Study of capital market development ways throughout the analysis of Global Exchange's competition system

(글로벌 거래소의 경쟁체제 분석을 통한 (한국)자본시장 발전방안 연구)

Contents

Ⅰ. Introduction

The liberalization of capital markets and the development of alternative trading systems in the last 30 years has changed the global exchange market drastically in terms of regulation and technology. Global exchanges that have lost their monopoly position due to intensified competition drove stock companies from non-profit membership companies to improve the service and actively engaged in mergers and acquisitions within the exchange industry.

In particular, changes in the regulatory environment in North America and Europe have led to changes in the topography of the Gobal exchange. It has had a big impact on the Global trading markets. Reg NMS(National Market System) in the United States and MiFID(Market in Financial Instruments Directive) in Europe contributed to the liquidity provision and efficiency of the global exchange market by recognizing ATS(Alternative Trading System) as the type of market trading platform and by promoting competition between markets. As a result of lower commissions and various trading services from the development of financial IT technology, the market is rapidly expanding and competition among markets is becoming more intense.

The traditional global Exchanges have taken actions in order to respond to competition with ATS such as improvement of transaction fees and improvement of trading system. On the other hand, Recent changes, such as lower transaction fees and competition for speed of trading have diminished interest in small

stocks in the market

However, the Korean trading market is still in the monopoly system of the Korea Exchange and is a position that is one step back from the big change trends. On the recent days, there are trends of dissicussion of the amendment of the Capital Market Law, including the introduction of competion system and the exchange license system. If these discussions are realized, the trading structure of the stock market in Korea will also undergo a full-fledged change. It is necessary to be prepared to have a system and capacity to oversee as the market becomes complicated and adaptable to a highly competitive environment.

My study will examine the effects of regulatory environment for promoting commercialization, changes of various types, alternative transaction systems and emergence of high frequency trading, environmental series changes surrounding capital markets. The case study of countries that have experienced market segmentation and integration and competition will implicate future change of Korea capital market. This report will be able to improve your understanding of Gobal Exchanges and to draw implications for the development of domestic capital markets and promote competition and market transparency.

Ⅱ. Study Background

The development of financial IT in the 2000s and the introduction of the main regulations regulating the stock market led to dramatic changes in the global trading market environment. Drivers of transformation at the time create a more competitive trading environment and the best investment climate for investors was doing. Exchanges faced with a competitive environment can be divided into traditional business strategies and structures and the need to rebuild the business. Now, major global exchanges are more like an IT service company than public infrastructure.

Regulations that caused global change in macro and micro structure of global trading market are Reg NMS (Regulation National Market System) and EU markets in Financial Instruments Directive (MiFID). With the introduction of regulatory reform, alternative trading systems other than regular exchanges are listed. It has spread rapidly, being recognized as a formal market for trading ceremonies. ATS armed with low commission, high-function system, and new trading mechanism has changed the map of the exchange industry by rapidly submerging liquidity of existing exchanges.

The traditional exchanges are coping with improvement of commission system, providing incentives to institutional investor, improving the trading system, and expanding stocks subject to trading in order to respond to the competition with the ATS. Meanwhile, there are many cases in which the alternative transaction system is opened by itself or merger and acquisition

with other exchanges or alternative trading systems happen. While boundary between exchange and ATS are hard to recognized, now boundary between open and non-open market emerged. It is important issue how to find a balance between demand of non-open market and securing market transparency in North America and Europe. In Asia, the paradigm shift is recognized. Regulations are changing in a way that demand for electronic trading and diversified trade services is increasing. However, the regulation level is still high and the gap of liquidity among countries and technological capabilities among investors is still large, so time seems to be needed until this trend spread all over the asian countries.

The growth of financial information volume and the progress of information processing capacity have led the US and European trading markets to direct market access (DMA) environment. DMA is a trading system in which securities are traded investors directively order to exchange or ATS by using a self-directed order management system. The most striking aspect in the trading behavior of global trading market is appearance of the the High Frequency Trading(HFT). Since it provide a lot of liquidity to the market through DMA, global exchange and alternative trading systems and brokers not only offer a variety of algorithms to attract these high frequency traders, but also provide a number of services for these algorithms to be successful.

Global exchanges are making various efforts to survive in a competitive environment and also are trying to enlist companies, which is the intrinsic function of the exchange. It is very important

to establish new market effectively functioning as main markets and off-board market in that growth of medium-sized and venture companies is essential for the future growth of the nation. Like in this context, many global exchanges are rushing to open new markets.

Currently, Korea's trading market environment and market participants are different from the trading market in North America and Europe. The diversity of the buy-side is lacking and there are not many ways to buy and sell transactions, so demand for trading infrastructure and commercialization potential are lower than in the global market. In addition, under the current capital market law, only the Korea Exchange functions as a unique trading market. Therefore, the emergence of an alternative trading system is not possible at all. However, if the emergence of an alternative trading system becomes visible through the amendment of the Capital Market Law, the competition between trading markets can be triggered, and regulation introduction for a more transparent trading market environment should be needed. These days, the attention of policy makers about the role of the exchange for raising capital has also been heightened. This report is that I check the changing situation of domestic stock market and would like to suggest implication for policy making through survey and analysis about global exchange market experiencing those changes ahead of us.

< Discussion Order >

This report will say first (In chapter Ⅱ), the background and framework of the report and In chapter Ⅲ, I will analyze the commercialization of the exchange and the status of the merger & acquisition and look at its background. In Chapter Ⅳ, I will review the changes in the regulatory environment that had a great impact on the US market and the European market. In Chapter V, I will discuss the impact of IT innovation like the emergence of alternative trading systems, high frequency trading on the trading market. In chapter Ⅵ, I will explain the situation of Kore exchange industry. In chapter Ⅶ, I will draw implications and policy consideration factors for kore exchange industry.. Finally, in Ⅷ paper, I will try to give some proposals for Korea capital market development, specically focusing on the exchange industry.

Ⅲ. Comercialization of the Exchanges

1. The Exchange's demutualization and listing

Until 20 years ago, most of the exchanges were operated as membership structure. Members had ownership of the exchange, decision-making rights, and trading rights, and maintained a monopoly position within a specific country or region. In the 1990s, changes in the structure of the exchange industry began to take place. With the development of electronic trading and the liberalization of capital movements, competion among the exchanges began. These changes deluted the physical importance of the exchanges and the public concept as a economic infrastructure. The exchanges had recognized the need for re-construction of traditional business strategy and structure. Since then they began to transit to stock-companies for seeking profit through deviation from the mutual association (membership). "Demutualization" means the change of the exchanges from "to provide services for the benefit of members" to "to maximize the profits that can be gained through services providing".

① Demutualization and listing situation

The process of transforming of the exchanges from non-profit union into profit stock companies is classified as five steps: ① union under membership control, ② unlisted private companies owned by member, ③ unlisted private companies owned by limited shareholders (members and non-members), ④ listed companies

owned by imited shareholders (members and non-members), ⑤ listed companies owned by decentalized shareholders.

While in a union structure, one member is entitled to one vote and decision-making is done by agreement, in stock companies one vote is given to one share and decisions are made by a majority vote.

In union type exchange, the ownership and trading rights are iintegrated, but in stock type exchange, the ownership and trading rights are separated. That is, in stock exchange, a member who has a trading right does not necessarily have to be a shareholder of the Exchange.

According to statistics from the World Federation of Exchanges (WFE), among the member exchanges, the share of exchanges operated for commercial purposes had increased steadily, which was 38% in 1998, 63% in 2002, 76% in 2007, and 83% in 2011, respectively. As shown below table(statistics from the World Federation of Exchanges (WFE)), as of 2011, North and South America and Europe, Africa and the Middle East respectively 92% and 83% of the exchanges are for commercial purposes, and 72% of the Asian exchanges are also for profit purpose. In terms of the legal form of the exchange, listed companies account for 44% and demutualization(Unlisted corporations) and private non-public companies account for 15% respectively and union 8%, which listed companies's portion is the largest of all.

From the perspect of region, North and South America are mostly listed companies, while Europe, Africa and the Middle East are listed companies or private non-public companies, and Asia are listed companies or demutualization types. NYSE Euronext,

NASDAQ OMX, Deutsche Börse, the London Stock Exchange (LSE), which are representative exchanges in North America and Europe, are all listed companies. Asian exchanges other than Chian such as Tokyo Stock Exchange (TSE), KRX (Korea Exchange), Taiwan Stock Exchange (TWSE), National Stock Exchange of india (NSE) are all demutualized unlisted stock companies. China's Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE) are operated as the form of union.

< Classification the exchange types by region >

		America	Asia Pacific	EAME	Total
profit	for-profit	11	13	19	43
	Non for-profit	1	5	3	9
Legal Status	Listed	11	6	6	23
	Demutualized	0	5	3	8
	Private	0	2	6	8
	Association	1	3	0	4
	Others	0	2	7	9
	Total	12	18	22	52

* source : WFE

After the Stockholm Stock Exchange was the first to transfer into demutualized stock companies in 1993, there were two demutualization waves in the early and mid-2000s. Between 2000 and 2001, 18 exchanges including HKEx (Hong Kong Exchange), TSE, Deutsche Börse, Euronext, LSE, NASDAQ, TMX (Toronto Stock Exchange) were demutualized, from 2005 to 2006 nine exchanges including NYSE, CBOT (Chicago Board of Trades) and KRX was demutualized. Most large exchanges demutualized are

listed itselft either simultaneously or immediately afterwards.

In recent years, demutualization and listing are being carried out mainly in emerging markets exchanges.

< Demutalization and enlisting of the global main exchanges >

Area	the exchanges	deumutualization	listing
Asia	Australian SE	1998	1998
	Bombay SE	2005	-
	Bursa Malaysia	2004	2005
	Colombo SE	2012	-
	HKEx	2000	2000
	Indonesia SE	-	-
	Korea Ex	2005	-
	New Zealnad SE	2003	2003
	NSE India	1993	-
	Osaka SE	2001	2004
	Philippine SE	2001	2003
	Shanghai SE	-	-
	Shenzen SE	-	-
	Singapore Ex	2000	2000
	Syndney Futures Ex	2000	2002
	Taiwan SE	1961	-
	Se of Thailand	2008	-
	Tokyo SE	2001	-
Europe•Africa	Amman SE	-	-
	Amsterdam SE	1997	-
	Athens Ex	1999	2000
	BME Spanish Ex	2001	2006
	Boras Italiana	1997	-
	Budaperst SE	2005	-
	Casblanca SE	2007	-
	Copenhange SE	1996	-
	Deutsche Borse	2000	2001
	Egyptian Ex	2004	-
	Helsini SE	1995	-
	IMKB(Turkey)	-	-
	Irish SE	-	-
	Johannesburg SE	2005	2006
	Ljubljana SE	2005	2005
	London SE Group	2000	2001
	Luzembourg SE	-	-

	Maurituus SE	2008	-
	MICEX-RTS	-	-
	NADAQ OMX Nordic Ex	1993	1993
	NYSE uronext(Europe)	2000	2001
	Oslo Bors	2001	2001
	SIX Swiss Ex	2002	-
	Tehran SE	2006	-
	Tel Aviv SE	-	-
	Warsaw SE	-	2010
North America •North America	AMEX	2001	-
	Bermuda SE	2007	-
	BM&FBOVESPA	2007	2007
	Burenos Aires SE	-	-
	CBOE	2006	2007
	CBOT	2005	2005
	CME Group	2002	2002
	Colombia SE	2001	2007
	InterContinental Ex	2000	2005
	International Securities Ex	2002	2005
	Lima SE	2003	2003
	Mexican Ex	2002	2008
	NASDAQ OMX	2000	2002
	NYSE Euronext(US)	2005	2006
	NYMEX	2000	2006
	Santiago SE	-	2000
	TMX Group	2000	2002

It seems that the degree to which the commercialization of exchanges has progressed is closely related to the level of capital market development in the region. Emprically[1], commercialization of the exchanges appears to occur a lot in countries where there is active competition due to high degree of political & economical freedom and high level of democratization. In the early days, demutualization of the exchanges is executed by exchange's volutary decision, but while demutualization streghten competion among exchanges, in recent years, there are many cases that the

1) Ramos (2016)

government and the regulatory authorities initiatively lead to demutualize and enlist exchanges within the economic policy system.

2 The Background of Demutualization and enlisting

The most important background for the exchange to promote the demutualization and listing is the competition intesifying within the exchange industry. While financial IT technology developd and ATS like ECN(electronic trading system) emerged, the physical importance of the exchange has weakened and liquidity competition between markets has begun. Electronic trading started in 1969 with the launch of Instinet and began to appear at the regular exchange in the late 80s, most regular exchanges introduced electronic trading systems at the latter half of 90s. ECN encroached the liquidity of the exchange armed with efficient systems, low transaction costs, transparent information, guaranteed anonymity, enlareged trading time and so on. ECNs such as Island, Instinet, ArcaEx, Tradebook, Brut, etc., grew to 45% in 2002 at the total portion out of stock trading. Competition among markets has expanded to an international level with liberalization of capital movement, and the increase of listing of foreign companies, and the commission income, commission fee, and information commission income has began to decrease.

The gradually growing influence of institutional investors is another important factor. Institutional investors continually requested low transaction costs and sophisticated trading services. Big brokers

provided services to match their orders and institutional investor orders, which reduced the commission that they had to pay to the exchange and dimished market impact. Big brokers emerged as another competitor of the exchange.

In this process, conflicts of interest among exchange members increased gradually. As interests among members became more complex with market diversification and complexity, tensions began to arise in the decision making process. This acted as an obstacle to rapid response to the change of competition environment. In addition, as the exchange's members became members of multi-exchanges, the importance of a particular exchange's membership and the interdependence among members gradually decreased. The original structure, memberships, has begun to be a situation that can no longer be maintained.

