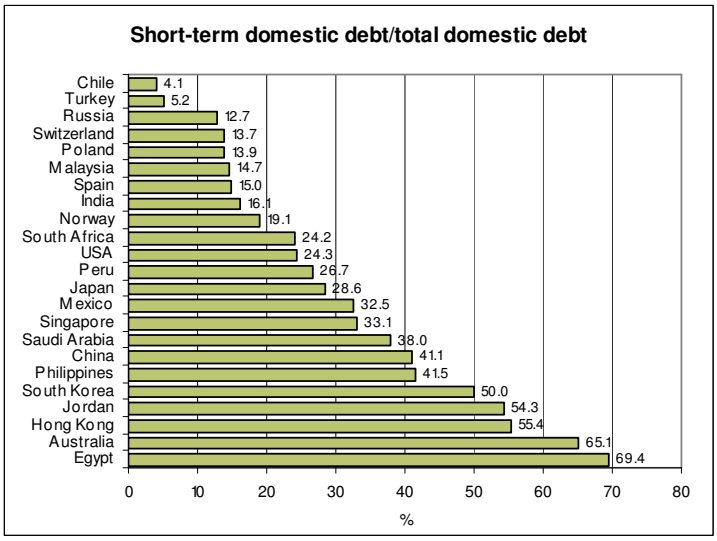


Figure 5.1.6



In shallower markets, short-term debt tends to represent the bulk of total debt issuance, which can elevate instability in the market. When investors are risk averse or risk conditions are high, the market for short-term issuance tends to be more active than that of medium- and long-term debt and the cost of capital tends to be higher. This enables issuers to obtain funding, even if at punitive rates, while protecting investors by reducing the risk horizon. The instability arises from the ease with which investors can withdraw from the market. The findings in this regard are reflected in Figure 5.1.6.

Table 5.1.2

Bond Market Composite Indicators and Ranking (2004)						
Country	**Exchange/s surveyed**	**Overall**	**Size**	**Efficiency**	**Access**	**Stability**
DNK	-	6.67	7.92	8.33	6.46	3.96
JPN	Osaka Securities Exchange & Tokyo SE Group	6.44	8.76	5.99	5.98	5.04
USA	CBOE, CME, NYSE Euronext, ISE and ICE	6.32	7.54	6.06	6.43	5.26
ISL	Tel-Aviv SE	6.23	9.92	5.00	5.00	5.00
SWE	NASDAQ OMX	6.13	6.07	9.30	5.52	3.65
NLD	-	5.86	8.08	6.13	4.84	4.38
ITA	-	5.83	7.49	6.10	5.39	4.34
AUT	Wiener Börse AG	5.78	6.06	6.00	4.94	6.12
BEL	-	5.75	7.59	6.13	5.33	3.93
FRA	-	5.65	6.54	6.13	5.33	4.59
DEU	Deutsche Börse Group	5.62	6.13	6.16	5.12	5.07
GRC	Athens Exchange	5.59	6.89	6.04	4.43	5.00
ESP	BME Spanish Exchanges	5.52	5.87	6.01	5.44	4.76
KOR	Korea Exchange	5.44	5.29	5.33	6.15	5.00
PRT	-	5.36	6.02	6.10	5.28	4.05
CHE	SIX Swiss Exchange	5.34	5.19	5.15	6.58	4.42
CAN	TMX Group	5.33	5.87	6.06	5.00	4.38
COL	Bolsa de Valores de Colombia	5.12	4.36	7.41	4.03	4.70
POL	Warsaw SE	5.05	4.49	5.87	3.76	6.09
SGP	Singapore SE	5.01	5.32	5.40	5.10	4.22
SVK	-	5.01	4.32	5.70	5.00	5.00
FIN	-	5.00	5.57	6.10	4.75	3.60
GBR	London SE Group	5.00	5.37	7.24	3.82	3.55
IRL	Irish SE	4.99	6.40	6.31	4.36	2.91
MYS	Bursa Malaysia	4.99	5.86	4.13	5.70	4.28
NOR	Oslo Børs	4.96	4.71	5.88	5.20	4.07
AUS	Australian SE	4.94	5.10	5.92	5.09	3.66
CZE	-	4.92	5.18	4.51	5.00	5.00
THA	SE of Thailand	4.87	4.45	4.51	5.53	5.00
HKG	Hong Kong Exchanges	4.81	4.33	4.71	5.19	5.00
CHL	Bolsa de Comercio de Santiago	4.78	4.68	4.08	5.55	4.82
ZAF	JSE Limited	4.55	4.67	3.77	4.22	5.53
IND	Bombay SE & National SE of India	4.54	4.35	4.53	4.26	5.00
ARG	Bolsa de Comercio de Buenos Aires	4.47	4.35	4.99	3.54	5.00
RUS	Moscow Interbank Currency Exchange	4.43	3.48	4.69	5.00	4.55
NZL	New Zealand Exchange	4.36	4.30	5.00	5.00	3.15
HUN	-	4.26	5.01	3.12	3.52	5.38
IDN	Indonesia SE	4.11	4.10	3.47	4.61	4.26
MEX	Bolsa Mexicana de Valores	3.97	4.17	4.14	3.09	4.47
TUR	Istanbul SE	3.95	5.09	4.16	3.20	3.35
PAK	-	3.85	4.39	1.94	5.00	4.07
BRA	BM&F Bovespa	3.55	5.16	3.12	3.10	2.83
PHL	Philippine SE	3.53	4.57	2.79	2.18	4.57
PER	Bolsa de Valores de Lima	3.49	3.66	2.55	4.49	3.27

To create the composite indicators, a number of sub-indicators are standardized by subtracting the median of the distribution and scaling these by the standard deviation of the distribution. The standardized scores are then averaged to create the composite indicator for each dimension.

The information in this section provides the context within which the bond market data collected throughout the rest of the survey can be interpreted. Given that a thorough investigation of bond market indicators could not be conducted here, the World Bank's composite indicators of bond market development are also provided for contextual background, even though these were compiled using 2004 data (Table 5.1.2).

5.2 Section 2

Questions in Section 2 of the survey pertain to the **primary bond market**. There are a total of 5 questions in this section. The response rates obtained per question are reflected in Table 5.2.1.

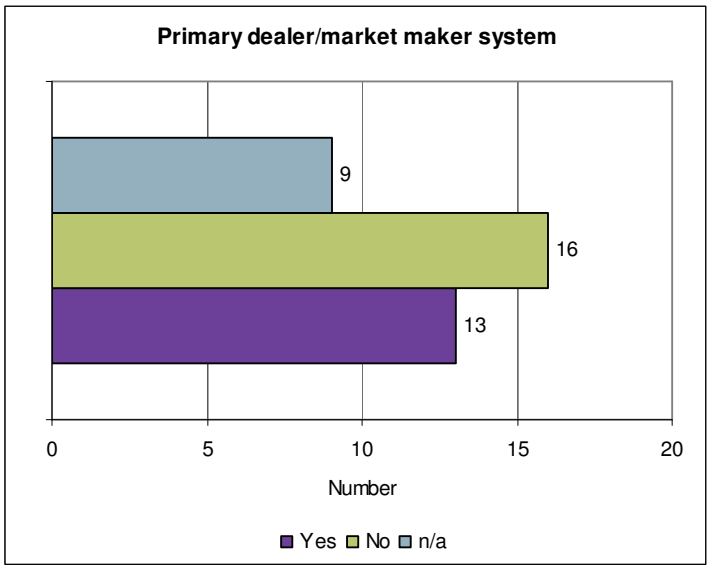
Table 5.2.1

Question number	Response rate (%)
2.1	100
2.2	100
2.3	100
2.4	97
2.5	100

Question 2.1

The responses are summarised in Figure 5.2.1.

Figure 5.2.1



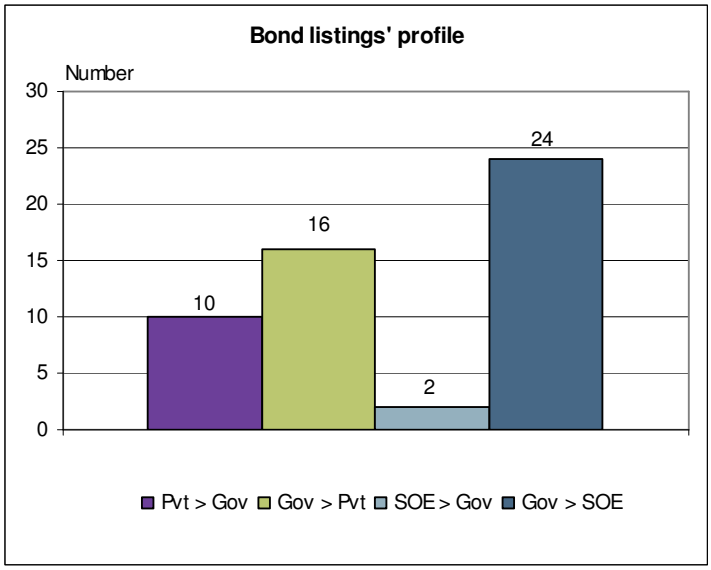
Of the 29 relevant responses, 13 indicated that there is a primary dealer (PD)/market maker system in the bond market; 7 respondents specified that the PD system exists for government bonds only, which aids in the take-up of such paper during auctions. Market makers also stand ready to quote two-way prices in bonds and their existence therefore tends to enhance price discovery and liquidity in secondary bond markets. Among the 13 exchanges that acknowledged having a PD/market maker system in place are 3 exchanges that are in the top 12 as far as the value of bond turnover recorded in 2008 is concerned. These are the Johannesburg SE, the Colombia SE and the Oslo Børs.

The decision of whether to have PDs or not is not as straightforward as it might seem. There are many countries that choose not to appoint PDs for a variety of reasons. PDs have obligations bestowed on them but this is usually in return for privileges, such as liquidity support from the central bank, access to non-competitive bidding, exclusive or restricted access to auctions, the ability to short-sell bonds (Mohanty, 2002). Some of these privileges can have other, negative albeit unintended consequences. In addition, the creation of a "privileged" group creates an unequal playing field.

Question 2.2

Of the 29 relevant responses, 16 indicated that government bond listings exceeded private bond listings (in nominal value terms) in 2008. The importance of government bonds is outlined in Section 1. In 10 out of the 29 cases, private bond listings were greater than government listings. Listings by parastatals (state owned enterprises or SOEs) were less developed than both the government and private sector bond markets across the majority of respondents in 2008, barring for two instances, where SOE issuance exceeded government issuance (on the Saudi Stock Exchange and the Bolsa Mexicana de Valores). In 4 instances, SOE issuance also exceeded private sector bond issuance.

Figure 5.2.2



Question 2.3

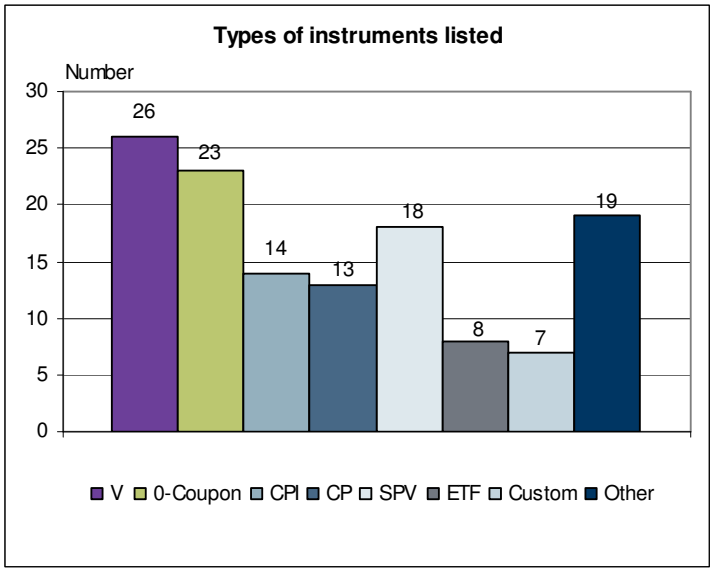
The range of instruments on offer in a market can reveal important characteristics of that market. According to Mohanty (2002), these include market preference, cost to government, monetary policy objectives. Market preference is shaped by the issuer and investor profiles. Thus, to some extent, the type of instruments on offer might be an indication of market sophistication[2]. Respondents were asked to indicate what types of instruments were listed on their exchanges as at the end of 2008. The options provided were: vanilla bonds; zero coupon bonds; inflation-linked bonds (CPI); commercial paper (CP); asset backed securitization (SPV); bond exchange-traded funds (ETFs); and customized instruments. Respondents were also asked to indicate whether other types of instruments are listed on their exchanges. Some of the "other" types of

[2] It should be noted that a wide diversity of instruments is generally not conducive to creating and maintaining liquid markets.

instruments listed include: floating rate notes (FRNs); covered bonds; hybrid (convertible) bonds; sukuks.

The most basic type of bond instrument is the vanilla instrument and 26 out of the 29 exchanges that list bonds indicated that they had vanilla bond listings by the end of 2008. Zero-coupon bonds are also quite prevalent among the survey respondents, as are asset-backed securitizations and inflation-linked bonds. Zero-coupon bonds temporarily reduce government borrowing costs; this could account for their popularity. Commercial paper issues represent a shorter type of debt funding and their levels can therefore fluctuate depending on market conditions. For instance, during times of heightened risk aversion or interest rate uncertainty, CP issuance tends to be heightened. It follows that in 2008, the year under investigation, a heightened level of CP issuance may have been recorded due to the global financial crisis.

Figure 5.2.3



Bond ETFs and customised instruments are generally prevalent in markets where a relatively sophisticated debt market is present. It follows that only 8 out of the 29 respondents listed bond ETFs on their exchanges as at the end of 2008. Surprisingly, however, among the 8 there are 3 exchanges that operate in markets that are far down in the relative overall rankings of the World Bank (see Table 5.1.2). These are the Hong Kong Exchanges and Clearing (ranked 30), the Johannesburg SE (ranked 32) and the Bolsa Mexicana de Valores (ranked 39). Three are highly ranked (the Tokyo Exchange Group, ranked 2; the Tel-Aviv Exchange, ranked 4; and the SIX Swiss Exchange, ranked 16 overall). Bursa Malaysia and the Singapore Exchange are ranked 25 and 20 respectively.

As far as “other” instrument types are concerned, floating rate notes (FRNs) are listed on 11 of the exchanges surveyed, while hybrids/convertible bonds are to be found on 8 exchanges. Only 4 exchanges list covered bonds and 3 list sukuks. FRNs are instruments that tend to be popular among investors during times of uncertainty regarding interest rate movements, as they effectively transfer the bond market risk to the issuer.

A list outlining the characteristics of a variety of bond securities is provided in Annexure 3.

Questions 2.4 and 2.5

In Question 2.4, respondents were asked to indicate whether issuers are required to obtain a credit rating for their bond issues.