Each exchange felt the necessity for organization efficiency, achievement of economics of scale, trading system improvement, diversification of transaction products and new investment, restructuring, improvement of corporate governance, strategy of merger, acquisition and cooperation strategy are needed in order to steamline it. Since these strategies are not effectively realized in the form of unions, it seeked demutualization and enlisting of the exchange. The demutualization and enlisting of the exchange made financing from market and change of governance possible. In addition, it can improve administration efficiency by planing effective compensation system of business performance.

3 The Changes in Exchange Regulatory Functions

The reason why the exchange has regulatory functions is that it has high-expertisism and abundant experience thanks to close relation to the market, that is, it is the efficiency of regulation is high. However, the exchange's role as a public infrastructure with regulatory functions has become weaker along with the commercialization of exchanges and that of creating revenue by providing services has gradually expanded. The conflict of interests between the commercial goals and regulation functions of the exchange began to happen and it felt burden with fixed costs related to regulation function.

The conflict of interest between the commercial purpose of the exchange and the regulatory function can occur as follow perspectives: First, there is a conflict between profitability and publicity. To maximize profitability, regulatory functions causing only costs, not profit can be diminished. Of course, If the reduction of regulatory functions will lead to a deterioration in market quality, which can be rather lethal to profitability, so they do not let down the regulatory level. Or, it(the commodity is abolished it can not contribute to profitability or transition from free-of-charge of market information to charge) may cause the result against the public interest. Second is regulation differentiation. Regulation differentiation can be applied to members or listed companies that provide much revenue or have a special relationship with the Exchange. Third, it is the regulation about the exchange itself. If the exchange enlist itself, unfair regulation can happen because it take charge of listing and market surveillance.

Various methods for solving such problems are considered. In most cases conflicts of interest related to self-enlisting are easily solved by regulators' excution of enlisting examination or market surveilance. Various measures are used about other confricts depending on the level of intervention of the regulatory authorities.

The lowest level of government involvement is that seperating the functions to perform regulatory functions to specific organizaion or body, installing information blocking walls, establishing a committee to eliminate conflicts of interest or action guidelines, and expansion of internal audit function.

It also strengthens the supervisory authority of government regulators. They are as follow forms: Increase the government's authority over the governance structure of the exchange and management qualifications, control of regulatory functions' budget and personnel, and strengthening the oversight of regulatory procedures and regulatory changes. There is a case to restrict the exchange equity to block the exchange acquisition by specific person. If a specific person has dominant share, the regulatory function can be used unfairly or against the public interest. In the case of Hong Kong or Singapore, being proper to the public interest is regulated as an approval requirement for the establishment of exchanges or the demutualization.

There are some cases that the government block the conficts of interest by implementing directly the regulatory functions of the exchange. In this case, all regulatory functions are held by the

government in connection with enforcement and violation of current law and the exchange implement only limited simple supervision functions such as surveillance unrelated to current law.

As the largest exchanges such as NYSE Euronext and NASDAQ OMX including a lot of countries emerged, discussions on the regulatory functions of exchanges are expanding. The operation strategy of the ultra-large exchange is possible to affect the securities market of a certain country. Discussion on commercialized ultra-large exchanges' regulatory function and the exchange regulation is a situation included in the framework of international cooperation.

2. Exchange Industry's Business combination

As liquity competition among markets has begun due to capital market's volume expansion through securitization and institutionalization, increase in cross-border transactions coming from liberalization of capital movement, the emergence of an alternative trading system followed by financial IT technology development, the exchanges has propelled to be stock-companlized and to list. The stock-companliaed exchanges started agressively M&A, alliance.

① Purpose of combination

There are some theoretical discussions that explain why the

exchange try to M&A(merger and acquisition). The first is Efficiency Theory. In the efficiency theory, it is said that the goals of mergers and acquisitions between exchanges are financial synergies, operational synergies, managerial synergies. Financial synergy means that lowing the company's systematic risk through business diversification, expanding the scale of company, and lowing the capital cost by utilizing internal-capital market. As a commercial enterprise, the exchange pursues financial synergy to respond to deteriorating profitability and expanding investment demand.

Operational synergy is to achieve economies of scale, and economies of range. The exchange seeks to realize economies of scale and economies of range by integrating the exchanges horizontally or by integrating settlement organizations, investment information companies, financial IT companies, etc. in order to reduce services cost and diversify services. This means diminition of transaction cost and can be connected to pro-cycle like liquidity expansion and improvement of profitability of exchanges. Furthermore, strengthening the price discovery function of the market, maximizing the diversifying effect of the portfolio, and reducing the capital procurement cost of the enterprise, etc.

Management synergy means management efficiency through the acquisition of management know-how or change of ownership structureis. In the course of merger and acquisition, management know-how is shared and management ineffiency can be reduced while manpower is re-arranged as centered good personnel.

The second is Network Externality Theory. In this theory, the factors of merger and acquisition are seeked at the externality of the exchange industry network. Network externality means that the more demanded products and services the more demand increase, which has characters that beyond a certain level of demand the demand explosively increased. The exchange industry typically has a network externality. Increase of listed companies brought investors and brokers to increase and the increase of investors brought the number of potential listed companies and brokers to increases. If liquidity increases, the system improves and transaction costs lowers, which lead to an increase of listed companies and investors, and an increase of liquidity. If the exchanges exposed to competitive environments do not have a certain level of listed companies and investors, they can be kicked out of the market. Therefore they pursue enlargement through mergers and acquisitions. The theory of efficiency and network externality theory are finally the principle of exchange natural monopoly and the core argument for promoting the domestic integration of the exchange.

The third is the Resource Based View. From a resource-based point of view the companies that have the most appropriate and rare and irreplaceable resources can be considered the most successful companies. Intangible assets such as reputation and tradition out of the exchange's asset can not be easily copied and can be seen as a resource that does not disappear. Small and medium-sized exchanges seek to establish a new position through integration with traditionally large exchanges. The M&A trend of smal and medium-sized exchanges with centered big exchanges such as NYSE, NASDAQ, and Euronext can be understood from

this viewpoint as well.

In addition, other than the economic factors such as efficiency and competition, there is an institutional theory that mergers and acquisitions take place in the process of conforming to systematic environment and norms. According to institutional theory, if the exchange which is lack of operational capability faces with the uncertainties of environmental change, it choose to mimic the consolidation and alliance of some large exchanges. It responds to uncertainty by simply responding to social pressure or time flow.

It can not be overlooked that integration between exchanges can cause costs. The exchange is regulated by the government because the exchange has a character of a public infrastructure, while it usually has self-regulation function. Therefore, there is accompanied cost to overcome institutional or regulatory difference and for cross-border integration, the cost is higher. In the integration process, coordination is required in relation to provisions of listing, trading, disclosure, market surveillance, membership structure, clearing and settlement and difference of accounting standards, tax system, and foreign exchange should also be overcomed. The effect of integration may be limited because of information asymmety caused by cultural, linguistic and geographical differences among countries. Therefore, it is easier to integrate within the region rather than intercontinental integration. This is confirmed in the situation at the development of business combination in the exchange industry.

2 Situation of business combination

In this chapter, we will look at the combination of the world. Each combination case is classified M&A, equity transactions · joint ventures, and partnerships. Partnership is the weakest level in combination and equity transactions to acquire a minority stake and a joint venture that the two oargniazations seek to new business is considered middle level of combination. We regard the Merger & Acuquisition as the strongest combination.

Each combination case was classified by type and region. Institutions within the exchange industry are classified into 'stock market', 'other market', 'back-line business', and 'information technology'. 'The stock market' is a stock exchange that trades stocks and even if it trades goods other than stocks or has liquidation and settlement mechanisms, it is classified as stock market. 'other market' refers to the futures · options market, the bond market, the real commodity market, and the foreign exchange market. 'Back-line business' means an institution that has functions such as clearing, settlement and deposit. 'Information Technology' refers to companies that process and sell market information and IT companies related to the exchange industry. By region, it is divided into 'domestic' and 'international', and it is classified by the standard whether it was done within a specific country. Here, it can be seen as a horizontal combination that occurs within each type of subject such as combination between the markets and backward business, information technology. Combination such as between market and back-line business and market and IT information can be seen as a vertical combination.

Based on these classification criteria, the combination cases can be summarized on the below table. During the survey period, 42 mergers and acquisitions between stock markets occurred, in which there are 23 domestic cases and 19 international cases. The representative cases of international M&A are as follow: Euronext (2000) of combination among Amsterdam, Brussel and Paris exchanges, LSE and Borsa Italiana merger (2007), NYSE (New) York Stock Exchange) and Euronext (2007), M&A between NASDAQ and OMX (2008).

The acquisition and merger between the stock market and other markets are 13 cases in domestic and 9 cases in international markets. The merger and acquisition among other markets takes place in 12 domestic and 5 international. Mergers and acquisitions between stock market and other markets are Euronext's LIFFE (London International Financial Futures and Options Exchange) acquisiton and Merge between Brazil's Bovespa (Bolsa de Valores, Mercadorias &Futuros de São Paulo) and BM &F (Brazilian Mercantile and Futures Exchange). The representative examples of combination among other markets are merge between CME (Chicago Mercantile Exchange) and CBOT (Chicago Board of Trade merger, and merge between international Securities Exchange (ISE) and Eurex (2008).

In Europe where a number of densely populated countries form a single market, cross-border integration happen very often, and in the case of North America, there is a combination trend between large exchanges such as NYSE, NASDAQ, TMX and etc. In Asia,

There are many cases of domestic integration rather than cross-board integration. The domestic integration happened in Singapore(Merge between Stock Exchange of Singapore and Singapore International Monetary Exchange), Hong Kong(Merge among Hong kong Stock Exchange, Hong Kong Futures Exchang, Hong Kong Securities Clearing), Japan(Merge among Hiroshima Stock Exchange, Miigata Stock Exchange, TSE), the Philippines(Merge between Manila Stock Exchange and Makati Stock Exchange), Korea(Merge between Korea Stock Exchange and Kosdaq), Taiwan(Merge between ROC over-the-counter Securities Exchanges and TWSE) and Malaysia(Merge between Kuala Lumpur Stock exchange and Mesdaq). In each Asian market, there is still a large gap in quality and the level of integration or incompatibility economically and institutioally is so low that there is little cross-border integration.

In equity transactions and joint ventures, domestic cases are 16 cases, while international cases are 54 cases. In case of partnership, 20 domestic cases, while international cases are 336 cases. That international cases are bigger shows that each market is actively using joint venture or partnership prior to the full-scale integration in order to highten connection to foreign markets. Partnership is mainly performed horizontally between exchanges, and equity transactions are conducted between the exchanges and the lower level organization.

< Classification of Exchange Industrial Business Combination >

Type	combination main agent	stock market	other market*	back-line business	information Tech	Total
A. Domestic						
M&A	stock	23	13	5	17	78

	market					
	other market	-	12	0	6	
	back-line business	-	-	2	0	
Equity Transaction	stock market	1	5	4	5	16
	other market	-	0	0	1	
	back-line business	-	-	0	0	
Partnership	stock market	2	6	1	4	20
	other market	-	6	0	1	
	back-line business	-	-	0	0	
B. International						
M&A	stock market	19	9	4	26	70
	other market	-	5	0	0	
	back-line business	-	-	5	2	
Equity Transaction	stock market	24	12	5	9	54
	other market	-	3	1	0	
	back-line business	-	-	0	0	
Partnership	stock market	198	43	7	15	336
	other market	-	55	3	2	
	back-line business	-	-	13	0	

* other market includes derivatives other than stocks, real products, bonds, foreign exchange, etc. And the back-line business includes clearing, settlement, Related organizations, information technology includes the production and distribution of financial information, financial IT And technology and consulting firms

The strength of the combination appears to differ from region to region. According to the below table, out of total business combination cases, the proportion of North American institutions included in the business combination is 54% for merge, 54% for

equity transaction, 27% for joint venture. The European cases are 61%, 59% and 39% respectively. North America and Europe organizations are involved in a strong level of combination.

The Asia cases have wholly different from the USA and EU. Asian institutions show that 16% for mergers and acquisitions, 33% for equity transactions · joint venture and 70% for partnership, which means the weaker level compared to the USA and EU. The cases that institutions in South America and Africa are included in the business combination are rare. This result shows that the trend of mergers and acquisitions in the exchange industry is closly related to the development level and open level of capital market. Since the weak level's combination spread very fast, if the competition among markets began to start mainly, the strong level's combination will increase.

< proportion of business combination in exchange industry by reagion(%) >

	M&A	equity transaction. Joint venture	partnership
North America	54	54	27
Europe	61	59	39
Asia Pacific	16	33	70
Latin America	3	4	6
Africa	0	0	2

If we look at the cases of business corporate mergers by year, since 2006, 10 to 20 cases have occurred every year. Equity transactiong · Joint venture and partnerships have continued to increase since 2000, peaking in 2007 and after it is in a downward trend. We can see that, between 2006 and 2008, 38% of mergers

and acquisitions, 53% of equity transactions and joint ventures, 41% of partnerships happened intensively, which is the time Reg NMS and MiFID were introduced and is time for the competitive environment to change drastically. It is inferred that the combination of exchanges is processed in a dimension to respond the change of a competitive environment finally.

< The yearly trend of business combination of exchange industry >

year	M&A			Equity Transaction Joint Venture			partnership			Total
	domestic	international	section total	domestic	international	section total	domestic	international	section total	
2000	3	3	6	0	0	0	0	11	11	17
2001	2	2	4	0	1	1	0	11	11	16
2002	6	4	10	1	4	5	2	9	11	26
2003	2	4	6	1	3	4	5	26	31	41
2004	5	3	8	3	1	4	4	0	32	44
2005	6	1	7	1	2	3	2	39	41	51
2006	10	6	16	3	5	8	2	45	47	71
2007	12	7	19	4	17	21	3	60	63	103
2008	9	12	21	2	6	8	3	34	37	66
2009	4	7	11	0	5	5	0	0	0	16
2010	3	7	10	1	3	4	2	25	27	41
2011	7	6	13	0	4	4	1	26	27	44
2012	9	8	17	0	3	3	0	18	18	38
Total	78	70	148	16	54	70	20	336	356	574

NASDAQ mergers and acquisitions' situation is as follow: NASDAQ, founded in 1971 and listed in 2002, first acquired Brut ECN in 2004. After that, it timely acquired Inet ECN in 2005 and Shareholder.com, Investor Relations (IR) companies and PrimeZone

Media network, news and multimedia provider in 2006 and Directors Desk in 2007. Since its transition to the regular exchange in 2008, by mergering 3 countries, 3 Baltic countries, OMX which consists of eight countries' exchanges such as Armenia Stock Exchange, Iceland Stock Exchange it became the cross-boder atlantic exchange. In the same year, it mergered the Boston Stock Exchange and Philadelphia Stock Exchange. After that, it has continuously pursued to M&A strategy by mergering Financial IT companies such as Bewise, RapiData, FTEN, and SMARTS, and the International Derivatives Clearing Group (IDCG).

3 Combination Performance

If we checked the difference in sales compositon before and after actively participation in mergers and acquisitions. For NASDAQ OMX, before 2004, sales composition was 62% for trading, 38% for issuance, but in 2011, trading was 84% and issuance was 11%, so that, trading ratio increased tremeduously. For NYSE Euronext, stock trading's share which was only 11% in 2004 increased to 46%. Derivative maket's profit, not existing in 2004 was 23% in 2011. On the other hand, the profits from listing and information declined and the liquidation and settlement profits disappeared.

For LSE, in 2006, portions of three business units including listing, stock trading and information technology was 95% of the total, but in 2011, that portion declined sharply to 58%, which liquidation and settlement at 28%, trading of derivatives at 6%, other securities trading at 6% replaced it. It is said for the LSE to achieve vertical integration or diversification of services through the combination

with Borsa Italiana in 2007. The TMX case is similar. While the share of stock-bonds in 2004 reduced from 38% to 16% in 2011, the proportion of derivative that did not exist in 2004 has reached 17% in 2011.

As the purpose of merger and acquisition in the exchange industry reduction of systematic risk through diversification of businesses, economies of scale and economies of scope, network externality were mentioned, the change in the sales composition of the major exchanges reflected those purposes.

Below table shows that how the top 30 exchanges of the market cap in 1996 and 2011 has changed between 1996 and 2011. 26 exchanges out of the top 30 exchanges in 1996, are combined into 18 exchanges and are included within 30. In 1996, the first, seventh, twelfth, 23rd and 25th, NYSE, Paris Stock Exchange, Amsterdam Stock Exchange, Brussels Stock Exchange, AMEX are incoporated into NYSE Euronext and ranked 1st in 2011. In 1996, fifth, seventeenth and 29th, NASDAQ, Stockholm Stock Exchange, Copenhagen Stock Exchange ranked third in 2011 with integration into NASDAQ OMX. The LSE Group, which was combined LSE the 4th place in 1996 and the 16th ranked Borsa Italiana, ranked sixth in 2011.

If you divide the exchanges included in the 30th place in 1996 by region, 10 europe, 10 in Asia, 7 in North America, 2 in South America, and 1 in Africa, while in 2011 15 in Asia, 9 in Europe, 3 in North America, 2 in South America, and 1 in Africa. Many of the North American and European exchanges that were included in

the top 30 in 1996 disappeared in the process of integration and emerging market exchanges in China, India and Russia are newly ranked in 2011. Newly appeared. China's SZSE and SSE, which were not in 1996, ranked 2nd and 4th, India's NSE and Bombay Stock Exchange ranked 7th and 22nd, MICEX, Warsaw Stock Exchange and RTS Stock Exchange respectively ranked 8th, 20th, 21st. On the other hand, big exchanges like Tokyo SE, Deutsche Börse, and Chicago Stock Exchage have fallen sharply in 2011 rank.

< The Top exchanges Change >

1996		2011	
rank	name	name	rank
1	NYSE	NYSE Euronext	1
7	Paris SE		
12	Amsterdam SE		
23	Brussels SE		
25	AMEX		
below 30	Shenzhen SE	Shenzhen SE	2
5	NASDAQ	NASDAQ OMX	3
17	Stockholm SE		
29	Copenhagen SE		
below 30		Shanghai SE	4
9	Hong Kong Ex	Hong Kong Ex	5
4	London SE	London SE Group	6
16	Borsa Italiana		
below 30	National SE of India		7
below 30	MICEX	MICEX	8
21	Singapore EX	Singapore Ex	9
20	Spain	BME Spanish Ex	10
6	Deutsche Borse	Deutsche Borse	11
2	Tokyo SE	Tokyo SE	12
8	Toronto SE	TMX Group	13
11	Montreal SE		
19	Brazil	BM&FBOVESPA	14

13	Australian SE	Australian SE	15
27	Jakarta SE	Indonesia SE	16
15	Taiwan SE	Taiwan SE	17
14	Kuala Lumpur SE	Bursa Malaysia	18
26	Thailand SE	Thailand SE	19
below 30	Warsaw SE	Warsaw SE	20
below 30	RTS SE	RTS SE	21
below 30	Bombay SE	Bombay SE	22
below 30	Gretai Securities Market	Gretai Securities Market	23
22	Korea Ex	Korea Ex	24
18	Johannesburg SE	Johannesburg SE	25
below 30	Istanbul SE	Istanbul SE	26
below 30	Luxembourg SE	Luxembourg SE	27
below 30	Oslo bors	Oslo bors	28
30	Santiago SE	Santiago SE	29
below 30	Osaka SE	Osaka SE	30
3	Chicago SE	Chicago SE	below 30
10	Switzerland SE	SIX Swiss Exchange	below 30
24	Mexican Exchange	Mexican Exchange	below 30
28	Philippine SE	Philippine SE	below 30

* Source : WFE

A number of empirical studies on the integration of exchanges have also been presented. Nielsson[2)] analized in the 2008 paper that how the launch of Euronext effected the stock liquidation and how the effect differed according to the characteristics of the listed company. As a result of the analysis, it was assured that the liquidity of listed companies or oversea business has increased. In small business or domestic only business there was no significant change in stock liquidity and there were no differences according to industry or listed countries. Also, cross transactions within Euronext

2) Nielsson (2008)

have increased significantly. The transaction companies listed in Amsterdam share of members of Brussels, Lisbon and Paris was 19% in 2011, but in 2004 it increased nearly threefold to 56%. Nielsson concluede that Euronext integration brought about Pareto improvement. Due to the nature of the European market, information asymmetry between markets seems to have had a significant impact on the positive outcome, and it should be noted that positive effects have been concentrated on big companies.

Pownall, Vulcheva, and Wang[3] analized the effect of exchange consolidation on the quality of accounting information and liquidity based on the same Euronext case. In this study, previously listed companies have shown improved quality and liquidity in accounting information.

Fang, Francis, Hasan, and Song[4] analized that the effect of a structural characteristic of the exchange network to the liquidity of the exchange. They defined that the strenght of inter-exchange network are listed from M&A, Joint venture, partnership and the strenght of technology integration are defined in the order of system integration, system co-operation, common system, cross-access. As a result, ① located in the center of the network, ② the market size is large, ③ the technical integration degree is high, ④ geographically dispersed networks, and ⑤ the trading commodity has diverse network, the liquidity is larger. This showed that network strategy is an important competitiveness factor of the exchange.

3) Pownall, Vulcheva, and Wang (2010)

4) Fan, Francis, Hasan, and Song (2010)

IV. Changes in the regulatory environment

1. US regulatory environment change: Reg NMS

Reg NMS is an integrated regulation system of abolishment of anti-competition regulation and the introduction effort for effective market structure that the SEC has been pursuing since the Securities Exchange Act of 1975.

The introduction of Reg NMS dates back to the Securities Exchange Act of 1975. As the institutional investor's mass market moves to low exchange commissions the problem of market segmentation emerged. and then overall review about the stock market structure began by the US Congress. As a result, the Securities and Exchange Act was amended, five policy goals (① hightening efficiency of stock sanction ② establishing a fair competition system among markets ③ strenghtening access to market information ④ realization of best execution ⑤ facilitation of direct transactions between investors) were established.

After that, step approaches were taken to achieve these goals. Respectively, Consolidated Trade System (CTS) in 1976 and Consolidated Quote System (CQS) in 1978 was introduced. ITS (Intermarket Trading System), a system for forwarding orders for NYSE and AMEX listed stocks between exchanges was introduced in 1981.

The OHR (Order Handling Rule) and ECN Rule introduced in 1997

significantly lowered transaction costs for NASDAQ and made an important role to facilitate ECN growth. In OHR, if a favorable quotation of general-purpose investors than market maker was received, the market maker will replace his quotation to general-purpose investors within 30 seconds. In the ENC, the market maker can not pos the ECN any quotes other than those quoted on NASDAQ. These two provisions allow NASDAQ to engage and transaction in market and make all access to best execution of maket maker.

In 1998, the Securities and Exchange Commission (SEC) introduced Reg ATS (Regulation Alternative Trading System) to regulate alternative trading systems effectively and to ensure that they continue to pursue innovation. Reg NMS is on the verge of a series of regulatory changes over the past 30 years, which promotes competition within the market and thereby hightens market liquidity and efficiency.

SEC enacted The Reg NMS in June 2005 and executed step by step until in October 2007. In Reg NMS, all tranaction platforms concluding regular exchange as well as ATS, IB were considered as a market, which was open and transparent and closely mutually linked.

The Reg NMS is composed of key four provisions, "Order Protection Rule", "Access Rule", "Sub-penny Rule "and" Market Data Rule ".

Order Protection Rule is Rule improving the existing Trade-Through Rule to gurantee the best contract for all listed stocks in the US. If the quotation is posted in any market, it is imperative to return the order for the order to be placed at the best bid price and the subject is limited to the automated quotation which instant transaction is possible.

Access Rule is the rule that allows all investors to access non-discriminatorily and fairly best quotation protected by Order Protection Rule. Orders submitted directly to the market, or orders returned from other markets must be treated equally and for access to quotations you can not charge a fee of $ 0.003 or more.

The Sub-Penny Rule is a regulation that prohibits posting or accepting a quotation as a unit of price less than $ 0.01 ($ 0.0001) for a quotation of $ 1 or more.

Lastly, **Market Data Rule** is a regulation that the allocation of information commission incometo should be based on contribution to the market in order to effectively integrate, distribute and provide market information.

After Reg NMS implementation, competition between markets for order flows became even more intense. The stock trading volume of the NYSE as a regular exchang dropped from 33.55% in 2008 to 22.39% as of September 2012 and NASDAQ also saw a sharp decline from 27.09% to 15.23% over the same period. On the other hand, Direct Edge, which was established as ATS and converted to the current exchange and BATS currently accounts for 9.78% and 12.81% of transactions, respectively.

< Transaction Share ratio of transaction platform in USA(unit: %) >

market	2008	2009	2010	2011	2012
NASDAQ	27.09	18.85	16.04	17.33	15.23
NYSE Area	18.01	12.59	12.93	12.23	11.47
NYSE	15.54	14.91	13.78	13.00	10.92
BATS BZX	10.36	9.22	8.19	8.70	9.19
EDGX	-	-	4.99	6.67	7.33
BATS BYX	-	-	1.35	2.46	3.62
EDGA	-	-	4.42	3.06	2.45

* Source: BATS

With less than 10 years of established, the fact that Direct Edge and BATS are on the shoulder side to the regular exchange is evaluated that the framework of competition between markets created by Reg NMS played a big role. These alternative systems has growed market shares successfully while implementing demand of a variety of trading services for institutional investors sensitive to transaction costs based on advanced technology. Technological development led cost to build a trading platform lower and has become easier for investors to access various markets. If only providing the best price, since Reg NMS's best-practice transaction principle is able to attract as much liquidity as possible, the logic(liquidity follows liquidity) of monopolization of traditional exchanges has weakened. Newly-emerging alternative trading systems rapidly aborb liquidity through new commission systems such as cheap fee, high-speed trading system.

Cmpetition between markets by the Reg NMS had a great impact on the trend of mergers and acquisitions within exchange industry.

To cope with the competition, there are efforts such as expanding the business are by integrating between the stock market and the derivatives market or reducing service costs by integrating clearing and payoffing organization. There are cases of M&A existing ATS to obtain electric transaction system technology.

2. Changes in regulatory environment in Europe: MiFID

MiFID(Markets in Financial Instruments Directive) is the regulatory regime system aiming to establish a single regulatory system in the European stock market and to achieve the conclusion and strengthen the level of investor protection. MiFID was introduced in 1993 for the integration of the European financial services industry to overcome the limitations of ISD(the Investment Services Directive).

The EU's efforts to form a single market began in the 1980s and ISD is at the core. ISD accepted the single-passport system, so if an investor obtains permission from one country he can do business freely in all EU counrtries. It is evaluated as an important progress to create a single market. However, at the same in ISD each country is able to establish Concentration Rule that listed stocks can be traded only on that exchange. This provision was introduced in order to prevent the deterioration of liquidity due to market segregation, but it it has become a factor preventing the formation of the one-single stock market. According to this, a need for a new regulatory system that can promote the integration of the EU financial services industry, improve the quality of the markeactively

and cope with various changes emerged and MiFID was introduced in November 2007.

MiFID has key contents as follow: Elimination the need of exchange concentration, ensuring the best execution, enhancing trade transparency. To be more specific, ① harmonization of the EU member states' system to raise the level of investor-protection, ② revision of quotation-related provisions to ensure consistency within the EU capital market, ③ gurantee of best execution, ④ enhancing market transparency, and ⑤ improving the soundness and efficiency of the financial system.