The responses are indicated in Figure 5.2.4. Figure 5.2.5 shows in how many instances the requirement is stipulated by law and in how many by the exchange rules (Question 2.5). While 12 out of the 29 respondents indicated that a credit rating is required, it should be noted that three respondents, the Indonesian, the Egyptian and the Shenzhen exchanges indicated that the requirement is stipulated both by law and by exchange rules. As per the rankings in Table 5.1.2, the requirement is mostly prevalent in less developed bond markets.

Figure 5.2.4

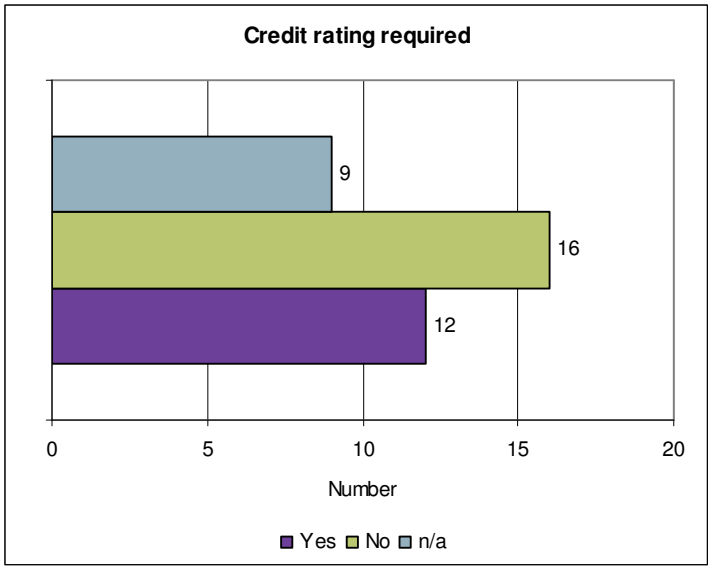
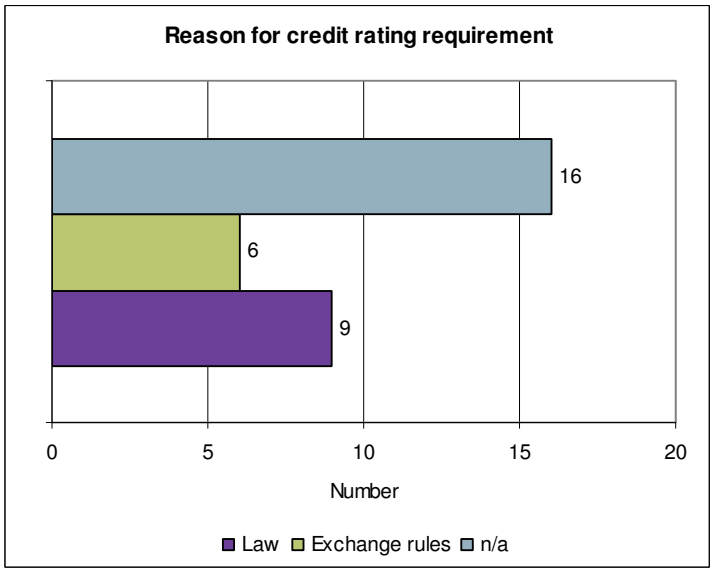


Figure 5.2.5



5.3 Section 3

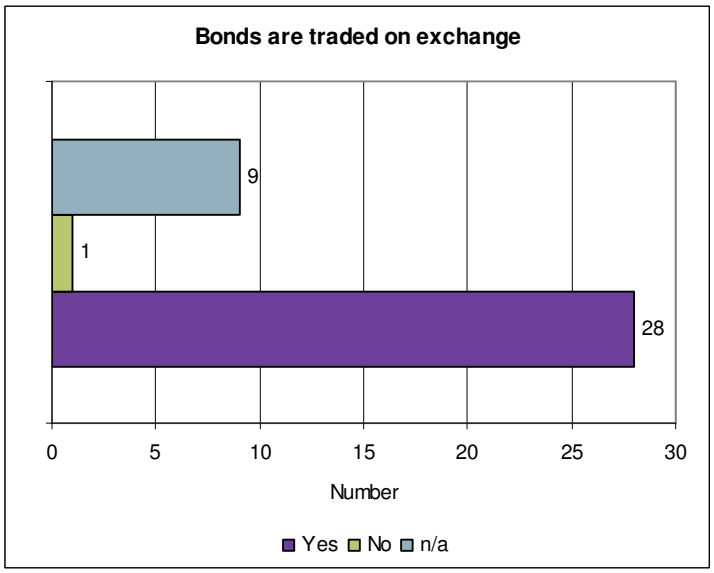
Questions in Section 3 of the survey pertain to the **secondary bond market (trading)**. There are a total of 12 questions in this section. The response rates obtained per question are reflected in Table 5.3.1.

Table 5.3.1

Question number	Response rate (%)
3.1	100
3.2	93
3.3	100
3.4	100
3.5	93
3.6	83
3.7	83
3.8	87
3.9	45
3.10	62
3.11	48
3.12	82

Question 3.1

Figure 5.3.1



Respondents were asked to indicate whether bonds are traded on exchange. As evident from a subsequent question (3.4), on exchange is intended to include trading that technically happens over the counter (OTC) but is subsequently reported to an exchange as a requirement by law/rule. The majority of the exchanges surveyed indicated that bonds are traded on exchange. In Singapore, however, bonds are traded OTC (transacted by telephone) and trades are not reported to the exchange.

In effect, however, there are variations to the meaning of “on exchange”. Closer scrutiny to the information provided highlights that there are three exchanges which effectively have a report-only mechanism for trades that are brokered outside of the exchange environment, either for all

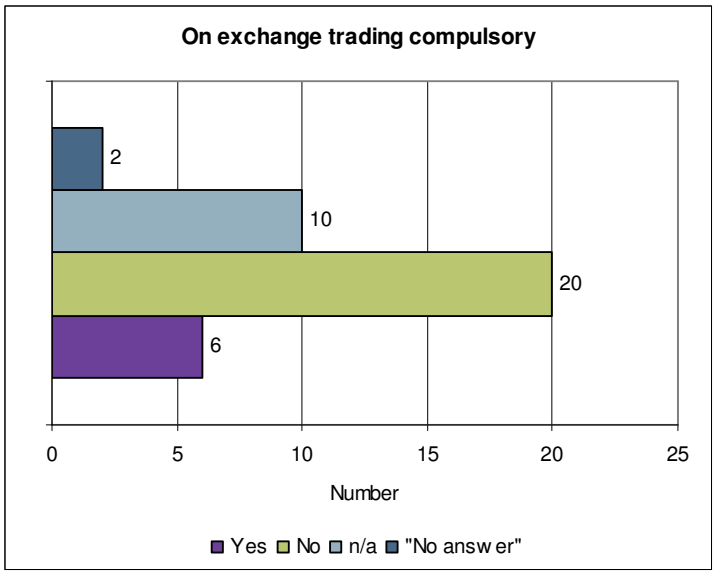
or some bond trades; these are the BME Spanish Exchanges, the Johannesburg SE and the SIX Swiss Exchange. In Spain, public debt trading is supervised by the Bank of Spain and occurs over the telephone. Corporate debt trading also occurs over the telephone via AIAF (Asociación de Intermediarios de Activos Financieros). However, bonds can also be traded simultaneously on the exchanges that offer a specific regime for this purpose (electronic debt market, SIBE, Sistema de Interconexión Bursátil Español). In South Africa, the Johannesburg SE acquired the Bond Exchange of South Africa (BESA) in June 2009 and integrated the fixed income market of BESA into its own. Although the Johannesburg SE offers both central order book trading and report-only facilities, all trades are executed OTC and only reported to the exchange. In the market operated by SIX Swiss Exchange, it is compulsory for trades of certain sizes to be executed on exchange in order to ensure price transparency. However, off-exchange trades have to be reported to the exchange for publishing before the opening of the market the following day.

Prior to July 2009, the Saudi SE only provided a report-only facility but it subsequently introduced an electronic trading system so that all trades are now executed electronically. On the Egypt SE, primary dealers are allowed to trade government bonds by telephone but have to subsequently report these trades to the exchange via its system, while corporate bonds are traded on the central order book of the exchange. In many other instances, it is only compulsory for certain trades (specified according to product traded or size of trade) to be executed on exchange, or for certain market participants to execute trades on exchange.

Question 3.2

On exchange trading of bonds is not predominant due to legislative requirements. This would suggest that the infrastructure offered by exchanges, be it regulatory, technical or otherwise is supportive of on exchange bond trading. Indeed, a sound, robust and safe market infrastructure, which ought to include payment and settlement systems, a regulatory and supervisory framework as well as market monitoring/surveillance, is a prerequisite for well functioning bond markets.

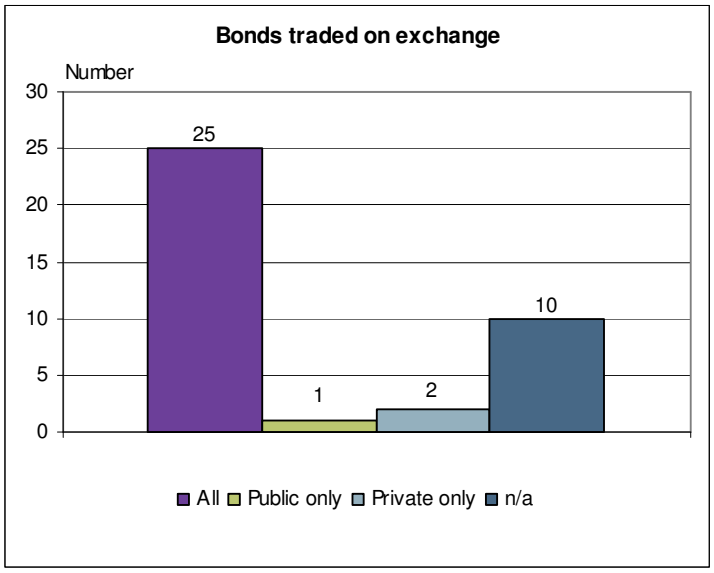
Figure 5.3.2



Question 3.3

On exchange bond trading is widespread across a spectrum of fixed income instruments. In most instances, all types of bonds that are listed on an exchange can be traded on exchange, as can be seen from Figure 5.3.3.

Figure 5.3.3

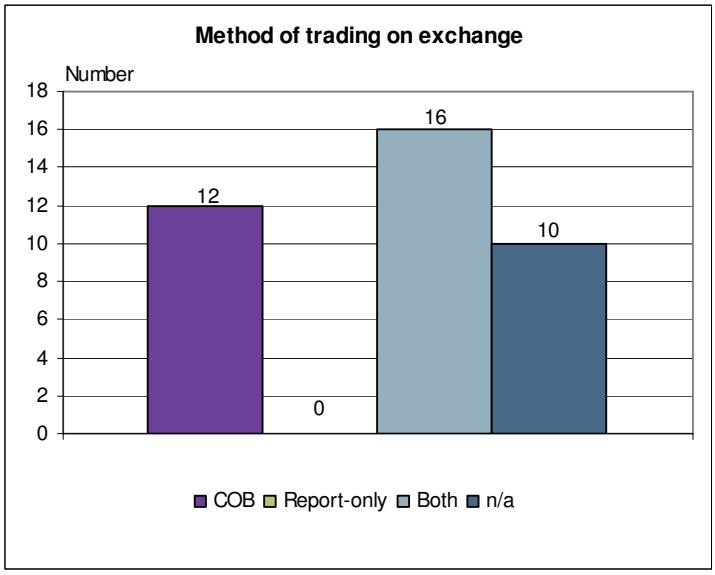


Question 3.4

Trading arrangements, synonymous with the degree of market transparency provided, influence both price discovery and market liquidity (Mohanty, 2002). By their very nature, some trading arrangements are conducive to greater information flow and therefore competition among market participants. According to the Committee on the Global Financial System of the central banks of the G10 countries (BIS, 2001), electronic and centralised order books enable market participants to trade directly and multilaterally without the need for other intermediation. An algorithm matches bids and offers according to predetermined priority rules so that price formation is order driven (prices follow orders). In contrast, decentralised markets, also known as OTC markets, rely largely on bilateral interaction between dealers or between dealers and customers and are quote driven (orders follow prices). In these systems, either indicative or firm bid and offer quotes are posted by dealers and the price of the trade is determined when a quote is hit. The prices for large orders tend to be negotiated separately. Often, mention is made of electronic dealer systems. In effect, this means that requests for quotes are submitted electronically and the trades might be ultimately executed electronically, but this is after the bilateral negotiations have taken place over the telephone.

While it is widely believed that there is an aversion to trading of fixed income instruments on central order book, at least 12 exchanges indicate that this is how bonds are traded on exchange, while the remaining 16 indicate that both methods of trading bonds, central order book (COB) and report-only, are available. None of the exchanges surveyed reported exclusively offering the report-only facility for bond trading.

Figure 5.3.4



Which platform sees the bulk of trading of a particular asset class depends on the degree of standardisation of the underlying instruments, the size and sophistication of the participants in the market and a host of other institutional, regulatory and historical factors. When it comes to bonds, there can be little standardisation of instruments; the size of trades tends to be large and there tends to be a small, concentrated number of participants with large interests, all factors that discourage the trading of bonds on central order book platforms. Hence the belief that there is an aversion to trading bonds on COB.

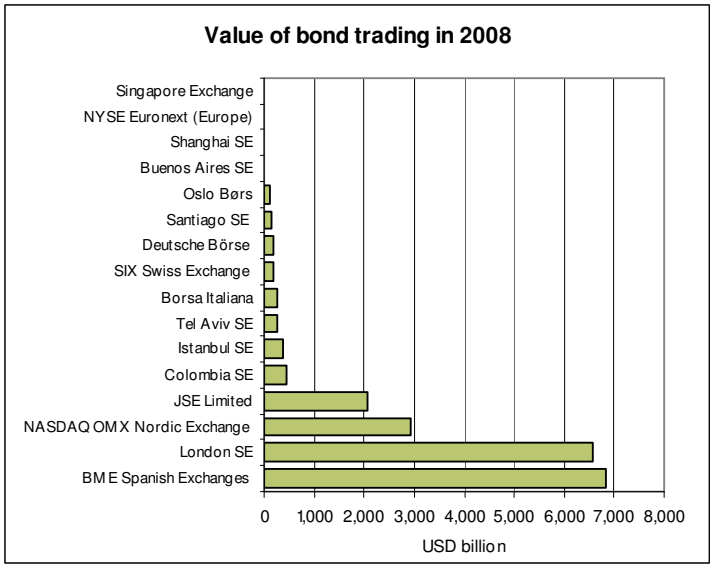
Generally, trading appears to shift from one platform to another as the financial system evolves, as participants' needs change and advances in information technology occur. It may therefore be difficult to draw any general conclusions on the appropriate configuration of trading platforms for bonds.

Nonetheless, an OECD, World Bank and IMF forum held in April 2008 concluded that the shift to electronic trading platforms in mature bond markets has contributed to improved liquidity and price transparency, albeit with some caveats. For instance, electronic platforms are said to have a lower adaptability to extreme volatile conditions.

Question 3.5

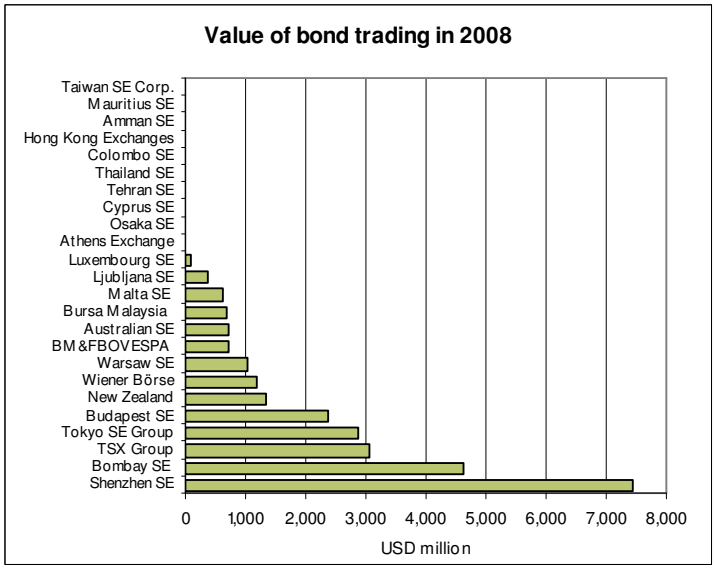
Respondents were asked to provide the value of turnover in bonds recorded in 2008, in USD million. However, some respondents either did not provide this information or it appeared incorrect. Consequently, the data were obtained from the World Federation of Exchanges.

Figure 5.3.5



The 16 exchanges that recorded a turnover of over $10 billion are reflected in Figure 5.3.5. The remaining exchanges are reflected in Figure 5.3.6.

Figure 5.3.6

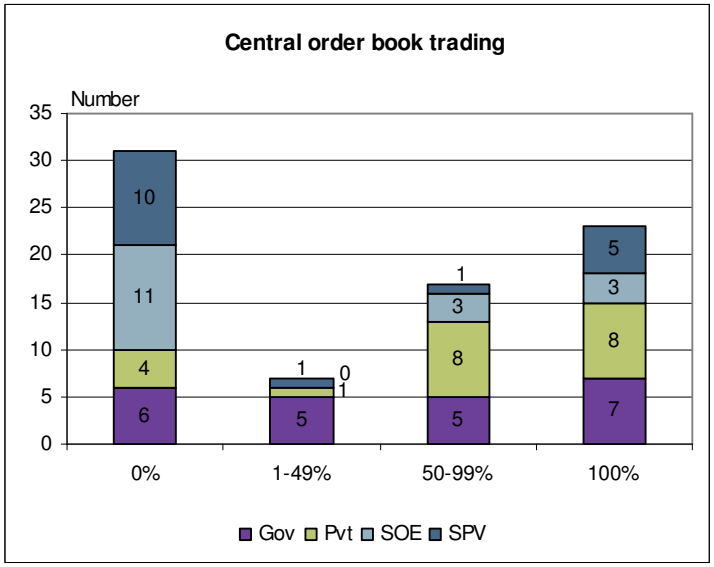


Questions 3.6 and 3.7

The responses to these two questions can be reviewed jointly.

Given that at least 16 exchanges offer both central order book and report-only facilities for the trading of bonds, it is pertinent to examine which of the two facilities is used the most when trading bonds and which of the two facilities is preferred for the trading of particular bonds.

Figure 5.3.7



Question 3.6 required exchanges to indicate the proportion of bonds traded on central order book, per type of bond: government bonds, private sector bonds, parastatal bonds, securitization instruments. Question 3.7, in turn, required exchanges to indicate the proportion of bonds traded via the report-only facility, also per type of bond. To collate the information collected from the respondents, the percentages of trading that occurs for each of the various types of bonds, via COB and via the report-only facility respectively, were sub-divided into the following ranges: 0% traded; 1% to 49% traded; 50% to 99% traded; and 100% traded.

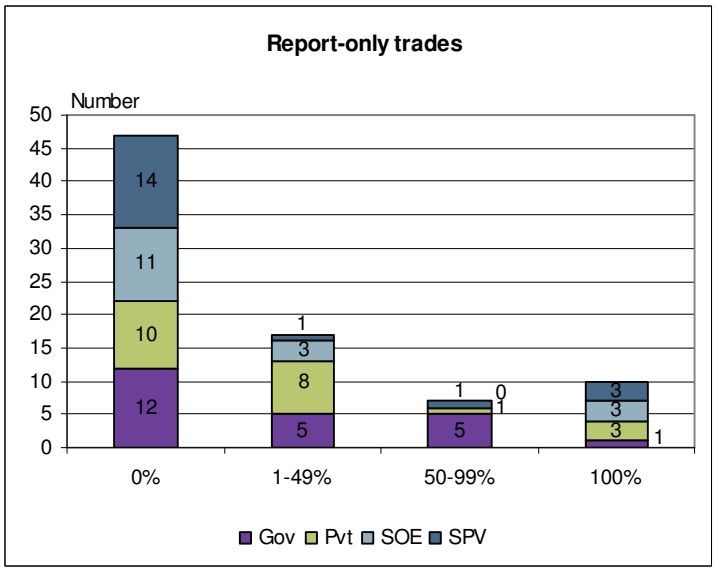
In the instance of government bonds, on 7 exchanges 100% of trading occurs via the COB, on 5 exchanges 50% to 99% of trading occurs via the COB and on 5 exchanges 1% to 49% of trading occurs via the COB. Thus, in total, 12 exchanges record more than half of all government bond trades and, in some instances, all such trades on the COB facility. In contrast, only 6 exchanges record 50% to 100% of bond trades via the report-only facility.

In the instance of private sector bonds, 16 exchanges record 50% to 100% of bond trades via the COB, and 4 record 50% to 100% via the report-only facility. Parastatal bonds and securitization instruments trading, either via COB or report-only is less prevalent on exchanges compared to government and private sector bonds.

Of the respondents to the survey, 6 indicated that they record 50% to 100% of parastatal trades on COB and 3 that they record 100% via the report-only facility. In the instance of securitization instruments, 6 exchanges indicated that they record 50% to 100% of trades on COB and 4 that they record 50% to 100% of trades via the report-only facility.

Thus, when it comes to trading government and private sector bonds, the predominant mechanism used across the exchanges surveyed is the COB.

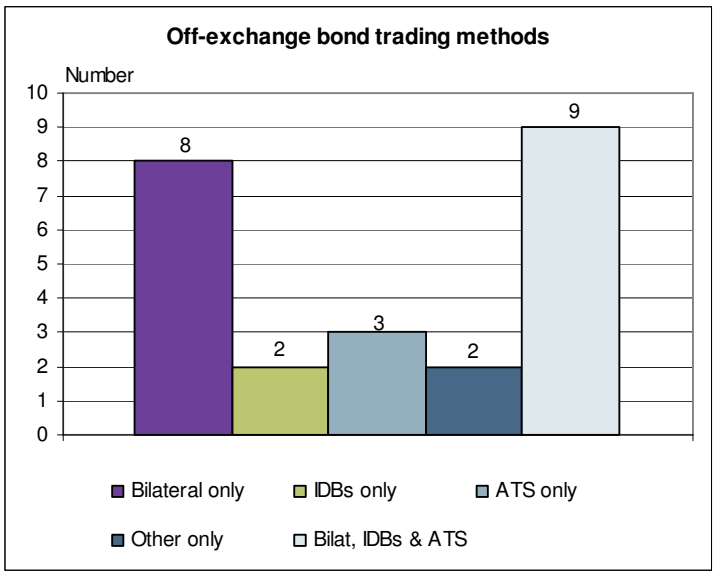
Figure 5.3.8



Question 3.8

When bond trades are not concluded on exchange, they are concluded via other mechanisms. In some instances, trades are subsequently reported to an exchange. In some markets, inter-dealer brokers (IDBs) play a significant role in executing bond trades; in others, traders make use of automated trading systems (ATSs) offered by third parties which are not exchanges. In other cases still, bilateral negotiations occur telephonically between bond traders. Alternatively, a mix of these and other trading mechanisms is used.

Figure 5.3.9



According to the survey respondents, bilateral negotiations are still a very popular method of trading bonds across markets where on exchange trading of bonds is not prevalent. In many markets, however, a mix of methods for trading bonds (that is, bilateral negotiations, IDBs and ATSs provided by third parties) is utilised.

Question 3.9

Question 3.9 was aimed at understanding the extent of the involvement of foreigners in domestic bond markets. The extent of non-resident activity in domestic bond markets is representative of the openness, efficiency and liquidity of such markets. Foreign investors are said to enhance liquidity by increasing the total investor base and adding market sophistication (Mohanty, 2002). According to Peiris (2010) foreign investors are more likely to trade bonds rather than to adopt buy-and-hold strategies and to therefore contribute towards a more liquid market. At the same time, there are instances when foreign participation can prove less beneficial, for instance during times of global contagion, and can contribute towards greater volatility in bond yields. During the global financial crisis of 2008, the sudden withdrawal by foreign investors from emerging market bond markets resulted in a spike in bond yields Therefore, the need to deepen domestic bond markets has to be balanced against the risks that accompany the broadening of the investor base. Notwithstanding this, it is said that in the long run foreign participation in local bond markets can be a stabilizing force (Prasad and Rajan, 2008 in Peiris, 2010). Foreign participation may result in strong corporate governance and the required institutional reforms that are necessary to draw such participation. However, the market structure should prevent excessive concentration among any one type of investor (foreign or otherwise) and should prescribe prudential limits on individual exposures.

Unfortunately, very few respondents (the response rate was 45%, see Table 5.3.1) were able to provide the proportion of bond trading that is attributable to non-residents in their domestic markets; therefore no conclusions can be drawn from the information collected.

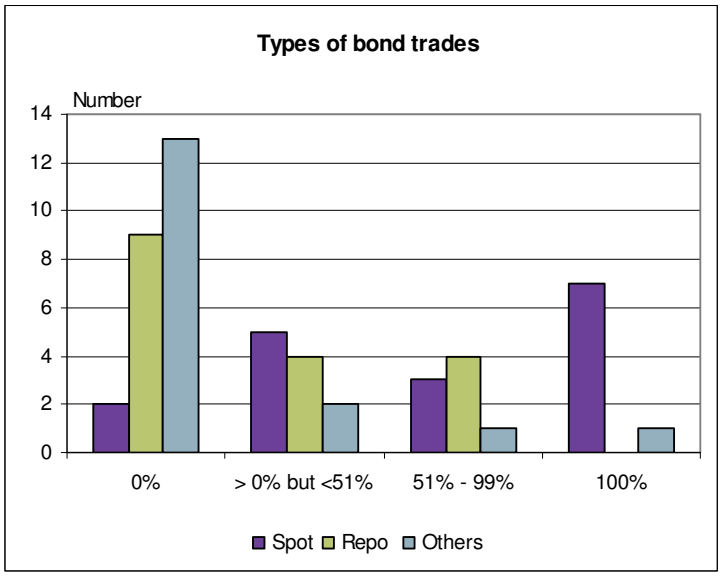
Question 3.10

In Question 3.10 respondents were asked to indicate the proportion of 2008 bond turnover that comprised spot/cash trades, repo trades (buy/sell-backs) and other trades respectively. Repo trades are ideally suited to develop secondary markets, according to Mohanty (2002), because they are not dependent on liquid bond markets. In effect, repos allow market participants to borrow against their securities portfolio. The International Capital Market Association (ICMA) explains that in a typical repo transaction, a dealer buys a bond on the cash market but funds the purchase thereof by selling the very same asset in the repo market, which means that he agrees to repurchase that same bond and return the money thus borrowed at a later stage. The bond thus serves as collateral in the transaction and results in a lower cost of funding. At the time of the sale of the bond by the dealer, the future selling price and date are determined. As a result, a fall (rise) in the value of the bond during the term of the repo will be a loss (profit) to the seller. The buyer in the repo transaction can, in turn, sell the same bond in the cash market or in the repo market. As such, liquidity is temporarily enhanced. Well developed bond markets tend to have well developed repo markets. Repo transactions enable dealers to finance long positions and cover short positions, allowing them to respond to customers' needs quickly.

The response rate to this question was also not very high (62%). Nonetheless, the responses are summarized in Figure 5.3.10. Only 4 exchanges reported that 51% to 100% of trades recorded in 2008 were repo trades; similarly, only 4 exchanges reported that 1% to 50% of trades recorded were repo trades. Thus, in total, of the exchanges surveyed, 8 had a repo market in 2008. At least 9 exchanges reported not having a repo market in 2008 and thus recording 0% repo trades. Among these were the following exchanges: Amman SE, Cyprus SE and Hong Kong Exchanges, all of which recorded relatively low turnover volumes in 2008. In contrast, the SIX Swiss Exchange, which had among the highest turnover in bonds in 2008

(ranked 9th), the Tel-Aviv Exchange (ranked 7th) and the Oslo Børs (ranked 12th) also recorded 0% repo trades in 2008. The Istanbul SE, the Johannesburg SE, the Shanghai SE and the Moscow Interbank Currency Exchange have very well developed repo markets, which comprise more than half of all bond trades recorded in 2008. The first 3 of these all reported relatively large bond turnover volumes in 2008. Curiously, the Shenzhen Exchange reports 0% repo trades in 2008, yet recorded the 17th highest turnover in bonds in 2008, which is because there is, after all, a repo bond market in China. The repo market is indeed to be found on the Shanghai Exchange, as highlighted earlier. Outright repos were introduced in 2004 and by the end of 2008 accounted for 83% of all bond trading on the exchange.

Figure 5.3.10



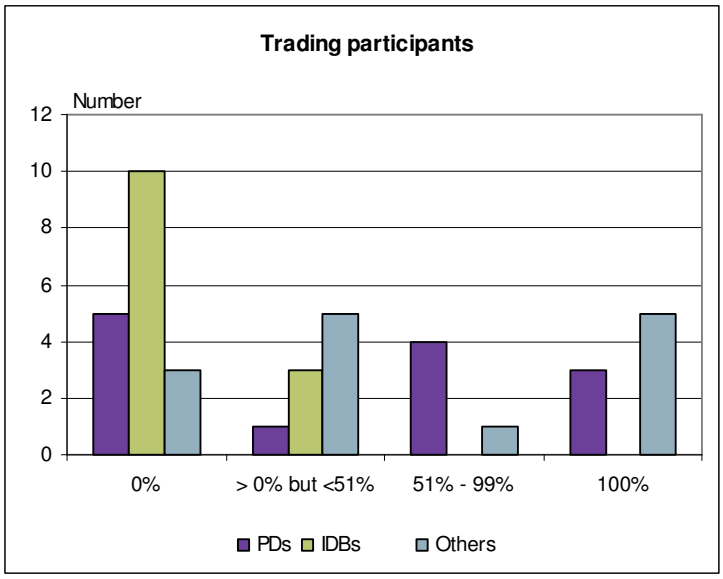
On 7 exchanges of those surveyed, spot trades comprised 100% of all bond trades recorded in 2008. On 3 exchanges, spot trades comprised more than half of bond trades recorded.