In MiFID, investors are required to take all methods to make the best possible order execution. Investors should establish a policy for the best possible order execution and prove that they have taken all possible action for best execution.

MiFID is asking all types of markets to disclose over some level of pre · post market information to maintain market transparency and reduce the negative effects of market segmentation. Each market should disclose a range of quotations and quotes and disclose the closing date, the closing price, and the transaction quantity of all trades in accordance with post-trade transparency regulations.

MiFID also liberalized the information market. Regulated market, MTF, SI should disclose information about price, volume, execution by the real-time method and that information can be processed and sold in accordance with reasonable commercial standards.

< Three markets in MiFID >

- Regulated Market: licensed and supervised exchange by EU member states
- MTF(Multilateral Trading Facility): multilaterral trade system operated by regular market or investmentors under the approval of the EU Member States.
- SI(Systematic Internalizer): similar to ATS in USA

After the implementation of MiFID, there has been a similar change like the US market in the European market. MTF and SI quickly eroded the regulated market based on high-performance trading system, various execution mechanism, and cheap transaction cost and the market share of equity trading volume of exsiting regulated market fell to around 58% in August 2012. The volume of trading volume of BATS Chi-X Europe, the most representative alternative trading system in Europe is 33%, the largest in Europe and nearly double the LSE Group. Another alternative trading system, Turquoise, has a trading volume share of 8.15% , almost close to that of Deutsche Börse. In addition, there are also active transactions in the alternative trade system such as Equiduct, TOM MTF, Burgundy, etc., and UBS MTF, Sigma X MTF etc.

Transaction Share ratio of transaction platform in EU(unit: %)

market	2008	2009	2010	2011	2012
LSE Group	27.73	20.77	15.97	14.84	17.49
NUSE Euronext	20.70	17.83	15.17	12.87	13.20
Deutsche Börse	14.50	8.63	8.70	8.13	8.54
Truquoise*	3.80	5.17	4.54	7.72	8.15
BATS Europe*	1.23	6.59	8.38	7.30	33.12

* alternative trading system (Source: FESE)

It has been evaluated that competition among European markets met the diverse needs of investors and reduced transaction cost. Unlike the US, however, since there are not systems that manage market transparency and a physical network between markets it can be possible that the market quality's deteroration due to market fragmentation and liquidity declination.

Reg NMS and MiFID, which appeared at similar times, recognized various kinds of trading-flatform as a market. In Reg NMS, recognized OTC, ATS, IB, etc., as a market other than regulated market and MiFID accepted the establishment of the exchange by the IB while abolishing the duty to concentrate on the exchange. Reg NMS and MiFID basically target to promote the market liquity and efficiency by enhancing competition between these markets. These commonly gurantee the best order execution and maintain market transparency and establish unified rules across markets and strengthen the level of investor protection.

While there are aspects that the United States lead to change, Reg NMS and MiFID are similar at the aspect of impact on the US and European stock market. Since various trading platforms other than the regular exchange are formed and competing, a variety of services related to trading are provided and transaction costs are decreasing. In addition, high-level IT is rapidly penetrating financial industry.

The object of the competition between markets is liquidity, and the power of moving liquidity is the best execution and the things that makes the best execution possible are transparent market information and advanced information technology. This is a core principle that a physically segmented market is virtually integrated and a vision of a change in the stock market regulation that has long been established by the United States and Europe.

V. Influence of technological innovation

1. Alternative trading system

The alternative trading system is a trading platform other than a real exchange to be made for the purpose of trading securities between buyers and sellers. Usually, it does not have function other than trading services(for example, a listed exchange or a member regulation function). In the early days, it appeared as an electronic trading system for selling off-the-shelf stocks. It has become bigger as a formal market for trading regular stock through regulatory changes. With low fees, high performance systems, and new trading machanism it(ATS) has replaced regular trading system and has completely changed the topography of the exchange industry by encroaching rapidly the liquidity of existing the regular exchanges. This trend are spreading not only in stock trading but also in derivatives, bonds, and foreign exchange transactions.

① Overview of Alternative Trading Systems

In the US market, the official name of the alternative trading system is ATS (Alternative Trading System), which is defined in Reg ATS. ATS ① set up, manage, and provide a market or organization to collect seller and buyer of securities in one place and ② is an organization, partnership, individual, system that does not conduct discipline other than things to exclude from the transaction. The SEC introduced Reg ATS in 1998 to protect investors from problems that may arise from trading on trading

platforms other than reular exchanges. In the case of the transaction volume reach the some level, SEC allowed them to switch to regular exchanges while it imposed strict report duty of trading information.

ATS is classified as ECN, Darkpool and Crossing Network. ECN is a fully automated trading system that provides pre-transparency and post-transparency as the same level of regular exchanges. This is the same as the electronic trading system used for now. Instinet, founded in 1969 was the forefather of ECN. Darkpool is a trading system or deal-execution method with low pre-transparency and post-transparency. Since it has low level of disclosure of pre-transaction and post-transaction information, massive traders mainly use it to avoid exposure of trade information and to avoid market impact costs. Generally, commissions are low and it its more advantageous in terms of price because price is decided between regular market top priority buying price and the first selling price or the average closing price at the specific time period. Crossing Network to Order is a non-disclosure market that order is executed by an electronic-trading method. It is not much different from Dark pool since anonymity is guaranteed and market impact can be avoided. Darkpool is a name to emphasize conceptual aspect and Crossingnetwork is understood as a name to point out technical · phisical aspect.

In the US, alternative trading platforms other than regular exchanges are all called ATS, while in Europe, it is defined in more detail. First, MTF is a multilateral trading system to execute buying and selling according to non-discretionary rules, that is,

established trading rules. It can be established by an investor or a regular market operator. In case of regular market, investors cannot establish it and is usually limited to domestic market transactions, while investors can establish MTF and it provide cross-Europe transaction. MTF with low pre-transparency and post-transparency using non-disclosure orders out of MTF is called dark MTF. Dark MTF usually uses the reference price method rather than competition trading method. In other words, rather than discovering prices through competition between orders, it trade by using the median of the first buying and selling price formed in the regular market or the average market closing price for a specific time-period. In this way, since MTF is exempted from MiFID′s pre-transparency requirements, it can have the characteristic Dark MTF. The general MTF, not the Dark MTF, is very similar in terms of market structure and operational aspects with regular market, which offer price and execution information is released in real time.

SI is defined as another alternative trading platform in Europe. SI refers to investors who execute trading in a frequent and systematic way other than the MTF or regular market. The difference from the regular exchange or MTF is that SI is not a multilateral trading but a bilateral trading. SI is operated as a call-driven type by nature, which it tells you the price and quantity you can trade, and if your order is not executed that order returns to the regular market or MTF. SI′s trading results reported as OTC transaction, and when transaction volume exceeds certain level, offer price should be disclosed.

Transactions not in regular market, MTF, SI are not regulated in MiFID and are considered as OTC transactions. In here, some crossing networks or brokers dakpool are included. Crossing network are operated by investment bank or broker, which a systematic system allows customers to execute their orders with other customers. Price is decided by only negotiation and limited customers can access it, therefore the transparency level is very low. It is not classified as MTF or SI in that it is operated in a discretionary rule, not in competitive sale or reference pricing method and it is a bilateral deal but is not necessarily interalized.

Let's explain trading methods after and before the emergence of the alternative trading system. In the past, buyers or sellers may submit the order to the intermediary and the intermediary submit the order to the regular exchange, then the transaction was made. Since the exchange has a monopolistic position, investors or brokers have little or no room to choose the exchanges. On the other hand, for now they can choose buy-side darkpool before committing orders to the intermediary. If institutional investors made deals in a buy-side darkpool, they can reduce commissions and avoid market impacts and avoid exposure to trading strategies. If it is not easy in buy-side darkpool, the order will be entrusted to the intermediary. The intermediary can submit orders after choosing and selecting the most favorable trading platform out of crossing network, darkpool, ECN, the regular exchange that provides different execution mechanisms, transparency, and order types. If the transaction is not made in the alternative trading system, the order may be returned to other regular markets or alternative trading systems. Investor, intermediary and the trading platform are all electronically connected, and the order execution process are mostly automated.

2 Situation of alternative trading system

Below table shows trend of the trading volume share of the alternative trading system by region. In the United States, where alternative trading systems have long been widespread since 2008, it has maintained a steady share of around 30%. It seems that stable market split of the stock exchanges and alternative trading systems has formed and been maintained. The share of Europe in the first quarter of 2008 right after adopting MiFID was only 1.96%, but it reached 27.36% in the second quarter of 2012. Canada has a similar pattern to that of Europe, which the market share was only 0.77% in 1Q of 2008, but soared to 37.64% in 2Q of 2012 after only 4 years. As shown in North America and Europe, Alternative Trading System (ATS) seems to have considerable competitiveness. In Japan, it expanded from 0.25% in the first quarter of 2008 to 4.63% in the second quarter of 2012. Although it has a not so small proportion, it has not reached the growth rate of Europe or Canade.

< trend of the trading volume share of the alternative trading system by region(unit:%) >

	Europe	Canada	Japan	USA
08.1Q	1.96	0.77	0.25	-
08.2Q	4.25	1.30	0.27	-
08.3Q	7.57	2.17	0.45	29.36
08.4Q	10.67	3.48	0.39	21.85
09.1Q	13.69	8.41	0.47	25.17
09.2Q	15.17	13.39	0.71	30.05
09.3Q	18.30	19.59	0.89	30.88
09.4Q	19.78	26.59	0.85	33.27
10.1Q	22.28	33.62	0.45	33.22

10.2Q	23.72	33.15	0.71	30.94
10.3Q	24.61	33.37	0.96	26.99
10.4Q	23.50	35.70	1.47	29.87
11.1Q	24.64	37.69	1.87	27.85
11.2Q	24.49	39.70	3.54	26.83
11.3Q	29.07	39.22	4.01	25.54
11.4Q	28.79	38.59	4.98	29.21
12.1Q	27.85	37.64	4.32	28.21
12.2Q	27.35	-	4.64	27.25

A) ATS in the USA

The most representative ATS in the United States are BATS and Direct Edge. BATS was founded in 2005 as ECN. Equipped with advanced trading systems and aggressive commission system it rapidly increased its share of the stock market, exceeding 10% in early 2009. BATS moved from ATS to the regular exchange in November 2008, which it operates two markets, BZX and BYX. It entered the European market in 2008 by establishing BATS Europe MTF and began to deal about the option trading and enlisting business in 2010. In 2011, it acquired Chi-X Europe, Europe's largest MTF and launched BATS Chi-X Europe and secured Europe's largest trading volume. As of 2012, US market share is about 13% and it has become the third largest US exchange after NYSE Euronext, NASDAQ OMX. Citigroup, Morgan Stanley, Credit Suisse First Boston, Bank of America are major shareholders.

< ATS situatation in the USA >

	System
ECN	LavaFlow, Chi-X, Canada, Omega, Pure Trading,

		TMX Select
Dark pools	Block Cross	Liquidnet, BIDS, Instinet Cross, NYSE MatchPoint
	Continuous Cross	CrossFinder(Credit Suisse), SIGMA X(Goldman Sachs), LX(Barclays), SuperX(Deutsche Bank), MSPool(Moran Stanley), Knight Match, UBS ATS, LeveL ATS, Citi Match, Milennium(ConvergEx), VortEx(ConvergEx), Midpoint Match(Direct Edge), MATCH Now(TriAct), Instinet Canda Cross, SIGMA X Canada(Goldman Sachs)
	Liquidity Provider	Knight Link, GETMatched(Geto)

Direct Edge began in 1998 as ECN named Attain, it changed now known as Direct Edge while it was acquired by Knight Capital Group. Until 2008, it accounted for less than 5% of listed stock trading in the US, but in 2009 it grew rapidly and occupied more than 10% of the market share. Following BATS, it switched to a regular exchange in 2010 and has operated two EDGA and EDGX markets, which is the fourth largest US exchange. ISE is the largest shareholder and Knight Capital Group, Citadel Derivatives Group, Goldman Sachs Group are major shareholders.

Alpha is the Canada's leading alternative trading system founded in 2008. The Canadian stock market was in fact the monopoly structure of the TMX Group, but after the emergence of Alpha it encroached the market and Alpha's stock trading market share reached 21% as the end of 2011. Alpha switched to a regular exchange in the second half of 2011 and as Maple Group Acquisition Corporation acquired TMX Group and Alpha in late 2011, it became a subsidiary of TMX Group. In Canada ENC such as Chi-X Canada, Omega, Pure Trading, and TMX Select are operated.

As of 2012, there are 89 ATSs registered with the SEC, most of which are Darkpools. Before 2005, Darkpool's share was very little. However, as the regulation to protect the manual order of the regular exchange was eliminated by the Reg NMS, alternative trading systems can easily gain liquidity and mass-traders sensitive to anonymity and price shock after the call-unit was decimalized demanded a lot for Darkpools. Meanwhile, since regular exchanges with significantly lower market share already have advanced systems and low commissions, it became difficult to directly compete with the regular exchanges as entering by the ECN type. Therefore, the number of Darkpools which have room to pioneer the new markets through the new type of services increased.

Investment banks that already have large customer class are aggressive to establish Darkpools, so CrossFinder, SIGMA X, LX, Super X, MSPool, UBS ATS, Citi Match are Darkpools owned by the investment bank itself. There are also cases in which existing Exchanges establish directly in order to enhance competitiveness. The examples are NYSE's MatchPoint and Direct Edge's Midpoint. DarkPools, like ECNs or regular exchanges, are mostly automatedly operated.