Question 3.11

Respondents were asked to indicate which types of members/traders are most active on their exchanges in respect of bond trading. Seven exchanges indicated that primary dealers (PDs) account for 51% to 100% of bond trading, while 6 exchanges indicated that other types of members/traders account for more than half of the bond trading that is recorded by them. As already highlighted in Section 2, a PD system is an important characteristic of a bond market. PDs contribute towards price discovery and liquidity, while at the same time guaranteeing take-up of issuance.

In contrast, IDBs do not appear to be very active traders of bonds across the exchanges surveyed. However, since the response rate to this question was low (48%) it is impossible to draw absolute conclusions from this information.

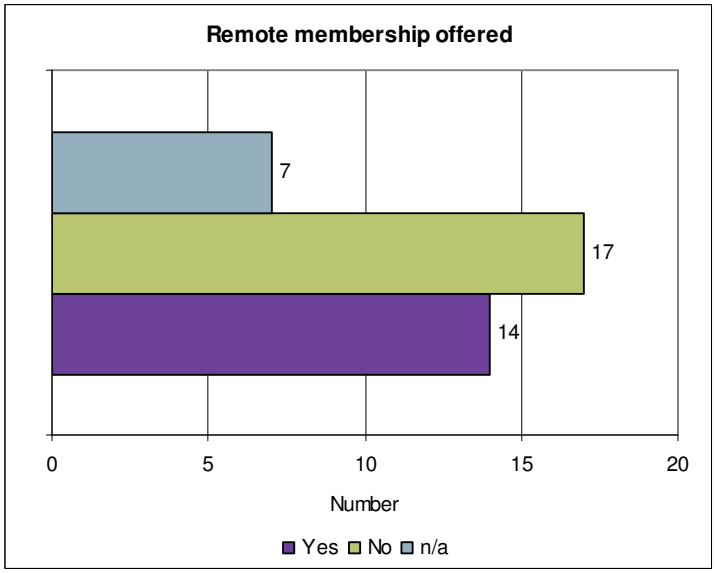
Figure 5.3.11



Question 3.12

Respondents were asked to indicate whether their exchanges offer remote membership. The responses received are collated in Figure 5.3.12.

Figure 5.3.12



Remote membership is only offered by 14 (37%) of the exchanges surveyed; 2 of these are derivatives exchanges (CME and CBOE). Remote membership refers to the ability of an entity to be eligible for trading as a member of an exchange without being domiciled in the relevant country. The accessibility of an exchange via remote membership can be conducive to stronger turnover volumes. The following exchanges offer remote membership and recorded relatively high turnover volumes in 2008: BME Spanish Exchanges; Tel-Aviv SE; SIX Swiss Exchange; Oslo Börs; Shanghai SE. There are, however, a number of exchanges that offer remote

membership but do not record high bond turnover volumes. These include the Cyprus SE, the Luxembourg SE, the Warsaw SE, and the Tokyo SE.

5.4 Section 4

Questions in Section 4 of the survey pertain to **fixed income derivatives instruments**. There are a total of two questions in this section. The response rates for these questions are set out in table 5.4.1.

Table 5 4.1

Question number	Response rate (%)
4.1	100
4.2	100

Questions 4.1 and 4.2

Respondents were requested to indicate whether they offer short (STIR) and long term (LTIR) interest rate derivative products on their exchanges. Of the 32 relevant responses, 9 indicated that they offer STIRs (or at least one such product) and 14 LTIRs (or at least one such product).

The exchanges that offer interest rate derivative products are listed in Table 5.4.2.

Table 5.4.2

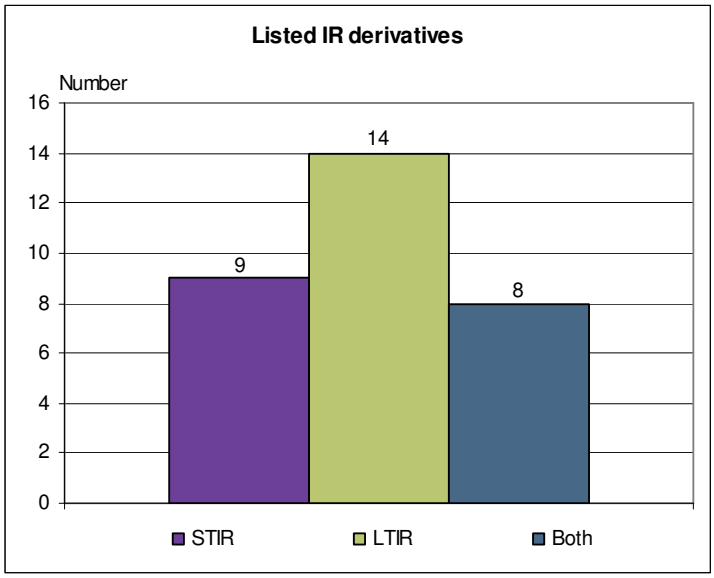
Exchange	IOMA*/IOCA member	STIR	LTIR
Australian Stock Exchange	✓	✓	✓
BME Spanish Exchanges			✓
Bolsa de Comercio de Buenos Aires	✓	✓	✓
Bolsa de Valores de Colombia		✓	✓
Bolsa de Comercio de Santiago	✓		✓
Bolsa Mexicana de Valores		✓	✓
Bursa Malaysia Berhad	✓		✓
CME Group	✓	✓	✓
CBOE	✓	✓	✓
Hong Kong Exchanges	✓		✓
Johannesburg SE	✓	✓	✓
Korea Exchange	✓	✓	✓
Moscow Interbank Currency Exchange		✓	
Singapore Exchange	✓		✓
Tokyo Stock Exchange	✓		✓
**International Options Market Association*			

In effect, based on information available from the International Options Market Association (IOMA), there are other exchanges that offer either STIR or LTIR or both, but these did not indicate this in the survey. For instance, such information was not provided by NYSE Liffe Euronext; NASDAQ OMX is a member of IOMA but did not participate in this survey; both the Hong Kong Exchanges and Bursa Malaysia appear to offer both STIR and LTIR products, but in this survey reported only offering LTIR products.

From the information provided in the survey, it would appear that the Australian SE is one of the few exchanges that provide an array of both STIR and LTIR products. Another such exchange is

the Bolsa Mexicana de Valores. Bursa Malaysia, the Chicago Board Options Exchange, the Johannesburg SE, the Tokyo SE and the Korea Exchange also offer a number of LTIR products. As can be seen from Table 5.4.2, these are all indeed members of IOMA. A range of products are provided: government bond futures and options; interest rate futures and options; bond index futures and options; interest rate swap futures and options.

Figure 5.4.1



Given the gaps in the information gleaned from the survey it is difficult to draw any steadfast conclusions regarding the extent of interest rate derivatives markets. Debt market and derivatives securities, however, are said to be complementary (Centre for Emerging Market Enterprises, 2008). Time and again, the literature on the topic highlights this factor and also the circular relationship between the two markets. Derivatives markets enhance liquidity in the secondary bond markets because, by their very nature, derivatives provide risk management tools and thus improve risk management practices. This encourages overall trading activity. According to Mohanty (2002), cash and futures markets are closely linked by flow of information and expectations, such that the overall liquidity effects of futures markets in government bond markets could be substantial. At the same time, a developed and well-functioning bond market, which provides reference rates, is a prerequisite for the development of interest rates derivatives.

G8 Finance Ministers also pointed out following a G8 meeting in 2007 that the development of derivatives markets has to be underpinned by appropriate infrastructure and regulatory frameworks. Bond markets that have reached an appropriate stage of development and liquidity should therefore strive to develop a derivatives market.

5.5 Section 5

Questions in Section 5 of the survey pertain to **post-trade services**: the clearing and settlement of bonds and the clearing of fixed income derivatives. The response rates, per question, are reflected in Table 5.5.1.

Table 5.5.1

Question number	Response rate (%)
5.1	100
5.2	97
5.3	100
5.4	100
5.5	93
5.6	100
5.7	93
5.8	97

Questions 5.1 and 5.2

All exchanges, barring those that do not operate a bond market, provided some insight into how bonds are settled in their market, as required by this question. The process of settlement involves the delivery of and payment for securities in a smooth, protected and synchronized manner. Problems in settlement can otherwise result in liquidity pressures and even credit losses for some participants. The ideal method of settlement is simultaneous, final and irrevocable delivery versus payment, more commonly referred to as DvP. A well-functioning settlement system goes hand in hand with a well-functioning national payment system in providing investor confidence to trade various securities.

Central Securities Depositories (CSDs) are central players in settlement systems. In most instances, CSDs oversee and effect electronic book-entry transfers of securities, unless the latter exist in physical certificate form, something no longer very common. As such, settlement can occur much faster and at a lower cost and risk than historically. CSDs enable members to hold book entry accounts and settle transactions between members on the basis of DvP, often in central bank funds but also in commercial bank funds (although funds can be transferred through internal accounts at the CSD as well). If market participants do not directly hold accounts with a CSD, they may hold their securities through a custodian and settlement is thus also done through the custodian. When trades are cleared by a central counterparty (CCP), clearing house novation takes place before transactions pass to the CSD for settlement. The CSD itself does not do the clearing of transactions, that is, it does not provide guarantees for the trades. However, often settlement and clearing services are offered by a single entity, which is either completely independent or completely/partly owned by an exchange.

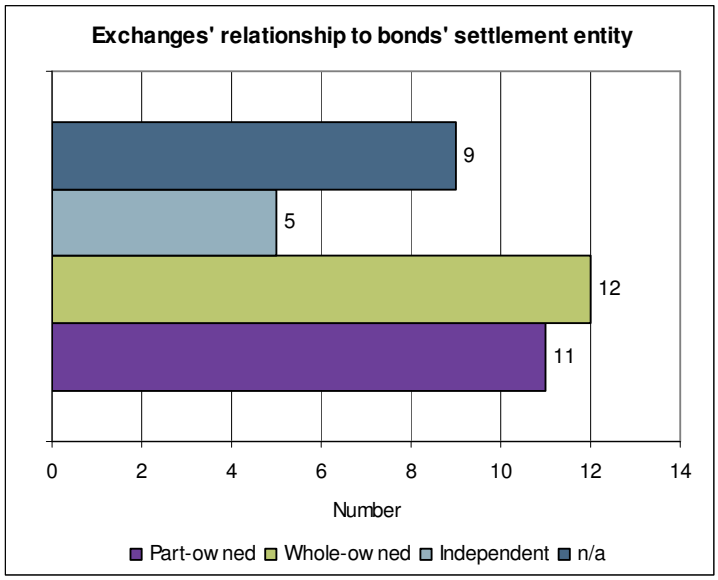
According to the Recommendations for Securities Settlement Systems (CPSS & IOSCO, 2001), rolling settlement should be adopted in all securities markets. Final settlement should take place no later than T+3 and on a DvP basis. The recommendations also encourage the dematerialization of securities and the use of securities lending and borrowing (e.g. repurchase agreements) to ensure settlement.

From the information provided in the survey it would appear that in most jurisdictions, spot bonds are settled either through a CSD or, in limited instances, the central bank (generally government bonds). Central Bank settlement occurs in Malaysia, Turkey, Indonesia (government bonds only) and Japan (government bonds only). In Singapore and Hong Kong, the monetary authorities are also involved in the settlement of bond trades but in Hong Kong a CSD effects settlement for on exchange trades. Some respondents also indicated whether a DvP system is in use or not. DvP

settlement features in the Spanish, Mexican, Indian, Russian, South African and Singapore markets.

The responses to question 5.2 also suggest a fairly high level of vertical integration amongst the respondent exchanges in that over 80% of the relevant respondents claimed whole or at least partial ownership of the settlement organization. Only 5 exchanges indicated that the settlement organization was wholly independent of the exchange.

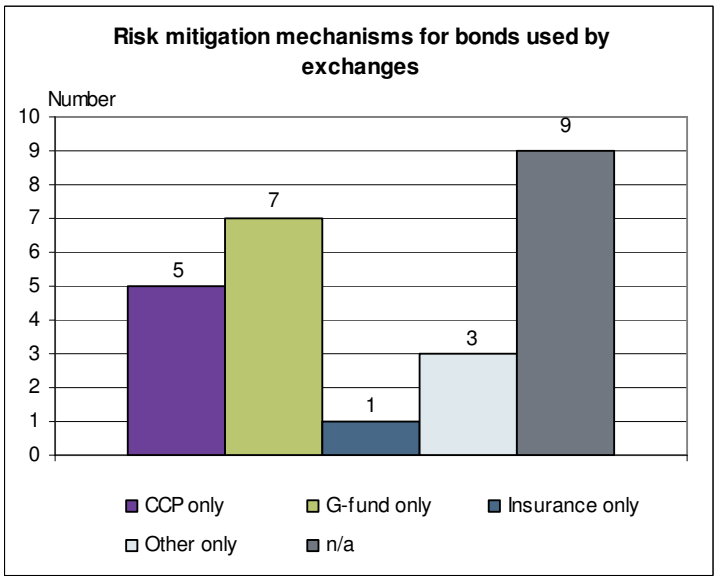
Figure 5.5.1



Questions 5.3 and 5.4

In Question 5.3 respondents were asked to indicate how the risk of bond trading is mitigated by the exchange. The options provided were: CCP (central counterparty) with clearing members; guarantee fund; insurance; other (specify). The responses received are collated in Figure 5.5.2.

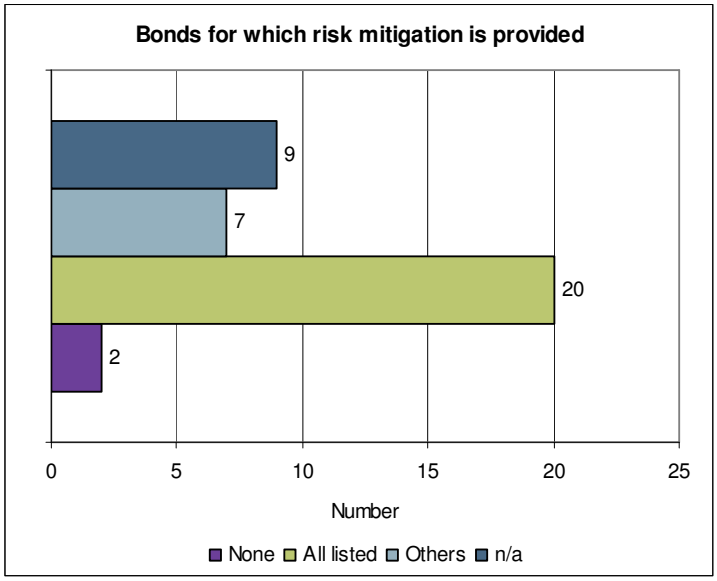
Figure 5.5.2



As can be seen from the responses, risk management of spot bond trading ranges from the utilization of a central counterparty structure to the provision of a guarantee fund and/or insurance to the lodging by trading parties of upfront collateral/guarantees (other). CCP functions or novation are provided by clearing houses. The clearing house basically becomes the counterparty to each trade, thus taking on the responsibility of ensuring that both the cash and the securities traded settle. In this manner, the risk of trading is transferred to the clearing house. To take on such risks, clearing houses have to ensure that they are well capitalized to cover defaults.

Several exchanges indicated that while they would provide risk management for all listed bonds, this only applied to trades conducted via the central order book (Question 5.4). Some exchanges indicated that risk management was restricted to certain categories of bonds such as government bonds (BME, JSE and effectively, Hong Kong) or investment grade bonds (Luxembourg).

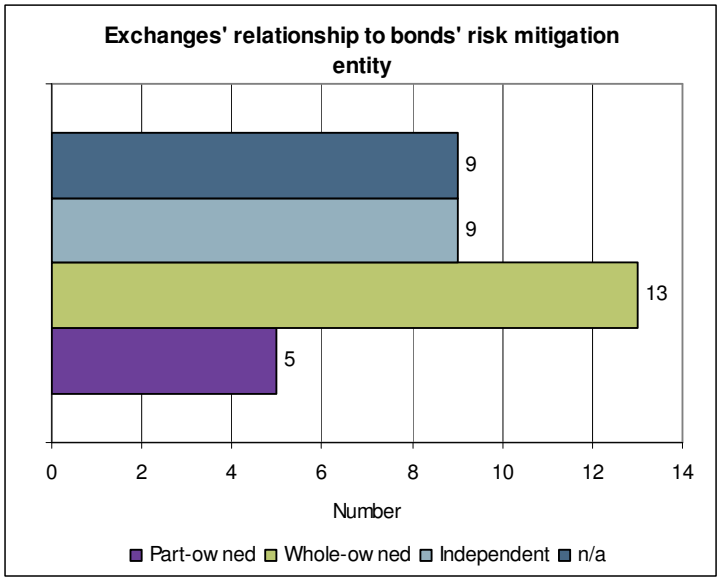
Figure 5.5.3



Question 5.5

Once again exchanges showed significant levels of equity ownership in the risk mitigation entities with over 60% of relevant respondents saying they either partly or wholly-owned the entity responsible for risk mitigation. While two exchanges did not provide an answer to this question, information from their websites suggests that the clearing houses in each respective market are indeed also fully owned by the exchanges. The exchanges in question are Oslo Børs which, however, only appears to provide clearing for equities at present, and Bolsa de Comercio de Buenos Aires.

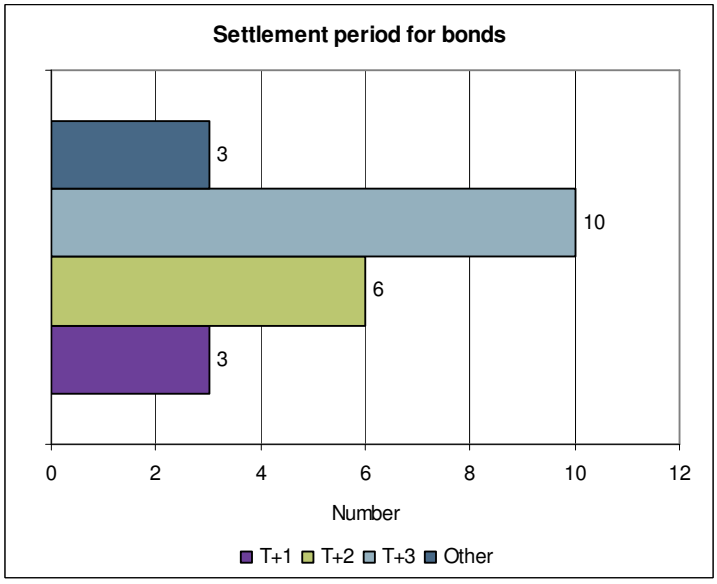
Figure 5.5.4



Question 5.6

Settlement cycles vary considerably across exchanges and across types of debt instruments, judging by the information provided in the survey. As outlined earlier, the CPSS and IOSCO recommendations stipulate that the ideal settlement cycle for all securities is T+3. This is, indeed, the predominant settlement cycle for exchange traded bonds (34% of respondents).

Figure 5.5.5



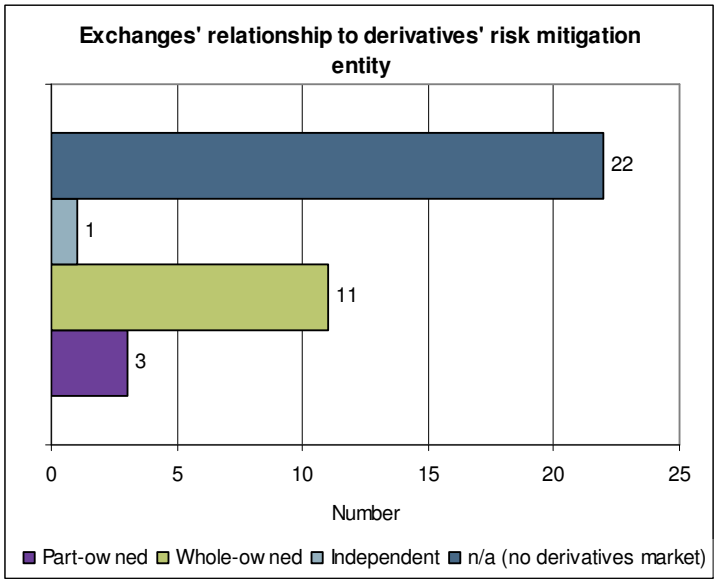
However, in a number of instances, more than one settlement cycle is applied, depending on the type of debt instrument traded or depending on the characteristics of the debt instrument. For instance, in the Australian market, OTC bond trades are settled on a T+1 basis; exchange traded bond trades are settled on a T+3 basis. In the Spanish market, the settlement period can be agreed bilaterally, however, the settlement cycle is generally T+2 for commercial paper and Treasury bills and T+3 for other bonds. In Colombia, the official settlement cycle is T+3 but most

trades settle T+0. In Malaysia, settlement occurs on a T+1 basis for short term bonds but on a T+2 basis for near and long term bonds. In Egypt, government bonds settle T+1 but all other bonds T+2. According to the Moscow Interbank Currency Exchange, bond trades' settlement can occur up to T+30. This is the longest settlement cycle highlighted by the survey.

Questions 5.7 and 5.8

Turning now to the question of clearing and risk mitigation of interest rate derivatives (Question 5.7) it stands to reason that most respondents (over 70% of exchanges that have a derivatives market; this percentage could in fact be as high as 100% but three respondents did not provide clear answers to this effect and the relevant information could not be verified by other means) indicated that clearing and risk management for these products occurred via a central counterparty/clearing member structure.

Figure 5.5.6



As regards ownership structures (Question 5.8), in only one instance did the responding exchanges not have at least a partial ownership stake in the post-trade risk mitigation entity (CBOE; the Options Clearing Corporation operates as an industry utility). When compared to the ownership structure for cash bond risk mitigation entities, it is clear that the preferred model for derivatives markets is one of vertical integration, where in 93% of the cases the clearing facility is owned, either entirely or partially, by the exchange. In contrast, the percentage for the cash bond market is 66%.

5.6 Section 6

The questions in Section 6 of the survey pertain to **general issues** affecting the bond and interest rate derivatives markets. The response rate per question is reported in Table 6.1.1.

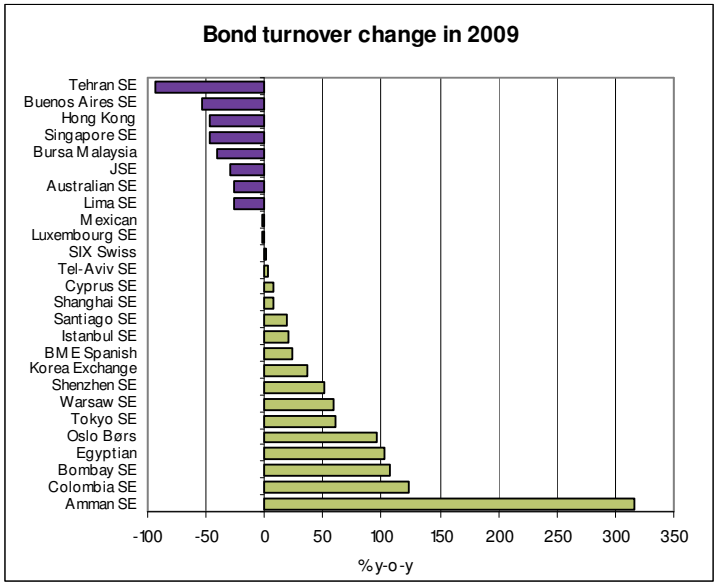
Table 6.1.1

Question number	Response rate (%)
6.1 (b)	90
6.2 (b)	97
6.3	81
6.4	69
6.5	71
6.6	53
6.7	81
6.8 (a)	96
6.8 (b)	56

Question 6.1 (a & b)

In Question 6.1 (a), respondents were required to provide the percentage change in the nominal value of turnover in bonds recorded by the exchange in 2009 relative to 2008. While 25 exchanges responded, the information provided did not coincide with the data available from the WFE. In some instances, the difference was substantial. Consequently, the data from the WFE were used for this analysis rather than the information provided by the respondents. Figure 6.1.1 shows which exchanges recorded increased turnover in bonds in 2009 and which exchanges recorded a contraction.

Figure 6.1.1



In part (b) of the question, respondents were asked to indicate what might have been the influencing factors for the change in turnover. It is difficult to draw over-arching conclusions from the explanations provided, though many exchanges attributed the growth or contraction to the way in which the global financial crisis continued to play out in their host economies and to the manner in which their governments responded (e.g. by issuing more or less debt instruments). In a few instances there were exchange-specific factors mentioned that contributed to growth. Interestingly, the Colombia SE noted that reduced competition from the OTC market resulted in higher on-exchange turnover. The Bombay SE reported that a marked increase in bond turnover was attributable to increased retail participation in the market. Likewise, the BME Spanish Exchanges mentioned the introduction of a new trading segment (guaranteed government

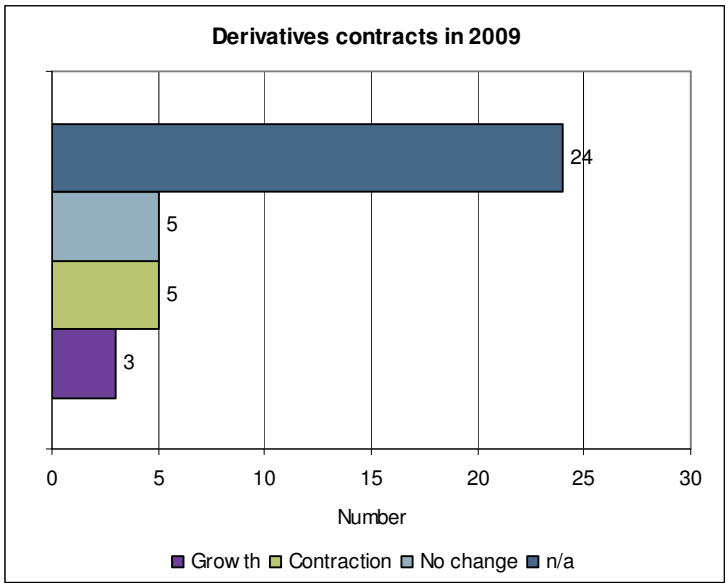
bonds) as a contributor to growth in value traded. On the Egyptian Exchange, increased turnover in government bonds through the PD system drove the increase in overall turnover.

Question 6.2 (a & b)

In Question 6.2 respondents were asked to provide the percentage change in the number of fixed income derivatives contracts traded on exchange in 2009 relative to 2008. In a second part of the question, they were asked to indicate which factors might have accounted for the change.

Of the 15 exchanges that have a derivatives market, 12 answered the question. According to the information provided by these respondents, interest rate derivatives trading volumes were relatively flat on at least 5 exchanges in 2009; 5 exchanges recorded lower trading volumes relative to 2008, while 3 recorded higher trading volumes. Among the responses, two substantial changes stand out. The Colombia SE recorded an increase of over 1000% in the number of contracts traded in 2009. This, however, was due to growth off a very low base, as the market was launched in 2008. Furthermore, the number of participants in the market increased substantially in 2009, as the exchange undertook market education initiatives and introduced new products. In contrast, the Moscow Interbank Currency Exchange reported a decline of 98.8% in volume traded, as a consequence of the economic crisis. Indeed, a few respondent exchanges again referenced the financial crisis as a reason for both growth and contraction in derivatives trading volumes.

Figure 6.1.2



It should be noted, however, that the data reported in the survey cannot be verified by cross-reference to WFE data. The WFE reports some statistics on derivatives but only for a few exchanges. However, the WFE/IOMA derivatives survey for 2009 reports that the financial crisis indeed translated into an overall decline in the global derivatives market relative to 2008. “Such stabilization is a break in the trend of uninterrupted growth recorded in all previous years since 1998”. As far as the interest products alone are concerned, these recorded negative growth in 2009, as in 2008. In particular, the market decline in STIR derivatives accelerated last year. Options declined by 9% and futures by 21%. NYSE Liffe overtook the CME Group as the world’s most active market for STIR options. According to the survey, the decline in LTIR products was,

however, the worst in 2009, among all classes of products. Large markets (CME, Eurex) were mostly responsible for this, while smaller markets (JSE, ASX, Bursa Malaysia, Korea Exchange) grew.

Questions 6.3 and 6.4

In each of these questions, the respondents were asked to indicate whether they intend to adopt measures aimed at encouraging the OTC market in bonds and fixed income derivatives respectively to move to trading on-exchange. The responses are summarised in the following figures.