The shape of the Darkpool is classified as Block Cross, Continuous Cross, Liquidity Provider type. Block Cross is a method that deal is made by a non-continuous way, which means that deal is executed a fixed time or when a trading partner appears. Contract prices are the negotiated price or median value within the highest buy bid and the highest sell bid usually formed in regular markets. Continuous

Cross is doing competition trading by using limit order book, but does not disclose a limit order book. Since the market operator also submits orders and executes orders, internalization occurs. Liquidity Provider is the form which the market operator becomes the countpartner of all deals. Not executed by a certain rule about incoming orders, but it is simply operated in a way that a market operator does not execute or execute it.

< Transaction Share by the trading platform in the USA >

		Transaction Share(%)
Exchanges	NYSE, NYSE Area & NYSE Amex	24.1
	NASDAQ & NASDAQ BX	21.3
	BYX & BZX	11.5
	DDGX & EDGA	8.8
	other	2.2
ECN	LavaFlow	1.8
Darkpool	Knight	2.0
	CrossFinder	1.9
	SIGMA X	1.4
	LX	1.2
	GETMatched	1.0
	SuperX	0.8
	MSpool	0.8
	UBS ATS	0.7
	Liquidnet	0.7
	other	2.7
other(including internalization)		17.1
Total		100

If we check transaction market share by type of trading platform in the US stock market as of April 2012, 67.9% of regular exchanges, 1.8% of ECN, 13.2% of Darkpools, and others (including internalization) account for 17.1%. Even if we sum up of market share of NYSE and NASDAQ, the traditional regular exchanges, it

does not reach 50%. Direct Edge and BATS, which started as ECN and switched to regular exchanges account for 20.3% and Darkpool, internalization, other over-the-counter transactions account for 30.3%. Regular regional exchanges such as CSX (Chicago Stock Exchange), NSX, CBSX (CBOE Stock Exchange), etc. account for only 2.2%. Such a result demonstrates the intense competition between trading platforms.

B) ATS in the Europe

An alternative trading system in Europe began to emerge with the implementation of MiFID in November 2007 as the monopoly structure of existing exchanges which had been maintained through the transaction concentration obligation broke. The alternative trading system can be established freely if it register as a a Service Provider (Financial Service Provider) by the ISD of the EU.

As of September 2012 ESMA (European Securities and Markets Authority) has 149 registered MTFs.

< ATS's situation in the European market >

Classification		System Name
MTF	Lit	BATS Chi-X Europe, Turquoise, Burgundy, NYSE Arca Europe, TOM ETF, Equiduct, Quote MTF
	Dark	BATS Chi-X Europe, Instinet Blockmatch, ITG Posit, Liquidnet, Nomura NX, Nordic@Mid, SIGMA X MTF, Smartpool, UBS MTF, Turquoise, SLS, BLINK MTF, Xetra Midpoint
SI		Most investment Banks
Crossing networking /Broker dark pools		Citadel, CrossFinder, Deutsche Bank SuperX, GETCO

* Source : BATS, Instinet

BATS Chi-X Europe, the most representative MTF in Europe, BATS Europe took over Chi-X Europe for $ 300 million and launched it. Chi-X Europe was founded at England in 2007 by Instinet, a subsidiary of Japan Nomura Holdings. It was the first MTF in the Europe region, established considering the introduction of MiFID, which had increased its market share thanks to low commission fee and fast deal execution system. In 2009, it accounted for 15% out of the UK's FTSE100 stock trading volume and began to result in net profit from 2010. BATS Europe is the MTF established in the UK by BATS, the American ATS, it started trading since October 2008. At the time of integration, Chi-X Europe ranked first in the European market MTF and BATS Europe occupied the second largest share.

Turquoise is a MTF which 9 big investment banks established together at London in 2008 and it provides trading services in the whole-Europe region. In December 2009, the LSE integrated Baikal MTF which LSE owned after acquiring 60% of Turquoise's shares. Equipped with EuroCCP clearing settlement services and Cinnober's trading system in Sweden, it has a real-time market surveillance system. It is evaluated that it has the highest speed in the Europe and has been expanding its liquidity through the "maker-taker" commission system. Turquoise accounts for 8.1% of the trading volume and 4.4% of the transaction value in a European market.

Burgundy, a MTF which North European financial institutions co-founded in Stockholm, started trading in June 2009. it is providing over 1,000 listed stocks trading of Sweden, Norway, Finland and Denmark. Since Burgundy is both a MTF and has been approved by the Swedish FSA as a regular market, Warrant, ETFs, and other structured commodity can be enlisted in it.

Trading platforms such as Dark MTF or Crossing Network are operating actively in Europe. There are many examples of USA Darkpools' enterance to Europe, which ITG, launched in 1987 and a milestone of Darkpool, entered in earnest in Febuary 2008 and Nyfix entered the Nyfix Euro Millennium in 2008. Meanwhile, there are also cases where the exsiting regular Exchanges opened directly Darkpools. NYSE Euronext established SmartPool with multiple investment banks in 2009 and started trading stocks listed in 15 European countries and acquired Nyfix Euro Millennium. Deutsche Börse opened the Xetra Midpoint in 2008 and NASDAQOMX opened Nordic@Mid in 2010 respectively. BATS Chi-X Europe and

Turquoise have both transparent markets within MTF and Dark pools. UBS MTF, SIGMA X MTF and Nomura NX are investment banks-established Darkpools.

< Transaction volume Share by the trading platform in the Europe >

			Transaction Share(%)
Exchanges		LSE Group	21.36
		Euronext	11.63
		Deutsche Boerse	6.79
		MICEX	5.70
		Spanish Exchanges	3.31
		SIX Swiss Exchange	3.14
		NASDAQ OMX Nordic	2.98
		Johannesburg	1.96
		Istanbul	1.27
		Oslo	0.70
		Stuttgart	0.65
		other	1.04
MTF	Lit	BATS Chi-X Europe	10.07
		Turquoise	2.07
		Equiduct	0.25
		Burgundy	0.13
		QuoteMTF	0.03
		NYSE Arca Europe	0.02
		TOM MTF	0.01
	Dark	UBS MTF	0.38
		SIGMA X MTF	0.23
		POSIT	0.18
		Liquidnet	0.11
		Instinet BlockMatch	0.11
		Nomura NX	0.05
		Smartpool	0.02
		BLINK	0.01
SI, Crossing network, other OTC			25.83
Total			100

If we look at the trading value of listed stocks for each type of

trading platform in September 2012, the regular exchanges account for 60.51%, the MTFs account for 13.66% (out of this dark MTFs account for 1.08%), others (including SI and crossing network) account for 25.83%.

C) ATS in Asia

In recent years, alternative trading systems have emerged in Asian markets. Their market shares are not so much to compare with North America and Europe, but a number of alternative trading systems are operating in Japan, Hong Kong, Singapore, and Australia.

< ATS's situation in Asia market >

Classification		System Name
ECN		Instinet CBX Asia, SBI Japanext, Daiwa PTS, Chi-X Japan, Chi-X Australia, Kabu.com PTS, Monex Nighter, Axe ECN
Dark Pools	Block Cross	BlockSec, Liquidnet, Japan Crossing(Instinet)
	Continuous Cross	Chi-East, BlockSec, BIX(BNP Paribas), SIGMA X(Goldman Sachs), Citi Match, CrossFinder(Credit Suisse), MLXN(Merril Lynch), NSPool(Morgan Stanley), UBS PIN, Nomura NX

In Japan, when the trading obligation to concentrate on exchanges in 1998 was abolished and outside-market trading was allowed Proprietary Trading System (PTS), a type of Darkpool, could be established. In 2000 ATS operation system was included in the

securities industry, and in 2004, the price discovery function is given to ATS, so liquidity competition could take place between the regular exchange and the PTS. In 2010, the JSCC provided PTS with clearing and settlement and the clearing and settlement risk of the PTS transaction decreased enormously.

In Australia, at the '10-second rule' was abolished in 2009, Darkpool operation could be possible. The '10-second rule' is that a purchase order and selling order which is matched in an alternative trading system should be placed for 10 seconds on the Australian Stock Exchange (ASX), if the price changes within 10 seconds of being posted, matching can not be maintained. Therefore, in Dark pools like Liquidnet or ITG's POSIT it was impossible for the transaction to occur actively and it was impossible to execute a continuous transaction.Sin ce the abolition of the '10-second regulation ', Dark Pool's share has continued to increase, which the proportion of dark pools reached 29% on a monthly basis in 2012.

3 Regulation of ATS (Alternative Trading System)

Recently, concerns have arisen due to the spread of dark pools. As many transactions portion of institutional investor, massiver traders and information traders, takes place in the Dark Pool, market liquidity is divided, transparency is low, and price discovery function is shrinking. Although there is a lack of empirical evidence for the side effects of dark pools, in the United States and Europe, where the proportion of dark pools is high, the movement to strenghten regulations is becoming more detailed.

In October 2009, the US Securities and Exchange Commission passed the regulation to strengthen the obligation of disclosure more than before. Before that time, if it did not exceed 5% of the total trading amount, it was not necessary to disclose it. However, the new regulations required information to be disclosed if it exceeds 0.25%.

In Europe, there was a movement to strengthen regulation of the dark pools. Organized trading system such as a crossing network, classified as OTC transaction and located in the blind spot, should register to regulation authorities. If the OTF exceeds a certain size or if submitted directly by the customer's order, not a broker, it should switch to MTF. When the crossing network is switched to MTF, like MTF, it must meet the pre-transparency and post-transparency levels and there is a limit to the trading method and pricing method.

2. Improvement of Market Accessibility

1 Outline of Market Accessibility

Market accessibility refers to the degree of intervention of the intermediate broker, the simplicity of procedural steps, and the degree of delay in speed at calling order, cancellation to the trading system. The higher the market access, the less intervention of the broker and the delay of the ordering speed disappears.

One of the most important motivations for high market access is order automation through the algorithm. Algorithm oders are necessary for prevention of order mistakes, reduction of market impact, swif capture of investment opportunity and high market accessibility requires to realize algorithm orders efficiently.

The growth of financial information volume and the progress of information processing capacity have led to the US and European trading markets to the DMA (Direct Memory Access) environment. DMA refers to trading method which investors convey orders to the exchages or ATS by directly using order management system. In here, an order management system is a system whereby a customer enters, corrects, cancel, and so on.

2 Classification of DMA types

Order validation should be checked in order to prevent financial risks that may arise when quantity or calling price size over the

execution range for investor orders is submitted. Order validation check is also important In order to prevent the execution of orders for securities that are prohibited to purchase under laws and regulations or short selling prohibited items.

Most securities firms manage risk due to order errors by establishing membership systems to monitor in advance or after the effectiveness of an order and report. Most investors execute orders through the membership system and order line prior to direct submitting orders to the exchanges. This is called "traditional DMA".

In some cases, investors do not use members' order lines and submitt directly orders to the exchanges by using ID. Member companies gurantee responsibility for the sale of investors using their ID and report this fact to the exchanges. Investors can use commercial services for external vendors to manage the validation of investor's orders by borrowing and using the member company's system or useing a third party guarantee connection system vendor. This is called as "the guaranteed DMA (Sponsored DMA).

3 Proliferation Background and Situation of DMA

A) Proliferation Background

The spread of high frequency trading is the most important background in the emergence of DMA. High frequency requires high market accessibility such as DMA since it uses trading

method to make many calling prices and execute within the short period of time in order to capture momentary happened profit opportunities or execute a continuous market making in high-speed.

As the proportion of high frequency trading increases, it enter low-latency competition between trading markets to accommodate large amounts of orders coming from the high frequency trading. As DMA is recognized as an essential service for realizing low latency, providing services to enhance market access is became a strategic goal for exchanges and alternative trading systems as well as the traditional brokers. As commissions go down with competiton among trading markets and among brokers, there is a growing need to positively accept high-frequency trading.

The proliferation of DMA became the momentum of center axis movement for the execution and management of order enforcement to move from brokers, the sell-side, to the buy-side, the institutional investor. As the customers have the ability to handle the execution of orders directly, brokers and the trading maket concentrate on market access services that allows them to access the market more smoothly. At last, the DMA is the product of the evolution of the trading market infrastructure to satisfy the diverse investment needs in the capital market.

B) Situation

Major exchanges around the world try to increase their liquidity and to strengthen trading convenience through DMA services provision. More than 60 exchanges around the world allow DMAs

and provide short-distance access services to attract orders using algorithms. According to the degree of access to the market, the services that are provided are classified as proximity service and co-location service. The co-location service is the service to maxmize market accessibility by installing the investors' order server in the data center where the trading system of the exchange is located. On the other hand, Proximity services refer to services installing order servers in the data center of third parties (telecom companies, etc.) close to the exchange.

< Proximity Services and Co-location Services Introduction Situation of the foreign main exchanges >

exchanges	year	Contents
NYSE	2010	Co-location through the New jersey and London center
LSE	2008	Exchange Hosting service
	2010	Hosting third parties and non-members
DB	2006	Proximity Service through the IT subsidiary
ASX	2008	Co-location Services
	2011	Australian Liquidity Center and Co-loation service
TSE	2009	Co-location Service
SGX	2008	Proximity service through connecting SingTel
	2011	Co-location establishment
HKEX	2012	Co-location Service

In the US, Various DMA access methods are provided for the exchanges and brokers to select and use according to the customer's communications environment and cost burden capabilities. In case of CME, it provides a system to access major markets in the US and overseas markets through DMA.

4 Effect of market accessibility improvement

Improvement of market accessibility has brought about a variety of profound effect to capital market trading process and infrastructure. From the perspective of the buying sector, the order can now be processed flexibly and quickly according to the market price and liquidity fluctuations. With this, cost can be reduced by minimizing manual intervention and as the order is automated, the operational risk like manipulation errors is reduced. Since the order is made by the computer system rather than delivering orders through a broker, there is also the effect of maintaining the confidentiality of customer orders.