Figure 6.1.3

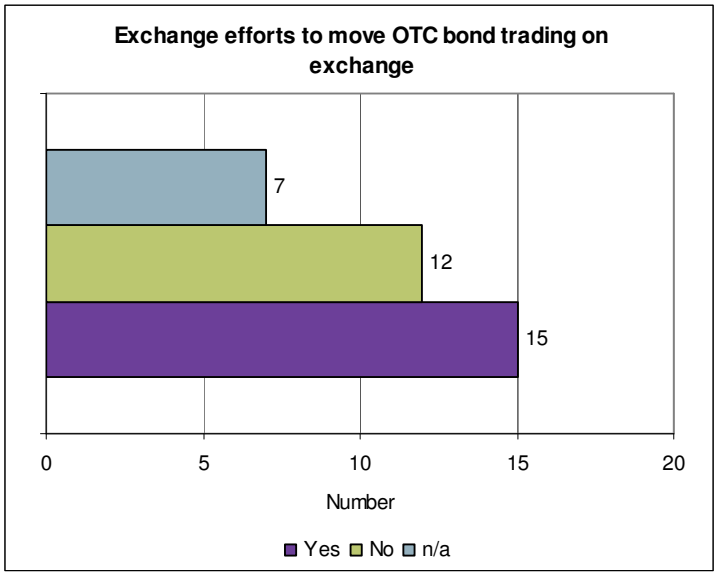
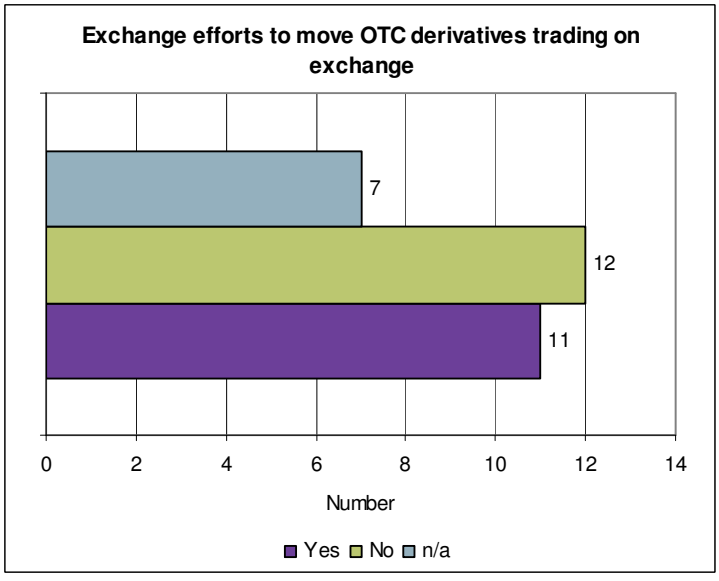


Figure 6.1.4



In the spot market, 15 respondent exchanges said that this was something they planned to do, while 12 exchanges answered in the negative. Four exchanges unfortunately did not answer this

question. As regards derivatives products, 11 exchanges said that they were planning to bring more OTC trading on exchange whereas 12 said it was not a focus for them and 8 exchanges did not answer the question. Many of the exchanges that answered "no" to the question do not currently trade interest rate derivatives, though some of the spot-only exchanges indicated that this was a focus for them suggesting a planned move into derivative products more generally. Exchanges were not asked to elaborate on their answers so this analysis is unfortunately somewhat speculative.

Questions 6.5 and 6.6

Figure 6.1.5

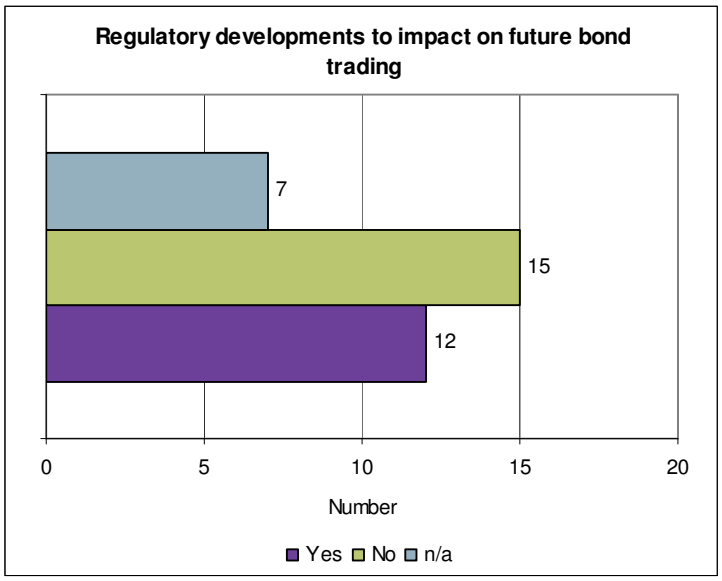
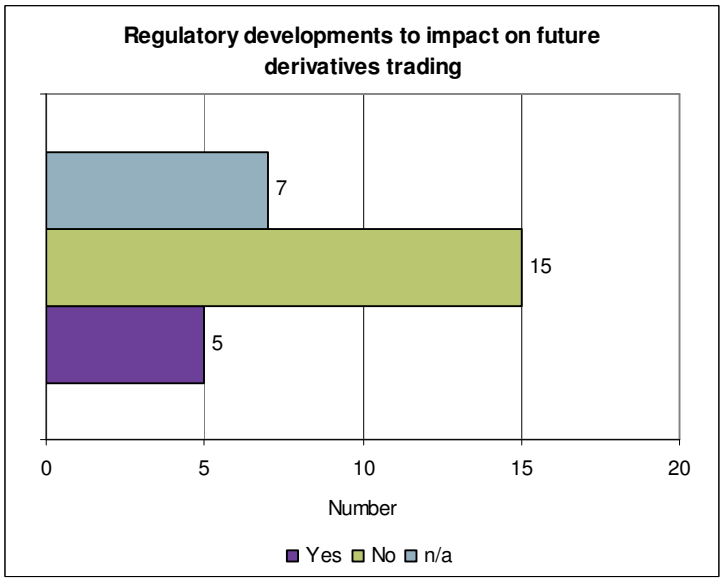


Figure 6.1.6



In these questions, respondents were asked to indicate whether there are any regulatory developments that will or are likely to impact in the future on trading in bonds and fixed income

derivatives respectively, for instance, where or how these are traded. The responses are summarised in the following figures.

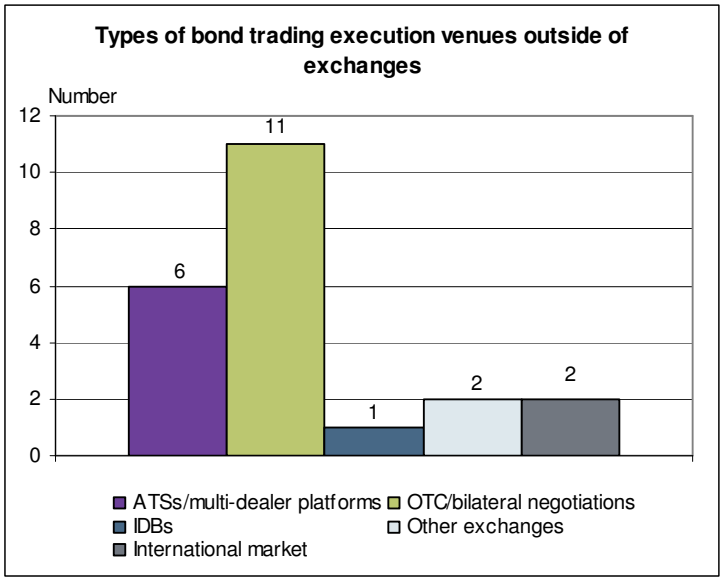
Twelve exchanges said they thought that such regulatory changes were forthcoming for spot bond products with 15 exchanges saying they didn't anticipate any regulatory changes, whereas for interest rate derivatives, only 5 exchanges said they thought that there would be regulations that would impact where and how these products will be traded. Fifteen exchanges said that they didn't anticipate any regulatory changes. As might be expected from a question relating to regulation, the responses tended to be jurisdiction specific. Thus, the European exchanges said that they expect when MiFID is revised, if spot bonds are included under its ambit, the best execution and transparency requirements should result in more on exchange trading of bonds. Other factors mentioned include expanding the range of potential market participants and introducing new regulations for certain categories of spot bond.

It is somewhat surprising given the near unanimous stated intention of regulators to "encourage" OTC derivative products to either be traded on exchange or at the very least cleared through a central counterparty that so few exchanges anticipate regulatory changes that will impact where and how interest rate derivatives are traded. This, coupled with the relatively low response rate to this question suggests that the findings unfortunately cannot be relied upon for the purposes of this survey.

Question 6.7

In Question 6.7 exchanges were asked whether there are alternative execution venues outside of the exchange, that is, competing venues. Five exchanges said that there were no alternative execution venues outside of the exchange (Amman, Egypt, Hong Kong, Oslo and Shenzhen). Of the 24 exchanges that said that bonds could be traded away from the exchange, the majority of alternative execution options mentioned were bilateral negotiation and alternative trading systems/multi-dealer platforms, The detailed breakdown of responses is shown in Figure 6.1.7.

Figure 6.1.7



These responses confirm those obtained in a similar question in Section 3 of the survey.

Question 6.8 (a & b)

In the final question, respondents were asked to indicate which entity/ties is/are responsible for the regulation of the bond market (a) and the interest rates derivatives market (b). From the responses received, it would appear that in the bulk of jurisdictions (14), the regulation of the bond market is carried out by independent regulators, at times these are government departments. In at least 10 jurisdictions, regulatory functions are carried out by a mix of institutions. The predominant mix is that of the exchange itself, operating as a self-regulatory organization (SRO), coupled with an external, independent regulator, which can include a government department, such as the Ministry of Finance. Another mix encountered is that of an external, independent regulator, coupled with the central bank. In only 4 instances is regulation only carried out by the exchanges themselves, acting as SROs.

Even though many exchanges do not have a derivatives market, they were expected to provide an answer to this question but only a low percentage did (56%). From the responses received, it would appear that the interest rates derivatives markets across jurisdictions also favour either independent regulation or regulation enforced by a mix of institutions. Ten respondents indicated that the interest rates derivatives markets in their jurisdictions are regulated by independent entities; 6 indicated that regulation is carried out either by the exchanges, acting as SROs and independent regulators (4 respondents) or by the exchanges acting as SROs and the central banks (2 respondents). Only 2 exchanges, acting as SROs, reported being the sole regulators of the derivatives markets in their jurisdictions.

Since the information provided by the respondents was brief rather than detailed, it is also difficult to reach any steadfast conclusions from the responses to this question. Clearly, however, in jurisdictions where regulation of the markets is the task of independent organizations there is a greater potential for competition and effective risk management. Naturally, this is dependent on the nature and reach of the regulation, as well as a host of other factors. One of the weaknesses of the markets highlighted by the 2008 global financial crisis was the absence of a single view of markets which could help identify market weaknesses and stresses. A consequence of this has been the heated debate around the need to tighten regulation and to encourage trading of securities onto regulated markets.

Nonetheless, this is a substantial challenge that regulators are likely to grapple with for some time. Given the interconnectivity of financial markets, regulatory changes will need to level the playing field across jurisdictions to be truly effective. This is the crux of the challenge.

6. Summary of findings

The key findings of the survey can be summarised as follows.

Primary bond markets

- Primary dealer (PD)/market maker systems are present in many markets but not in the majority of the markets surveyed.
- In 3 instances, the markets that have a PD system record strong turnover volumes (they are in the top 12 exchanges ranked by value of bond turnover in 2008.
- Government bond listings dominate in many of the markets surveyed, a prerequisite for a liquid and well-functioning bond market. However, in some markets, private listings dominate. This is either a consequence of the maturity of the market or the efficiency of the market.
- A variety of bond instruments are listed across the exchanges surveyed. The range of instruments on offer in a particular market can reveal important characteristics of that market. The most basic type of bond instrument found in at least 26 of the 29 relevant exchanges surveyed is the vanilla instrument, followed by zero-coupon bonds and asset-backed securitizations. FRNs are also listed on many exchanges.
- Credit ratings are not a prerequisite for the listing of debt instruments on the majority of exchanges surveyed.

Secondary bond markets

- The majority of exchanges surveyed indicate that bonds are traded on exchange (where on exchange also refers to trades brokered OTC but that are reported to an exchange).
- On exchange bond trading is not predominant due to legislative requirements, suggesting that the infrastructure and services offered by exchanges attract bond trading (and trade reporting).
- On exchange bond trading is widespread across a spectrum of instruments. In most instances, all types of bonds that are listed on an exchange can be traded on the exchange.
- While it is widely believed that there is still strong aversion to trading bonds on electronic central order books, at least 12 exchanges surveyed reported that this is how bonds are traded on their market.
- In contrast, no exchange offers only a report-only facility.
- According to the survey responses, at least 12 exchanges record more than half of all government bond trades on the COB facility. Only 6 exchanges record between 50% and 100% of government bond trades on the report-only facility.
- Private sector bonds seem to be predominantly traded on COB.
- When bond trades are not concluded on exchange, they are concluded off-exchange via other means/mechanisms. In some instances, trades are subsequently reported to an exchange. According to the survey, the predominant mechanism of off-exchange bond trading still involves bilateral negotiations, usually telephone brokerage. However, in many instances, a combination of bilateral negotiations, inter-dealer brokers and automated trading systems is used or available.
- Of the exchanges surveyed, only 8 reported having a repo market. While repo markets are conducive to increased bond market liquidity, there are some exchanges that record very high turnover volumes and yet have no repo markets.

- At least 14 of the exchanges surveyed (less than 50%) offer remote membership. The accessibility of an exchange via remote membership can be conducive to stronger turnover volumes. However, from the survey findings, it would appear that most exchanges that are ranked among the top 12 in terms of turnover volume recorded in 2008, do not offer remote membership. Only 3 do.

Derivatives markets

- Of the exchanges surveyed, at least 15 offer interest rate derivatives products. The majority offer LTIR. Just over 50% offer both STIR and LTIR.
- The Australian Stock Exchange is one of the few exchanges that provide an array of both STIR and LTIR products. Another such exchange is the Bolsa Mexicana de Valores.
- Three of the exchanges surveyed are strictly derivatives exchanges but one does not offer interest rates derivatives.

Post trade services: clearing and settlement

- Across most of the exchanges surveyed, CSDs oversee and effect the electronic settlement of spot bonds. DvP settlement, which is the recommended mode of settlement, occurs in a number of markets.
- There appears to be a fairly high level of vertical integration amongst respondent exchanges. Over 80% partly or fully own the settlement organization.
- Risk management for bond trading ranges from CCP novation, to guarantee fund and insurance. In the majority of cases, guarantee funds are used, but CCP novation is also quite popular.
- Risk mitigation is generally provided for all bonds listed on exchanges; however, several exchanges specified that risk mitigation is only applied to trades executed on COB.
- Vertical integration of exchanges into clearing services is also quite high. Nonetheless, there remain a number of independent clearing houses in some jurisdictions (9, according to survey responses).
- The recommended settlement cycle for all types of securities is T+3. Most exchanges have adopted this cycle for bonds but there are variations across bond types/bond characteristics.
- Clearing of interest rates derivatives mostly occurs via a CCP/clearing member structure.
- In 93% of the cases, the clearing facility is owned, either entirely or partially by the exchange.