A positive effect of reducing transaction costs can occur as market access increases, while liquidity increases. This is because spread among calling prices can be shrinked and transaction indirect cost can be reduced as the market-making transaction is activated by using the algorithm.

3. High Frequency Trading

① Outline of high frequency trading

High frequency trading has the following characteristics: ① For order delivery and deal execution, using the fasten speed and sophisticated automation programs, ② to lessen the network delay, using co-location services and individual data feeds, ③ it use a very short period of time to build and organize positions. ④ Also, many order cancellations are made within a short time after order submission, and ⑤ have a characteristic to set the position to zero before the market ends.

High frequency trading was first applied in the US stock option market. In 2003, United States Citadel Investment Group, a hedge fund, played a role as a market maker of stock options listed on ISE. High frequency trading was possible as ISE implemented the electronic limit order book system in the stock options market. The reason that options are the proper products for high frequency trading was that it was necessary to have a high computing or calculation ability becasuse the price calculation of the option depends on several variables (price, volatility, maturity, interest rate, etc. of the underlying assets).

There is a balance relationship based on financial transactions between put options and between call options and options and underlying assets. The ability to instantaneously find options outside of the balance relationship depends on the computer. As option

contracts also include maturities and exercise price for the same underlying assets, the direction of conditional payment at maturity, it is necessary to monitor prices and find out the adequacy of prices.

High frequency trading can include both passive and active transactions. The passive transactions refer to transactions at least passively accepting the current quotation or improving the quotation and providing liquidity. The high frequency trading's main income source is commission received from the exchanges according to quotation spread and liquidity supply.

On the other hand, active transactions refer to transactions to obtain liquidity at the current price. As active traders take the quotes provided by passive traders, they pay commission to the exchanges. These are high-frequency trading types to realize profit opportunity according to price change. The same subject sometimes implements strategy by mixing passive and active transactions.

2 Emergence Background of high frequency trading

As ATS or MTF which is spread according to Reg NMS implementation in the US and MiFID implementation in Europe is equipped with low transaction cost and fast deal execution speed, it is used as main transaction markets of high frequency trading. To attract high-frequency market makers who provide massive transaction volume and liquidity, low-delay systems, sponsored

access, co-loaction services are being popularized. Through the maker-taker commission system, eco-systems began to form between the liquidity provider and the liquidity demander.

The introduction of decimal quotation also accelerated the electronicization. As US Stock Exchange in 2001 reduced the tick size from $ 1/8 to $ 1/100 the quotation spread and quotation remaining quantity decreased drasmaticly. As a result, the profitability of the broker-dealers mainly coming from the quotation spread has deteriorated, and they propelled the introduction of high frequency trading and algorithm trading to secure new revenue base. Also, as the correlation between trading size and price shock increases, the need for a trading strategy to mimimize the market impact shock costs increased.

The main characteristics of the changes in the market environment are diversification of markets and products, diversification of trading channels, and trading speed. It became to be possible to select the market and the trading route based on the level of price, transaction cost, and anonymity. As the high frequency trading is possible, the importance and necessity of algorithm trading to realize optimal trading strategies stands out. In addition, as the amount of financial data that needs to be analyzed increases dramatically, the need for linkage of analysis and transactions and automation has increased.

3 Situation of high frequency trading

A) USA and Europe

Different data exsits according to the definition, measurement method, and time of high frequency trading, but it is roughly estimated that high frequency trading accounts for 50-60% of the trading volume in the US stock market.

According to the TABB Group data, out of trading volume by US stock market traders the high-frequency traders' trading ratio accounts for 61% of the transactions.

Independent high-frequency traders and high-frequency trading brokers & market makers account for 57% and hedge funds account for 4% of high frequency traders.

In the European market, about 120 trading institutions, 1.8% of which are traders, are paticipatng n high frequency trading, roughly accounting for 50% of total daily stock trading volume. It is estimatied that in the Germany market, 43% of the volume of transactions through the Xetra system in 2008 happened by the high frequency trading and high frequency trading accounts for 68% of small orders, less than 500 stocks.

With the increase of high frequency trading, trading volume has increased significantly compared to the past and the size of the transaction per trading was smaller. The daily average trading volume of NYSE listed stocks has increased nearly three times

from 2.1 billion stocks in 2005 to 5.9 billion stocks in 2009. The average number of transactions per day in NYSE increased 7.6 times from 2.9 million in 2005 to 22 million in 2009. The number of transaction stock per order of listed stocks decreased one of third from 724 stocks in 2005 to 268 stocks in 2009. Order closing time reduced drastically, NYSE Euronext US recorded 5 milliseconds and NYSE Euronext Europe recorded between 0.15 and 0.40 millisecond.

B) Asia

Algorithmic trading of Asian markets (including high frequency trading) is still at the beginning stage, but it shows that some countries such as Japan, Singapore and Hong Kong record dramatic growth rate. Based on 2008 trading volume, it is estimated that algorithm trading for the Japanese market is 8%, that of Singapore market is 14%, and that of Hong Kong market is at 21%. The estimate of Australian market is not known, but as it thas been working on improving the trading system, reorganizing the commission system, and providing co-location services it is evaluated that it occupies a certain amount of propotion of it.

According to a survey of the Japanese market in 2009 by the Nomura Research Institute, 71% of Japanese asset management companies were using algorithmic trading and about 31% were executing algorithmic trading daily. In Japan, DMA and algorithm trading were widely recognized as trading methods with the lowest transaction cost. The order management system (OMS) of Japanese market is basically equipped with algorithm and he algorithm can be applied directly by securities firms.

Other Asian markets, excluding those markets, have difficult environment for algorithm trading & high frequency trading to spread due to ① regulatory barriers, ② quotation spread's size · variation, ③ low FIX protocol adoption rate, ④ the low perception of the algorithm · high frequency trading. For example, in Thailand the proportion of algorithm trading out of all stocks transaction accounts for only 0.7% in 2008. The utilization rate of FIX effective in high frequency trading in Asian market is very low, 35% and wide quotation spread and the high volatility of quotation spread are not proper environment for algorithm trading. Also, the number of big financial institutions which are accustomed to algorithm · high frequency trading are few and the spot finacial institutions do not know well about algorithm · high frequency trading, so it is hard for algorithm · high frequency trading to be spread.

4 Major issues related to high frequency trading

A) Market price adjustment

In that that a investor with goodwill who is willing to consume liquidity like an institutional investor suffers damage, it was suggested that mass trading attractiveness strategy, liquidity capture through predatory search and attractiveness should be regarded as de facto pre-trading. In the US SEC, it consider benefit from a strategy to attract and anticipate an order unfair.

On the other hand, someone insists that high frequency trading is

not an unfair market price adjustment. In the market there are already various ordering algorithm to mitigate the market impact cost and as pattern recognition through random ordering is not possible in most cases, attraction strategies, predatory searches are possible in theory, but it is very difficult to realize profit in fact. It it is impossible to distinguish between which order is the attraction order and the exploratory search. In addition, if all investors can access to open market information, exploring the market price is the same principle with predicting market direction. Therefore, it is natural to predict the buying strength or the buying direction in advance and the price offered by high frequency market makers is empirically fair.

B) Increase of volatility

Someones raised a claim that frequent transactions due to high frequency trading increase unnecessary information and grow volatility. However, However, cause and effect is not formally confirmed that whether high frequency trading increase volatility or whether the bigger volatility the greater high frequency trading. But, factors exist enough that the bigger volatility the greater high frequency trading. When volatility is expanded, the spread of the market price will increase, creating favorable situation to market makers that take the market spread.

In addition, in the time of volatility expansion, the more frequent opportunities for financial transactions, high frequency trading is able to increase. However, on May 6, 2010, in Flash Crash Incident

at the USA the liquidity of high frequency trading sharply decreased at the time of the crisis, which volatility expansion over the limit can be a factor for reducing high frequency trading.

When discussing the impact of high frequency trading on volatility, it is necessary to distinguish between shot-term volatility and long-term volatility. Because short-term volatility is closely related to the quality of market, while long-term volatility is more influenced by economic basic conditionsis independent of the market structure. In the case of Flash Crash, in which the volatility of short-term volatility has increased, which weaken stability of the stock market trading system and weaken the confidence in deal execution.

C) System stability due to order massiveness

The claim was raised that Flash Crash on May 6, 2010 in the US exchange market was triggered due to high frequency trading. This is based on the scenario that if not controlled the order error of the specific high frequency trading system, the order can be executed at the abnormal price, which effects consecutively the other high frequency trading systems and can spread throughout the market.

The committee's final report the US CFTC and the SEC have established to identify the cause of the Flash Crash pointed out that as the cause of Flash Crash it did not indicate high frequency trading, but when market liquidity evaporates, automated trading algorithm sends a market price order, it can cause a plunge in price

and at the time of such market price plunge the supply of liquidity through high-frequency trading was retrieved and the extent of the market price downturn has widened.

Selling 75,000 futures contracts for the purpose of hedging, certain mutual funds on the day of Flash Crash provide the beginning of a market downtun. At the early execution stage, most of the sales volume is absorbed by high-frequency traders, net buying position accumulated until 3,300 contracts. However, in order to manage the position as a part of risk management, switched to selling and on May 6, 2010 at 2:41 pm to 2:54, the leading index plunged by 5~6%. Pretty soon, most of the indexes returned to their original state, but several individual items and ETF contract prices experienced extreme fluctuations.

Such abnormal prices execution happened while price movement of derivatives product market transferred rapidly to the spot market in the state of high linkage between the derivative market and the spot market due to the index product's(Index futures, ETFs, etc.) broad listing.

In order to hedge the buying position the arbitrage traders sold SPY, the same index ETF, so the price of SPY dropped by 3%, and the price decline in the futures market reached the excess level, which Market makers who have supplied liquidity the spot stocks in the index stopped the liquidity supply by the internal risk management provision.

Under the preposition that ordering mistakes or errors through

high frequency algorithms can cause market instability, market access will continue to be discussed in depth. All. The opinion that the regulation is needed for high frequency trading institutions is suddested, that is, to keep the obligation to submit quotation prices and to prohibit the behavior to take liquidity.

D) Fairness of co-location services

In relation to the fairness of co-location services, it is argued that the institutions using the co-location services outpassed the other institutions in terms of funding and know-how and they are playing the unfair game with ordinary investors. On the other hand, as there is a fundamental difference in investment objectives between investors who use co-location services and those who do not direct comparison is hard. It is based on the position that there is no room for unfairness because investment time of investors such as value investors and pension funds is a mid-to-long term and basically its investment objectives are different from those of high frequency traders.

In the United States, as co-location services are already gerneralized co-location services are not accessible services to only small number of investors and it is possible to monitor effectively the user's situation and the level of risk management. Rather, transparency lowerness and unfairness can be possible in the case of proximity services that increase market access individually. If prohibitting co-location service, competition for proximity service will become more intense, it is hard to exclude the possibility that the difficulty will be further increased.

5 The impact of high frequency trading on the market

The focus of the research on high frequency trading has been conducted on what effect the increase of high frequency trading to quotation price spread, price discovery function, and volatility. In the early papers, they claimed that high frequency trading caused a decrease in the quotation spread and liquidity increase and idiosyncratic volatility of stocks decrease. And it suggested that high frequency trading has positive correlation with permanent price changes and has negative correlation with temporary price changes, which is improving the price discovery function.

However, the other papers have identified the negative aspects of high frequency trading. While studying the market phenomena after the Flash Crash, they are re-examining the roles of the high frequency trading. They warn that if liquidity is retrieved by high frequency trading market makers, market downfall like Flash Crash will reappear. Market makers provide liquidity when markets are normal, but if the market changes abnormally they could not help retrieving liquidity and it can make the situation worse.

Also due to the quote stuffing, the liquidity of the specific stock shrinks and short-term volatility increases, it is reported that transaction costs increase. In addition, the existing market microstructure study measures the quality of the market with shrinking quotation spread, but this underestimates the real transaction cost. In the case of the United States, as trading volume per quotation unit fall down from average 2,700 between 1997 and

2006 to average 400 between 2007 and 2009 the real transaction costs will be the same or can be increased because investors should split the quantitiy and process it in order to trade stocks in large quantities.

The impact of high frequency trading on the market has not yet been fully studied. However, there is a new light on the role of high frequency trading after the Flash Crash. In a situation where there is no obligation to create a market, the fact that it is possible to bring about a sharp fall in the market could be evaluated as a newly prominent issue. In the United States and Europe, the introduction of the regulatory framework has been disscussed.

⑥ Regulations Discussion of high frequency trading_

A) SEC Rule 15c3-5

In the absence of appropriate prior risk management or internal order validation checks, concerned that system risk could be caused by order errors, the SEC published a series of regulations, Rule 15c3-5, on November 15, 2010.

This regulatory measure are requlation who has policy targets, brokers or dealers can directly trade in the regular exchanges or ATS, brokers or dealers who provide sponsored market access to customers, and brokers or dealers operating ATS. Limiting systematically the financial risks of brokers and dealers that may arise from market accessibility and ensuring the implementation of the relevant provisions of the market access process and

establishing risk management procedure and monitoring are main contents.

The risk management system and oversight procedures the SEC requires not to exceed the capital limit or quota credit and not enter errored order. That is, it meets all regulatory requirements on the basis before ordering and allows brokers or dealers to block prohibited orders, and to allow only authorized personnel use technology and system for market access. Therefore, dealers and brokers with market access directly and exclusively control the risk management system and supervisory system.

In addition, after reviewing broker or dealer activity related to the effectiveness of the system and supervisory system, it is provisonalized to be documented in accordance with procedures established at annual least unit. Representative director of a broker or dealer company or equivalent manager must demonstrate compliance with Rule 15c3-5 with a signitured document.

B) CFTC-SEC Joint Advisory Committee Recommendation

To prevent recurrence US stock market Flash Crash happened on May 6, 2010, the CFTC-SEC Joint Advisory Committee (hereinafter referred to as the Committee) announced regulaton recommendation s.[5] The main contents are classified as largely volatility, market accessibility, and liquidity.

5) It is the Commission's recommendation, not the official regulations of the CFTC or the SEC

a) Volatility Recommendations

The Committee agreed that the SEC, in consultation with the Exchange and FINRA, takes volatility related actions. The main points are the introduction of individual securities 'Pause Rule' for actively traded ETFs with the Russell 1000 stocks and the introduction a limit up-limit down regulation of individual stock prices. Pause Rule is a way to stop trading for 5 minutesthe when price of individual stocks changes by more than 10% within five minutes during the market open time. After 5 minutes, the starting price shall be decided by standard opening price calculation method of an exchange listed on the stock.

In addition, the obligatory provision is included to prohibit price quotes, stub quotes, the market makers suggest at extream price to execute formaly the obligation. Besides, the committee recommended to expand the range of shares at most, which includes stocks and ETFs excluding liquidity shortage stocks, individual shares option.

Because the upper and lower bounds of the individual stock prices are possible to trade within the in advance provisionalized price, it is a regulation that can compensate the disadvantage of the Pause Rule, even if the reverse liquidity is restored the trading does not happen.

The committee reviewed market-wide circuit breaker regulations according to the index felldown and recommendend that reduction of the time that circuit breakers are applied, extension of applicaton time line and change of standard index to S&P500. As the current

reference index, The Dow Jones Index is being used and the circuit breaker can last up to 2 hours, which is a regulation established in 1987, it is because it is an excessively long time in high frequency trading environment.

b) Recommendations on market accessibility

The Committee recommended the CFTC to use algorithm order strategy or the FCM (Futures Commission Merchant) to give a strict supervisory obligation and to review the benefit and cost in detail of strategy that triggers many orders and trading behavior caused market disruption.

Dodd-Frank Act Section 747, fair and equitable, noted that certain marketing and quoting practices that disturb marketing are prohibited, and amended Section 4c (a) of the Commodity Exchange Act and provided the CFTC authorities to prohibit all of the trading practices that caused market disturbance.

c) Recommendations on liquidity

Under the market structure, the Committee suggested four considerations for the supply of liquidity under the recognition that incentive for liquidity supply are weak.

The first is related to commission fees. The Committee recommended that the SEC should review the potential benefits

according to maker-taker's pricing changing practices. The exchanges compete based on maker-taker pricing policy and the SEC's Regulation NMS has the limit on the taker commission fee, but there are no restrictions on rebates. Considering this point, the exchanges internalize incentives by introducing a "peak load" pricing model. "Peak load" pricing plays supplimentary roles when market volatility increases as the maker rebate and taker fee can be raised at the same time, in terms of being able to provide incentives to maintain liquidity supply.

The second is related to the obligations of the market maker. The Committee recommended that the SEC should review to find out the incentives or the regulations to encourage investors who suggenst trading quotates reasonably related to the market.

It is recommended to review whether it is possible to f Regulation

Prior to the regulation NMS, the regular exchanges provionalized market makers' right and obligation through the specialist system, but after the Regulation NMS, due to the emergence of market division and high frequency traders, as official market makers' such as market specialists profit decreased, they played little roles.

The profit margins have decreased and their role has been remarkably reduced. Also, the strategy that high frequency wholesalers take is essentially substituting for the role of market maker, but not a registered broker-dealer, and at the time of Flash Crash, the liquidity associated with high frequency trading is rapidly retrieved and the market downfall was expanded. As a result, solution recommendation that offer quotations even when market

volatility increases should be suggested. In addition, the commisttee recommended the SEC and CFTC to make policy to distribute fairly costs caused by cancellation of high frequency orders.

Third are the contents related to order transfer preference, internalization and transmission protocol. The Committee recommendend that the SEC should analyze the effect coming from the internalization of customer orders by broker-dealer and privileged execution access. In past the SEC said the transmission of orders to and from certain broker-dealers could potentially increase competition and decrease transaction costs. However, in fact, these internal orders flow was not internally digested at the time of the Flash Crash, it was trasmitted and applied as the burden of the volume, careful review is necessary how the order flow containing the market information at the designated order book of the regular exchange market affect the incentives.

Finally, it is the recommendation related to information accessibility. Disclosure of measurement units for the liquidity of large trading market and market imbalance should be mandatory, which is because under the high-frequency trading environment, due to the rapid rate of order transmission and execution, order book's imbalance can progress rapidly it became important to provide imbalance information on book liquidity.

The Committee recommended the SEC to analyze Benefit/Cost according to establishing consolidated audit trail of US stock market and the CFTC to enhance the data collection.

d) SEC approval regulations

On June 14, 2010, under the FINRA's proposal and the SEC's approval, "Single Stock Circuit Breaker Rule" was introduced. If there is a sudden change of 10% or more of the base price within 5 minutes about USA NMS all stocks, the right stock is prohibited in the market. In addition, the SEC approved a separate Limit Up-Limit Down Rule. These regulations replace individual stock circuit breakers. Upper limit - Lower limit regulation set a band of 5% and 10% depending on the liquidity level of each stock, after reaching the upper limit or the lower limit, the specific stock's trading is prohibited.

The SEC will also introduce a revised market circuit breaker regulation and approved on May 31. This is due to the fact that in 2010 Flash Crash, the existing circuit breaker was not operated well. It replaced Standard Index from DJIA to S &P500, circuit breaker operating criteria from 10%, 20%, 30% to 7%, 13%, 20%, while the 30-minute stop was changed to the 15-minute stop. Narrowing the changing width to ignite the circuit can make it work more sensitive and can recognize the market liquidity flow by the use of algorithms.

e) MiFID II

The first amendment to MiFID was announced in December 2010, the following are the contents related to market access and high frequency trading: ① As interpreting automated trading broadly, it is defined as computer related trading in determining all matters

related to the sale, trading time, quantity and price. High frequency trading is classfied a subcategory of automatic trading.

② It proposed that a high-frequency trader who trades in excess of a certain quantity limit should obtain authorization as an investment firm. This can be considered to accept high frequency traders as institutional requirements and regulatory oversight objects.

③ Investors who are authorized to auto-trading might organize risk management to minimize potential trading system errors and should report the design, purpose, and function of the algorithm which they use to the regulatory organization. In addition, the company provides automatic dealers with services such as sponsored access services should establish filtering facility for risk management and ordering errors. Trading operators should prepare the proper risk management such as the sale disturbance or the sale system suspension. In addition, trading operators should provide equal and fair access to co-location services for participants

④ The minimum quotation unit can be discussed further in the future.

⑤ Trading market operators should be aware that when high frequency traders trade the specific financial products a lot, they should provide liquidity continuously to high frequency traders.

⑥ Trading market operators must place orders to remain on the

order books for a minimum period of time before canceling them and should place order numbers of execution numbers ratio not to exceed the specific level.

The MiFID revision process has continued since then, and in October 2011 high frequency trading regulations have been strengthened and the contents are as follows:

① An investment company involved in the sale of an algorithm should have sufficient risk management ability and it must be equipped with an efficient system and it should set an appropriate trading limit to prevent order errors. The investment company's risk management system cannot be used for any purpose against the regulation, including the principle of the market and adequate system testing and monitoring should be performed.

② Investment companies involved in the trading of algorithms should submit a report pertaining to algorithmic trading strategies to the relevant authorities in the country concerned more than once a year. In addition to the actual risk management, this report includes trading parameters, limitations on trading, compliance, etc. The relevant agency may have the authority to ask additional information at any time.

③ Trading parameters and trading limit of algorithm trading strategy shoul be set up to provide liquidity continuously to trading market so that quotations should be suggested at competition price under the any market situations.

④ Investment companies that provide DMA to the trading market should review and check whether the service user is using it appropriately through the effective system. Through this, they monitor the sale through DMA and manage the risk by limiting the excess of the established trading volume and credit limit

⑤ As a settlement member, the investment company shouldl equip the proper system and carry out inspections. The settlement service is only available to those who meet all the criteria and requirements. This is for reducing the risks facing both the market and the company and it should be proved in paper contracts

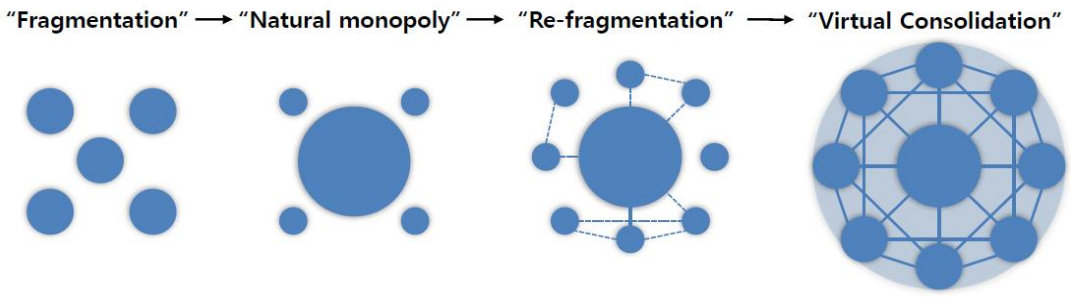
⑥ It is suggested that the minimum call remaining time should be in order to prevent for high-frequency traders and algorithmic traders to repeat the order entry and cancellation. This not only reduces errors in IT systems and market operations, but also prevent market abuse through the price manipulation, which MiFID suggested no-modification and no-cancellation for the 0.5 second.

Changing aspect of Global Exchanges

1 Redifferentiation trend after integration

New types of transaction flatforms such as ATS, inner order execution, etc. emerged thanks to IT development and variety of transaction demand. Thereafter, trading execution function which was concentrated on the monopoly exchanges is refifferentiated to various organizations.

【 The exchange competition structure and regulatory environment's change aspect 】



2 Borderess strenghtening Competition

Due to liberalization of capital market and IT technology development, global competition is in full swing to attract transaction order and companies listing. There are viable many efforts to overcome business area's local limit through M&A, the linkage among markets and to strenghten product competition.

【 Global exchanges' major M&A cases 】

- ICE : To be the largest exchange through aquistion of NYSE, and business area diversification to stock.derivatives(2013.11)
- HKEx : Business area expansion to general products and acquisition(2012.12) of LME to be one of the global exchange
- LSE : Acquisition of Turquoise, the second largest MTF in Europe (2010.2) to respond the competition with MTF, an ATS
- NYSE.Euronext M&A(2007)*, Nasdaq.OMX M&A(2008) : M&A Between the USA and EU to overcome local limit of business area

In asia, Singapore SGX linked to asian, Thiwan, Japan's exchanges and Hong Kong HKEx is expanding integration with chinese market. Japan JPX also propelled changes such as switch to holding company and listing in 2013.

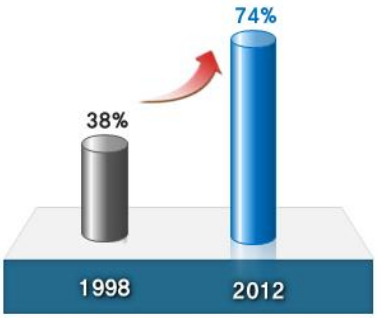
3 Exchanges' identity change

There are definite aspects that the exchages change from membership public infrastructure to market service institution of private-centered. There increased many cases to try flexibility of exchange structure · governance structure and the listing of the exchanges was generalized. LSE(England), DB(Germany), NYSE(USA), Nasdaq(USA), SGX(Singapore), HKEx(Hong Kong), ASZ(Australia), JPX(Japan) are all holding companies and already were listed.

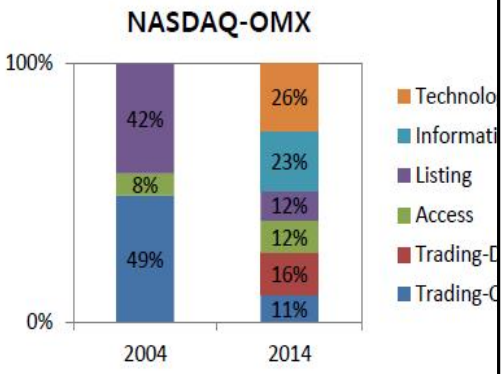
They expand business areas such as Index development, information business, clearing business, not the trading commission centered

business area. That is, they become total IT service companies.

【 profit exchange portion 】



【 profit diversification case 】



4 Change of regulation function

With commecialization · listing of the exchanges, as the possibility of interest confict about public functions(market surveilance, disclosure, listing examination about the exchang itself, etc.) which the exchanges implemented is pointed out, adjustment for this is on the full swing. They are shinking the possibility of interest conflict in various types such as division of regulation function from profit corporation or tranfer to regulatory authorities.

⇨ The foreign exchanges expand business areas through switch to holding company, linkage with domestic · foreign competition and strengthen product competiton. This competiton improved the profitability of the exchanges and services to companies · investors.

< Capital provision need for growing mid-size companies >

Recently, there is a consensus on the necessity to support growing SMEs. As the longer the economic crisis, the more the need to prepare fundamental solutions for the future growth, interest in small venture companies has increased. It is the reason that technology development through small and medium venture companies and job creation would be a key factor in achieving mid-term and long-term growth and development of the economy. As a result, each country is dedicated to the development of SMEs.

The exchanges are making efforts to provide supportive measures fot the SMEs by providing of opportunities for direct financing through the market for financing of difficult SMEs. The governments also made efforts to help facilitate the financing of SMEs businesses. Since it is difficult for SMEs companies to approach the existing stock market which is characterized by high entry barriers, most SMEs have to make initial capital procurement from Bank loans. Due to the collateral-based lending practices of indirect financial institutions such as banks, not only is it difficult to finance from the banks, but even it is possible, the burden of high interest should be paid. Therefore, in order to help early growth stage SMEs, it is necessary various measures to revitalize direct financing through capital markets.