General issues

- By and large, bond turnover volumes increased across exchanges in 2009. However, in those markets where a contraction in volume was recorded, the financial crisis was cited as a determining factor.
- The financial crisis also appears to have impacted on the trading volumes recorded in derivatives markets. The information provided by respondents, however, was sketchy. Findings from the WFE/IOMA derivatives market survey indicate that interest rates derivatives recorded negative growth in 2009, as in 2008, especially LTIRs. However, small markets fared better than large, dominant markets in this segment.

- Generally, exchanges appear to be keen to encourage OTC markets in bonds and derivatives to shift on exchange but the information available in this regard is inconclusive.
- Most respondents do not expect regulatory changes that will affect the manner and locus of trading of both bonds and interest rates derivatives. The information gathered in this regard is also considered inconclusive.
- There exist competing execution venues outside of exchanges (that compete with COB trading) but generally bilateral brokerage in OTC markets continues to feature strongly.
- Finally, in the bulk of jurisdictions, the regulation of the bond market is performed by independent regulators.
- Despite sketchy information, it would appear that the interest rates derivatives markets across jurisdictions also favour independent regulation or regulation enforced by a mix of institutions.

7. Annexures

7.1. Annexure 1

A list of WFE members and associates follows.

No.	Exchange name	Status	Response received
1	Amman Stock Exchange	Member	✓
2	Athens Exchange	Member	
3	Australian Securities Exchange	Member	✓
4	Bermuda Stock Exchange	Member	
5	BM&F Bovespa S.A,	Member	
6	BME Spanish Exchanges	Member	✓
7	Bolsa de Comercio de Buenos Aires	Member	✓
8	Bolsa de Comercio de Santiago	Member	✓
9	Bolsa de Valores de Colombia	Member	✓
10	Bolsa de Valores de Lima	Member	✓
11	Bolsa Mexicana de Valores	Member	✓
12	Bombay Stock Exchange Ltd.	Member	✓
13	Bourse de Luxembourg	Member	✓
14	Bursa Malaysia	Member	✓
15	Chicago Board of Options Exchange	Member	✓
16	CME Group	Member	✓
17	Colombo Stock Exchange	Member	
18	Cyprus Stock Exchange	Member	✓
19	Deutsche Börse AG	Member	
20	The Egyptian Exchange	Member	✓
21	Hong Kong Exchanges and Clearing	Member	✓
22	Indonesia Stock Exchange	Member	✓
23	Intercontinental Exchange ICE	Member	
24	International Securities Exchange – ISE	Member	✓
25	Irish Stock Exchange	Member	
26	Istanbul Stock Exchange	Member	✓
27	JSE Ltd.	Member	✓
28	Korea Exchange	Member	✓
29	London Stock Exchange Group	Member	
30	Malta Stock Exchange	Member	
31	Moscow Interbank Currency Exchange	Member	✓
32	NASDAQ OMX	Member	
33	National Stock Exchange of India	Member	
34	New Zealand Exchange Ltd.	Member	
35	NYSE Euronext	Member	✓
36	Osaka Securities Exchange	Member	✓
37	Oslo Børs	Member	✓
38	Philippine Stock Exchange	Member	✓
39	Saudi Stock Exchange (Tadawul)	Member	✓
40	Shanghai Stock Exchange	Member	✓
41	Shenzhen Stock Exchange	Member	✓
42	Singapore Exchange	Member	✓
43	SIX Swiss Exchange	Member	✓

No.	Exchange name	Status	Response received
44	Stock Exchange of Mauritius	Member	
45	Stock Exchange of Tehran	Member	✓
46	Stock Exchange of Thailand	Member	
47	Taiwan Stock Exchange	Member	✓
48	Tel-Aviv Stock Exchange	Member	✓
49	TMX Group Inc.	Member	
50	Tokyo Stock Exchange	Member	✓
51	Warsaw Stock Exchange	Member	✓
52	Wiener Börse AG	Member	
53	Depository Trust and Clearing	Associate	
54	Financial Industry Regulatory Authority	Associate	✓
55	Investment Industry Regulatory	Associate	
56	LCH Clearnet Limited	Associate	✓
57	The Options Clearing Corporation	Associate	
58	Takasbank – ISE Settlement and Custody Bank Inc.	Associate	

7.2. Annexure 2

Fixed Income Market Survey

Conducted by the
Johannesburg Stock Exchange (JSE)

On Behalf of the
World Federation of Exchanges (WFE)

2009

Distribution date: 27 November 2009

Deadline date: On or before 15 January 2010

Please return completed survey electronically to:

The Johannesburg Stock Exchange (JSE)
Strategy & Legal Counsel

Contact person: Monica Ambrosi
E-mail: monicaa@jse.co.za
Telephone: + 27 11 520 7809

Alternate contact: Siobhan Cleary
E-mail: siobhanc@jse.co.za
Telephone: +27 11 520 7248

Table of Contents

1. Objective

The objective of this survey is to:

- Obtain an understanding of the structure, size, and importance of *domestic* fixed income markets[3] as viewed by WFE members;
- Assess certain aspects of fixed income derivatives markets as viewed by WFE members;
- Identify common themes across fixed income markets and fixed income derivatives markets.

2. General guidelines

For ease of completion the survey is divided into 6 distinctly titled sections. The section titles, footnotes and other notes give survey participants an indication of the context within which to provide answers to the relevant questions.

Unless specific details are to be provided (e.g. values, percentages, text answers), participants should indicate their responses by placing an "X" in the space provided/boxes. At times, it might be appropriate for respondents to select more than one box.

Participants are required to respond to all questions or to as many questions as possible (and relevant) should they not be in a position to provide all of the information required. At all times, participants are required to provide responses that give the Exchange's view/experience/perception.

3. Participant details

Participants in this survey are required to provide all of the following information in the spaces provided:

Exchange Name: _____

Name of person completing survey: _____

Designation of person: _____

Direct telephone number (with country/area codes): _____

E-mail address: _____

[3] The terms fixed income, debt and bond markets can be used interchangeably

4. Survey

4.1 Section 1

Bond Market Development Indicators

4.1.1 Provide the ratio of public sector bonds (all government debt issuance) to the gross domestic product (GDP) for the following years:

2000: _____ 2008: _____

4.1.2. Provide the ratio of private sector bonds[4] in issue to the gross domestic product (GDP) for the following years:

2000: _____ 2008: _____

4.1.3 Provide the ratio of domestic debt securities (issued by the private and public sectors as well as parastatals) to the country's total debt securities[5] for the following years:

2000: _____ 2008: _____

4.1.4 Provide the ratio of private sector bonds in issue to total domestic debt securities (issued by the private and public sectors as well as parastatals) for the following years:

2000: _____ 2008: _____

4.1.5 Provide the turnover ratio[6] of

- Private sector bonds on exchange for the following years:
  2000: _____ 2008: _____
- Public sector bonds on exchange for the following years:
  2000: _____ 2008: _____

4.1.6 Provide the ratio of domestic short-term[7] bonds in issue to total domestic debt securities (issued by the private and public sectors as well as parastatals) for the following years:

2000: _____ 2008: _____

[4] Private sector bonds are bonds issued by corporates as opposed to government and parastatals/state owned institutions
[5] The country's total debt securities means total debt issuance domestically plus issuance on the international debt market
[6] Turnover ratio means the nominal value of turnover in bonds divided by the nominal value of outstanding debt stock
[7] Short-term bonds are defined as bonds with a maturity of up to 1 year

4.2 Section 2

Primary Bond Market

4.2.1 Does your bond market have a primary dealer/market maker system?

Yes ☐ No ☐

Comments (if any): _____

_____

The remaining questions in this section pertain to bond listings on the Exchange.

4.2.2 Provide the proportion (% of total nominal value listed) of bonds listed on the Exchange in 2008 in the following categories/sectors:

- Government (central, municipal, etc.) _____
- Parastatals/state owned enterprises _____
- Total private (corporates) sector _____

  Of which:

  Financial sector[8] _____

  Other _____

If the required level of detail for the private sector is not available, restrict your answer to the three main categories bulleted.

4.2.3 Indicate which of the following types of instruments were listed on the Exchange by the end of 2008:

Vanilla bonds	☐	Zero coupon bonds	☐
Inflation-linked bonds	☐	Commercial paper	☐
Asset-backed securitizations	☐	Bond ETFs	☐
Customized instruments	☐	Other	☐

Specify other: _____

_____

[8] Including all types of ABS

4.2.4 Are issuers required to obtain a credit rating for their issues?

Yes ☐ No ☐

4.2.5 If you answered yes to Question 4.2.4, is the requirement stipulated by:

Law ☐ Exchange rules ☐

4.3 Section 3

Secondary Bond Market: Trading

4.3.1 Are bonds traded on-Exchange?

Yes ☐ No ☐

Comments (if any): _____

_____

4.3.2 If bonds are traded on-Exchange, is it because it is compulsory?

Yes ☐ No ☐

Elaborate: _____

_____

4.3.3 If bonds are traded on-Exchange, indicate which types of bonds are traded:

_____

_____

_____

_____

4.3.4 Indicate how bonds are traded on-Exchange (if both, please select both boxes):

Electronic central order book ☐

Report-only facility ☐

4.3.5 Provide the nominal value of total turnover in bonds recorded by the Exchange in 2008 (in USD million terms, using the prevailing exchange rate as at 31 December):

Turnover (2008): _____

Note: the purpose of the following questions is to understand the proportion of trade that occurs via the central order book, relative to trading that occurs OTC and is reported to the Exchange.

4.3.6 Indicate the proportion of trading in bonds (% of total turnover recorded by the Exchange for each of the categories listed, whether on electronic central order book or via report-only) that was executed on the *electronic central order book* in 2008:

- Government (central, municipal, etc.) bonds _____
- Private sector (corporates) bonds _____
- Parastatals/state owned enterprises bonds _____
- Asset-backed securitizations _____

4.3.7 Indicate the proportion of trading in bonds (% of total turnover recorded by the Exchange for each of the categories listed, whether on electronic central order book or via report-only) that was only reported to the Exchange in 2008:

- Government (central, municipal, etc.) bonds _____
- Private sector (corporates) bonds _____
- Parastatals/state owned enterprises bonds _____
- Asset-backed securitizations _____

4.3.8 What is the trading method used for bond trades that occur off-Exchange?

Bilateral negotiations ☐ Inter-dealer brokers ☐

Via an Automated Trading System provided by another party (i.e. not the Exchange) ☐ Other ☐

Note: the purpose of the following question is to understand the extent to which turnover in a particular category of product is due to foreign participation in your market relative to local participation.

4.3.9 Indicate the proportion of trading (% of total turnover in categories listed) recorded by the Exchange that *foreign participants* were responsible for in 2008:

- % of government bonds turnover _____

- % of private sector bonds turnover _____
- % of parastatal bonds turnover _____
- % of asset-backed securitizations turnover _____
- % of total turnover on Exchange _____

(If the breakdown requested is not available, provide only the % of total turnover on Exchange)

4.3.10 Indicate the proportion of trading (% of total turnover) recorded by the Exchange for the following markets in 2008:

- Spot bond market _____
- Repo bond market _____
- Others _____

4.3.11 What proportion of total trading on the Exchange was accounted for by the following in 2008?

- Primary dealers _____
- Inter-dealer brokers _____
- Other members _____

4.3.12 Does your Exchange offer remote membership?

Yes ☐ No ☐

4.4 Section 4

Fixed income derivatives instruments

4.4.1 List the type of short-term fixed income *derivative* instruments, if any that are available for trading on-Exchange:

_____

_____

_____

_____

4.4.2 List the type of long-term fixed income *derivative* instruments, if any, that are available for trading on-Exchange:

_____

4.5 Section 5

Post trade services – clearing and settlement of bonds

4.5.1 How are bonds settled in your market?

4.5.2 What is the nature of the relationship (if any) between the Exchange and the organization/s that provide/s settlement for bonds?

4.5.3 How is the risk of bond trading mitigated by your Exchange?

CCP with clearing members	☐	Guarantee fund	☐
Insurance	☐	Other	☐

Specify other: _____

4.5.4 For which types of bonds do you provide risk mitigation (please list)?

4.5.5 What is the nature of the relationship (if any) between the Exchange and the organization/s that provide/s risk mitigation for bonds?

_____

_____

_____

_____

4.5.6 Indicate the settlement period for bonds (e.g. T+1, T+2, etc.):

_____

Post trade services – clearing of fixed income derivatives

4.5.7 Explain how fixed income derivatives are cleared.

_____

_____

_____

_____

4.5.8 What is the nature of the relationship (if any) between the Exchange and the organization/s that provide/s clearing for fixed income *derivatives*?

_____

_____

_____

_____

4.6 Section 6

General (bonds and fixed income derivatives)

4.6.1 Provide the % change in the nominal value of turnover in bonds recorded by the Exchange in 2009 relative to 2008 and a brief explanation of the factors responsible for the change:

% change: _____

Explanation: _____

_____

_____

_____

4.6.2 Provide the % change in the number of fixed income *derivatives* contracts traded on the Exchange in 2009 relative to 2008 and a brief explanation of the factors responsible for the change:

% change: _____

Explanation: _____

_____

_____

_____

4.6.3 Do you intend to adopt measures aimed at encouraging the OTC market in bonds to move to trading on-Exchange?

Yes ☐ No ☐

4.6.4 Do you intend to adopt measures aimed at encouraging the OTC market in fixed income *derivatives* to move to trading on-Exchange?

Yes ☐ No ☐

4.6.5 Are there any regulatory developments that will/are likely to impact in the future on trading in bonds (e.g. where or how these are traded)? If yes, please provide a brief explanation.

Yes ☐ No ☐

Elaborate: _____

_____

4.6.6 Are there any regulatory developments that will/are likely to impact in the future on trading in fixed income *derivatives* (e.g. where or how these are traded)? If yes, please provide a brief explanation.

Yes ☐ No ☐

Elaborate: _____

_____

4.6.7 Are there currently alternative execution venues outside of the Exchange for the trading of bonds?

Yes ☐ No ☐

Elaborate: _____

_____

4.6.8 Who regulates the following markets in your country/jurisdiction?

Bond (public and private) market - _____

Fixed income derivatives market - _____

7.3. Annexure 3

Predominant types of bond securities and a brief description.

Amortizing instruments – portions of the principal debt are periodically repaid along with the loan's interest payments until the loan matures.

Asset backed securitization –bonds based on a pool of underlying assets. A special purpose trust or vehicle (SPV) is set up to take up title to the assets and the cash flows are passed through to the investors in the form of an asset-backed security. There are a variety of assets that can be securitized: residential and commercial mortgages; various types of debt receivables (e.g. credit card debt; general loans).

Bond ETF – a fund that is traded on exchange and that holds bonds as assets. The ETF trades at approximately the same price as the net asset value of the underlying bonds during a trading session. A bond ETF can also track the movement of bond indices.

Commercial paper – an unsecured short-term instrument akin to a promissory note with a fixed income maturity generally of between 1 and 270 days.

Covered bonds – these bonds are backed by cash flows from mortgages or public sector loans. In this sense they are similar to securitizations, however, unlike the latter, they remain on the balance sheets of the issuers.

Credit-linked notes (CLNs) – securities with an embedded credit default swap allowing the issuer to transfer a specific credit risk to credit investors. The issuer is therefore not obliged to repay the debt if a specified event occurs.

Floating rate notes (FRNs) – bonds with a variable coupon equal to a money market reference rate plus a spread.

Hybrids/convertible bonds – hybrids are instruments that combine the interest payments of bonds with features of equity. Similarly, convertible bonds are bonds that can be converted into shares of common stock in the issuing company or cash of equal value at an agreed upon price.

Inflation-linked bonds – bonds that provide protection against inflation; the principal debt is indexed to inflation.

Medium-term notes (MTNs) – notes that mature in 5 to 10 years.

Perpetuity bonds – the principal debt on these bonds is never repaid and there is therefore no present value for the instruments. As there is no maturity, interest payments continue forever.

Pfandbriefe – a type of bond issued by German mortgage banks that is collateralized by long-term assets and thus also similar to securitizations, albeit that it is generally also referred to as a covered bond.

Subordinated debt – this type of debt ranks after other debts should a company fall into receivership or be closed.

Structured notes – appear to be bonds but contain embedded options (which can be exotic) and therefore do not necessarily reflect the risk of the issuing credit.

Sukuk – the Islamic equivalent of a bond instrument, which constitutes partial ownership in a debt, asset, project, business or investment. A sukuk is an Islamic financial certificate that complies with Sharia, Islamic Religious Law. The traditional interest payment structure of a bond is not permitted by Sharia. Consequently, the issuer of a sukuk sells an investor group the certificate which is then sold back to the issuer for a predetermined rental fee. The issuer makes a contract promise to buy back the bonds at a future date at par value.

Vanilla bonds – have a fixed date of maturity or expiry when they are issued and a contractual rate of interest.

Zero-coupon bonds – purchased at a discount (price lower than face value) while face value is paid upon maturity. There are no interest payments.

7.4. Annexure 4

Individual exchanges' profiles[9]

Exchange: Amman Stock Exchange
Country: Jordan
Region: Middle East

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☑ COB	☐ Report-only	☐ Both

Method predominantly used: COB
Off exchange trading method: ATS
Repo instruments: No
Bonds clearing: Guarantee Fund
Settlement cycle: T+2

Derivatives:	☐ STIR	☐ LTIR

Exchange: Australian Stock Exchange
Country: Australia
Region: Pacific

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☑ COB	☐ Report-only	☐ Both

Method predominantly used: Unknown
Off exchange trading method: Bilateral, IDBs, ATS
Repo instruments: Unknown
Bonds clearing: CCP
Settlement cycle: T+3

Derivatives:	☑ STIR	☑ LTIR

[9] There are some inconsistencies for certain jurisdictions; this is entirely owing to the information provided by relevant exchanges.

Exchange: BME Spanish Exchanges
Country: Spain
Region: Europe

Remote membership	✓	Yes		No
Bond market:	✓	Yes		No
Primary dealer/market maker system:		Yes	✓	No
On exchange trading:	✓	Yes		No

Trading methods available:		COB		Report-only	✓	Both

Method predominantly used: Report-only
Off exchange trading method: Bilateral, IDBs, ATS
Repo instruments: Yes
Bonds clearing: CCP, capital requirements & guarantees
Settlement cycle:

Derivatives:		STIR	✓	LTIR

Exchange: Bolsa de Comercio de Buenos Aires
Country: Argentina
Region: South America

Remote membership		Yes	✓	No
Bond market:	✓	Yes		No
Primary dealer/market maker system:		Yes	✓	No
On exchange trading:	✓	Yes		No

Trading methods available:		COB		Report-only	✓	Both

Method predominantly used: Unknown
Off exchange trading method: Bilateral, IDBs
Repo instruments: Unknown
Bonds clearing: CCP, Guarantee Fund
Settlement cycle: T+3

Derivatives:	✓	STIR	✓	LTIR

Exchange: Bolsa de Valores De Colombia
Country: Colombia
Region: South America

Remote membership	☐	Yes	☑	No
Bond market:	☑	Yes	☐	No
Primary dealer/market maker system:	☐	Yes	☑	No
On exchange trading:	☑	Yes	☐	No

Trading methods available:	☐	COB	☐	Report-only	☑	Both

Method predominantly used: COB
Off exchange trading method: Bilateral, IDBs, ATS
Repo instruments: Yes
Bonds clearing: Guarantee Fund
Settlement cycle: T+3

Derivatives:	☑	STIR	☑	LTIR

Exchange: Bolsa de Comercio de Santiago
Country: Chile
Region: South America

Remote membership	☐	Yes	☑	No
Bond market:	☑	Yes	☐	No
Primary dealer/market maker system:	☐	Yes	☑	No
On exchange trading:	☑	Yes	☐	No

Trading methods available:	☐	COB	☐	Report-only	☑	Both

Method predominantly used: Unknown
Off exchange trading method: Bilateral
Repo instruments: Unknown
Bonds clearing: Guarantee Fund
Settlement cycle: T+1

Derivatives:	☐	STIR	☑	LTIR

Exchange: Bolsa de Valores de Lima
Country: Peru
Region: South America

Remote membership	☐	Yes	☑	No
Bond market:	☑	Yes	☐	No
Primary dealer/market maker system:	☑	Yes	☐	No
On exchange trading:	☑	Yes	☐	No

Trading methods available:	☑	COB	☐	Report-only	☐	Both

Method predominantly used: COB
Off exchange trading method: Bilateral, ATS
Repo instruments: Yes
Bonds clearing: Guarantee Fund
Settlement cycle: T+1

Derivatives:	☐	STIR	☐	LTIR

Exchange: Bolsa Mexicana de Valores
Country: Mexico
Region: South America

Remote membership	☐	Yes	☑	No
Bond market:	☑	Yes	☐	No
Primary dealer/market maker system:	☑	Yes	☐	No
On exchange trading:	☑	Yes	☐	No

Trading methods available:	☑	COB	☐	Report-only	☐	Both

Method predominantly used: COB
Off exchange trading method: IDBs
Repo instruments: Unknown
Bonds clearing: Insurance
Settlement cycle: T

Derivatives:	☑	STIR	☑	LTIR

Exchange: Bombay Stock Exchange
Country: India
Region: Asia

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: COB
Off exchange trading method: Bilateral, IDBs, ATS
Repo instruments: Unknown
Bonds clearing: CCP
Settlement cycle: T+2

Derivatives:	☐ STIR	☐ LTIR

Exchange: Bourse de Luxembourg
Country: Luxembourg
Region: Europe

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: COB
Off exchange trading method: Bilateral
Repo instruments: Unknown
Bonds clearing: CCP
Settlement cycle: T+3

Derivatives:	☐ STIR	☐ LTIR

Exchange: Bursa Malaysia
Country: Malaysia
Region: South East Asia

Remote membership	☐	Yes	☑	No
Bond market:	☑	Yes	☐	No
Primary dealer/market maker system:	☐	Yes	☑	No
On exchange trading:	☑	Yes	☐	No

Trading methods available:	☐	COB	☐	Report-only	☑	Both

Method predominantly used: Unknown
Off exchange trading method: Bilateral, IDBs
Repo instruments: Unknown
Bonds clearing: Other (by central bank)
Settlement cycle: T+1; T+2

Derivatives:	☐	STIR	☑	LTIR

Exchange: Chicago Board Options Exchange
Country: USA
Region: North America

Remote membership	☑	Yes	☐	No
Bond market:	☐	Yes	☑	No
Primary dealer/market maker system:	☐	Yes	☐	No
On exchange trading:	☐	Yes	☐	No

Trading methods available:	☐	COB	☐	Report-only	☐	Both

Method predominantly used: n/a
Off exchange trading method: n/a
Repo instruments: n/a
Bonds clearing: n/a
Settlement cycle: n/a

Derivatives:	☑	STIR	☑	LTIR

Exchange: Chicago Mercantile Exchange
Country: USA
Region: North America

Remote membership	☑ Yes	☐ No
Bond market:	☐ Yes	☑ No
Primary dealer/market maker system:	☐ Yes	☐ No
On exchange trading:	☐ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☐ Both

Method predominantly used: n/a
Off exchange trading method: n/a
Repo instruments: n/a
Bonds clearing: n/a
Settlement cycle: n/a

Derivatives:	☑ STIR	☑ LTIR

Exchange: Cyprus Stock Exchange
Country: Cyprus
Region: Europe

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☑ COB	☐ Report-only	☐ Both

Method predominantly used: COB
Off exchange trading method: ATS
Repo instruments: No
Bonds clearing: Guarantee Fund
Settlement cycle: T+3

Derivatives:	☐ STIR	☐ LTIR

Exchange: Egyptian Exchange
Country: Egypt
Region: North Africa

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☑ COB	☐ Report-only	☐ Both

Method predominantly used: COB
Off exchange trading method: Bilateral
Repo instruments: No
Bonds clearing: Guarantee Fund, Insurance
Settlement cycle: T+1; T+2

Derivatives:	☐ STIR	☐ LTIR

Exchange: Hong Kong Exchanges and Clearing
Country: People's Republic of China
Region: Asia

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☑ COB	☐ Report-only	☐ Both

Method predominantly used: Unknown
Off exchange trading method: Other (not specified)
Repo instruments: No
Bonds clearing: CCP, Guarantee Fund
Settlement cycle: T+2

Derivatives:	☐ STIR	☑ LTIR

Exchange: Istanbul Stock Exchange
Country: Turkey
Region: Middle East

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: COB
Off exchange trading method: Bilateral
Repo instruments: Yes
Bonds clearing: Guarantee Fund, Other (not specified)
Settlement cycle: Unknown

Derivatives:	☐ STIR	☐ LTIR

Exchange: Indonesia Stock Exchange
Country: Indonesia
Region: South East Asia

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: Report-only
Off exchange trading method: Bilateral, Other (not specified)
Repo instruments: Unknown
Bonds clearing: Guarantee Fund
Settlement cycle: T+2

Derivatives:	☐ STIR	☐ LTIR

Exchange: Johannesburg Stock Exchange
Country: South Africa
Region: Sub-Saharan Africa

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: Report-only
Off exchange trading method: Bilateral
Repo instruments: Yes
Bonds clearing: Guarantee Fund, CCP
Settlement cycle: T+3

Derivatives:	☑ STIR	☑ LTIR

Exchange: Korea Exchange
Country: South Korea
Region: Asia

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☑ COB	☐ Report-only	☐ Both

Method predominantly used: COB
Off exchange trading method: IDBs
Repo instruments: Yes
Bonds clearing: Guarantee Fund, CCP
Settlement cycle: T+1

Derivatives:	☑ STIR	☑ LTIR

Exchange: Moscow Interbank Currency Exchange
Country: Russia
Region: Europe

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: COB
Off exchange trading method: Bilateral, ATS
Repo instruments: Yes
Bonds clearing: Collateral
Settlement cycle: T+1

Derivatives:	☑ STIR	☐ LTIR

Exchange: Oslo Børs
Country: Norway
Region: Europe

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: Report-only
Off exchange trading method: Bilateral
Repo instruments: Yes
Bonds clearing: Unknown
Settlement cycle: T+3

Derivatives:	☐ STIR	☐ LTIR

Exchange: NYSE Euronext (American market)
Country: USA
Region: North America

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☑ COB	☐ Report-only	☐ Both

Method predominantly used: COB
Off exchange trading method: Bilateral, IDBs, ATS, other (not specified)
Repo instruments: Unknown
Bonds clearing: Unknown
Settlement cycle: T+3

Derivatives:	☐ STIR	☐ LTIR

Exchange: Saudi Stock Exchange (TADAWUL)
Country: Saudi Arabia
Region: Middle East

Remote membership	☐ Yes	☑ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☑ COB	☐ Report-only	☐ Both

Method predominantly used: Report-only
Off exchange trading method: Bilateral
Repo instruments: No
Bonds clearing: Guaranteed by Saudi Arabian Monetary Agency
Settlement cycle: T+2

Derivatives:	☐ STIR	☐ LTIR

Exchange: Shanghai Stock Exchange
Country: People's Republic of China
Region: Asia

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: COB
Off exchange trading method: Bilateral, IDBs, ATS
Repo instruments: Yes
Bonds clearing: CCP
Settlement cycle: T+1

Derivatives:	☐ STIR	☐ LTIR

Exchange: Shenzhen Stock Exchange
Country: People's Republic of China
Region: Asia

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☑ COB	☐ Report-only	☐ Both

Method predominantly used: COB
Off exchange trading method: Bilateral, IDB
Repo instruments: Yes
Bonds clearing: CCP
Settlement cycle: T+1

Derivatives:	☐ STIR	☐ LTIR

Exchange: Singapore Stock Exchange
Country: Singapore
Region: South East Asia

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☐ Yes	☑ No

Trading methods available:	☐ COB	☐ Report-only	☐ Both

Method predominantly used:
Off exchange trading method: Bilateral, IDBs, ATS
Repo instruments: Unknown
Bonds clearing: Guarantee Fund, CCP
Settlement cycle: Other (depends on bondholder)

Derivatives:	☐ STIR	☑ LTIR

Exchange: SIX Swiss Exchange
Country: Switzerland
Region: Europe

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: Even between COB and Report-only
Off exchange trading method: Other (not specified)
Repo instruments: No
Bonds clearing: CCP
Settlement cycle: T+3

Derivatives:	☐ STIR	☐ LTIR

Exchange: Tel-Aviv Stock Exchange
Country: Israel
Region: Middle East

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☐ Yes	☑ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: COB
Off exchange trading method: Bilateral
Repo instruments: No
Bonds clearing: Guarantee Fund, CCP
Settlement cycle: T+1 and T

Derivatives:	☐ STIR	☐ LTIR

Exchange: Tokyo Stock Exchange
Country: Japan
Region: Asia

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☐ COB	☐ Report-only	☑ Both

Method predominantly used: COB
Off exchange trading method: Bilateral, IDBs, ATS
Repo instruments: Unknown
Bonds clearing: Guarantee Fund, CCP
Settlement cycle: T+3

Derivatives:	☐ STIR	☑ LTIR

Exchange: Warsaw Stock Exchange
Country: Poland
Region: Europe

Remote membership	☑ Yes	☐ No
Bond market:	☑ Yes	☐ No
Primary dealer/market maker system:	☑ Yes	☐ No
On exchange trading:	☑ Yes	☐ No

Trading methods available:	☑ COB	☐ Report-only	☐ Both

Method predominantly used: Unknown
Off exchange trading method: Bilateral, ATS
Repo instruments: Unknown
Bonds clearing: Guarantee Fund
Settlement cycle: T+2

Derivatives:	☐ STIR	☐ LTIR