VI. Situation of Korea exchange industry

Korea's exchange industry is back behind the international change trend of exchange industry due to monopoly position, non-profit public organizational characteristic and etc

1 Limit due to competition deficiency among the exchages

Korea exchange industry's enlisting services are very low. If we looked at the listing companies between 2012 and 2014, korea's enlisting performance is very low comparing to those of main foreign countries. NYSE, NASDAQ and LSE's enlisting companies two years' performance respectively were over 300. However, Korea only recorded just over 100.

< enlisting performance of main foreign exchanges (2012-14)>

NYSE(USA)	NASDAQ (USA)	LSE (England)	HKEx (Hong kong)	JPX (Japan)	KRX (Korea)
349	411	333	272	137	114

It is estimated that many companies are qualified for stock market enlisting conditions but the number of new listing companies are small due to shortage of assertive listing efforts and incentives. In the market, it is estimated that about 600 companies are qualified for KOSPI enlisting conditions out of external audit companies and about 9,000 companies are qualified for KOSDAQ enlisting conditions. However, new listed companies are about 40 per year.

Enlisting vitality lowness mainly comes from supply monopoly of

listing services. For now, listing system does not adopt the environment change(ex. market environment, company growth pattern's change from manufacture to innovative system of ICT) and listing threshold is getting higher due to strict operation of listing system and conservatization of listing examination(ex. listing examination focusing on profit prodution at the listing time rather than future growth potential of companies). That is, incentive to adopt growth potential companies is weak and listing examination put a priority on the problem prevention. Therefore, innovative companies which have high growth potential cannot access to stock exchange industry and result in opportunity shinking of business expansion and funding. If we comparing to NASDAQ with KOSDAQ, NASDAQ fostered favorable environment to high growth companies by accepting various listing standard and applying for flexible quality examination. However, KOSDAQ maintains listing standard of profit-focus condition.

Funtion of KOSDAQ market is getting weaker. While KOSPI market and KOSDAQ market are operated as the same way without competition, KOSDAQ market as an innovative and adventurours market doest not play a role for it and there is a limit of development. Since two markets share operational performance and personnel appointment system is cycling rotation, KOSDAQ market does not have an incentive to survive itself. Therfore, development efforts such as creation of representive index, commodities related to stocks are short. To be more specific: ① alternative index development does not happen even if KOSDAQ premier, Star index lose their competition ability, ② There is no inner-maket derivative commodity that have base asset on KOSDAQ. There also is effort shortage to adopt the representive

good companies. Nexon, a representive game company in Korea, listed Japan JPX in 2011, not listed on the Korea exchange.

2 Limit due to non-profit public organization character

As KRX (The Korea Exchange) had been appointed as a public organization between 2009 and 2014, character of KRX's public infra structure had been emphasized. Therfore, problems happened in the perspective of efficience of administration management and internationalization.

First, there happened in-efficiency of administraion management. Since it did not classify the profitability of each segments, compensation followed by operation performace was not properly given and the incentive structure has been weaker. Due to non-profit governace which KRX upper management did not have accountablity to operation performance, efforts to enhance profitability has been weaker. Therfore, dynamics of structure operation has been lower while market principle and competition logic did not play a role.

Secondly, internationalization's performace was very unsuccessful. Business activities of corporate viewpoint such as business area expansion through the relation to foreign exchanges, business diversification through the M&A was very rare. In a situation which barriers among countries disappear as shown an increase of foreign direct investment, there are worries that Korea exchange industry can fall down to be an isolated regional market. Business areas are confined to domestic and profit base are very simple like sales commission-centered and there are not enough efforts to

overcome these limits. Therefore, profitability of KRX is prominantly low comparing to foreign main exchanges.(ex. Net profit ratio of 2014 : SingaporeSGX 46%, Hong Kong HKEx 52%, KRX 18% / ROE of 2014 : SingaporeSGX 35%, Hong Kong HKEx 24%, KRX 14%)

3 Limit due to competition shortage with outside infrastructures

There formed an uni-market structure which there is no competition between the exchanges and outside infrastructures since ATS (Alternative Trading System) and off-board market did not developt enough.

First, there is no trading execution service competition system in the Korea exchange industry. In the trading execution part, the Korea exchange maintain its monopoly position because trading infrastructure such as ATS, inner order execution did not develop enough to compete with the regular exchange. In Korea, ATS's introduction basis is made from amendment of Capital Market Act in 2013, but ATS is still not established in the reason of business prospect's uncertainty. Comparing to foreign main countries, trading execution services' variety and efficiency of price setting are very low in Korea and investors' choice right is restricted. The number of ATS is 85 for the USA, 153 for the Europe, 9 for Canada, 2 for Japan and zero for Korea respectively. Trading market share in the USA, the EU almost reached about 30% and big ATSs' transition to the regular exchanges happened. Even in Japan, Trading market share reached 7.5% in 2014.

There is a limited opportunity to get back due to the skewedness of the portion of inner-market. Without the developmental competition between inner-outside market, venture capital provision to the market is limited and listed companies's financing is restricted.

VII. Implications and Policy Consideration factors for Korea exchange industry

1. Conclusion ad Implications

The reason of the physical concept of the exchanges has gradually begun is due to liberalization of capital movement and the development of electronic trading system. As the scope of activities of corporations and investors is globalized, companies began to list them on foreign markets and investors begun to invest on foreign markets. As the more stocks and investors are gathering on the markets fierce competition began to attract customers to their markets among the exchanges. This movement was fastened by the development of electronic trading systems.

The need to trade in face-to-face meetings has disappeared. As the market became increasingly automated, the choice of exchanges became easier and transaction costs lowered. The exchange of physical concepts that had the monopoly power began to be exposed to competition.

The exchanges exposed to competition faced the need for organizational efficiency and service improvements and in order to do this, they began to transit stock companies away from the traditional nonprofit membership structure. By switching into stock companies capital finacing from the markets could be possible and management efficiency could be accomplished by the capital market evaluation and discipline and the creation of synergies through

mergers and acquisitions could be possible.

Out of the world's major exchanges, the weight of the exchanges operated for commercial purposes was only 38% in 1998, but it reached 83% in 2011. Through demutualizaton commercialized exchanges began to agressively merger and acquisition. To realize economies of scale and economies of range and to enjoy liquidity externality, the exchanges has pursued vertical and horizontal mergers and acquisitions with other exchanges, clearing · settlement organizations, and financial IT institutions.

After 2000s, the number of acquisitions and mergers in exchanges has reached over 200, half of these are international acquisitions and mergers, most of which have occurred since the mid-2000s. There emerged also the extravagant exchanges such as the NYSE Euronext and the NASDAQ OMX covering the US and Europe.

There still are the flow of integration between the exchanges because changes in the regulatory and technological environment surrounding the capital markets are progressinge. Especially it seems that emerging markets such as asia will be at the center of this trend(demutualization, listing, local blockedlization) in the future. As, however, economic, social, cultural and geographical gap in asian countries is large, a little slower change is expected than in North America and Europe.

When it comes to dramatical change at the topography of exchanges in North America and Europe, the impact of environmental change was great. Since Reg NMS in the US and

MiFIDs in Europe recognize the different types of trading platforms as markets by promoting competition among markets, they target to enchance market liquidity and efficiency.

While they set securing the best execution and enhancing market transparency as basic principles they abolished the exsiting regulation factors which had blocked competition between exchanges. The United States consiting of a single market and Europe consisting of many countries are different due to the given conditions. Therefore, the detailed provisions are different and the United States lead changes, but the impact on the stock market of Reg NMS and MiFID is similar. Various transaction platforms other than regular exchanges are formed and competing, which diversify services related to trading and reduce transaction costs. And the advanced IT technology has been rapidly penetrating the financial industry.

In the US market, the traditional exchangs such as NYSE and NASDAQ account for only about 40% of the stock trading, and the ratio of traditional exchanges such as LSE and Deutsche Borse accounts for about 60%. Most of the rest are new emerged trading platforms, that is, Alternative Trading Systems. The target of competition among markets is liquidity, the power to move liquidity is the principle of the best execution and to make the best execution possible is transparent market information and the advance IT. This is a key principle that virtually divided markets are virtually integrated and that is the vision of stock market regulation change the USA and European pursue.

An alternative trading system is a trading platform with only the trading function of stocks, which is rapidly spreading while Reg NMS and MiFID officially included it in the framework of competition between markets. These are encroaching fast the market through advanced trading systems, low commission fees, various execution methodes and order forms, and trading services utilizing financial IT technology.

The establishment and operation of alternative trading system is accomplished by the big financial institutions, it is as a part of the profit-making business and it reduces transaction cost and meets demand for transaction services. In addition, in conjunction with the financial company's own global network, they expand their business areas. Traditional regular exchanges are responding through improvement of the trading system, commission fee improvement system, institutional investor incentive provision, verification of trading stocks to compete with alternative trading systems.

In this process, there are many cases of propelling mergers & acquisitions with alternative trading systems or the regular exchanges or establishing alternative trading systems by themselves. Successful alternative trading systems, such as BATS, Direct Edge and Alpha are switching to the regular exchanges for business diversification or by regulations. Some alternative trading systems such as dark pools are evolving to provide discriminatory services that the regular exchanges cannot accept and supply

Along with the diversification of trading platforms and the development of financial IT technology, high frequency trading is

is rapidly increasing. Earning profit through high-frequency automated ordering and execution, it requires high market access and sophisticated algorithms and each platform is actively providing high-tech trading services to attract investors. Statistics show that high frequency trading accounts for many portion of US and Europe stock trading. However, after the Flash Crash incident in the market, while entire market's system risk increase by order errors or intended market distrubance associated with high frequency trading, there are discussions to strengthen regulations about high frequency trading. Instead of significantly restricting market accessibility of high frequency trading, a way to inhance risk management system and to mitigate volatility is being considered. The evaluation of high frequency trading's effect to market are in disagreement. High frequency trading expands liquidity and improves the price discovery function. On the other hand, sometimes it causes to increase transaction costs and to market price plunge due to liquidity retrievement and excessive turnover rate.

At least in North America and Europe, it is evaluated that there has been a great progress in the market efficiency and reduction of transacntion costs through the competition among markets. Investors got benefits of the reduction of transaction costs and the diversification of trading goods and trading services through the trading platform's diversification and competition, and the problem of market segmentation is solved by the reasonable regulation systems such as the best execution principles, market transparency and accessibility. Meanwhile, the boundaries between the regular exchanges and alternative trading system are getting dim and those between open market and non-open market are emerging.

As institutional investors' demand for non-open market is getting higher, concerns about the deterioration of market transparency have appeared. Therefore, it became the important issue in in North America and Europe how to balance market demand and market transparency for non-open market. Also, there are controvercial discussions about the exchanges' commercialization in that competition among markets that have created a crack in the structure of monopoly can bring about new monopoly through the M&A and liquidity externality and the exchanges' public traget of 'efficient resource allocation through the price discovery function' cannot disappear.

Asia is in the process of paradigm shift. Demand for electronicization and diversification of trading services is increasing and regulation is changing in direction to promote competition among markets. However, since the liquidity gap among countries and the technical capacity among investors is still high, the series of trends such as emergence of alternative trading system, the listing of the exchanges, and M&A seem not to spread rapidly throughout the whole Asia. It is also a problem that institutional investor base is weak.

The Korean stock market is currently in a monopoly. The Korea Exchange to integrate Korea Stock Exchange, KOSDAQ Market, and Korea Futures Exchange, is the sole exchange in Korea and the monopoly status is guaranteed by law. The KRX is equipped with stock company's form, but it is not listed and is operated in the form of public organization. Problems such as high transaction costs, non-diversification services are raised about the Korea stock

market, they seem to be related with the current monopoly status. The transaction cost of the Korean stock market was 28th out of the major exchanges in 2005, but fell down to 38th place in 2008. When considering the size of the economy and the stock market, it is evaluated that considerable inefficiency in the stock trading structure exists.

2. Policy Consideration Factors for Korea exchange industry

The policy target of the exchange's development is mainly at the reduction of transaction costs and the market efficency. When checking global cases which experienced market segmentation and competition, the Korean market should consider the following points:

① Autonomy of market operation should be secured

If autonomy is not given to choic of trading methods, development of order types, the use of marketing techniques, and the change of the commission fee system, there is no competition among markets. Alternative Trading Systems in North America and Europe had many forms to such an extent that no clear classification is possible. It is because they continuously introduce services that can create new demand to meet investor demand. The best autonomy should be given under the principles that the transparency and stability of the market is not hindered and the best investors' protection is guranteed. The reduction of transaction costs and the diversification of services can be made possible by departing from the existing systems.

② The system that virtually integrates divided markets and promotes competition is needed

The principles of best execution practice and market transparency are important here. It is market transparency that makes it possible to compare trading execution conditions between markets and choosing the best profitable conditions is the best execution practice. If fair comparison is not possible or if the best choice is not possible, there is no competition among markets. There is a possibility that the transaction costs increase and the existing monopoly position will be strengthened due to liquidity division. If the two principles are premised, it is the remaining task whether what level of transparency should be and how to judge the best trading execution.

③ Efficient market management system is necessary

As market becames diversified, complex, the possiblity of unexpected impact such as Flash Crash will grow. In order to cope with this situation, market stabilization devices should be introduced to match the change speed of the market. When there was a shock to the market, if the circuit breaker is activated in one market and not in other markets, the market turmoil is clear. Aftermath to analynize the cause of the market shock, consistent order among markets and transactional information are required.

Since integrated information among markets is important to

maintain transparency and is an essential element for effective market management, it should be systematically collected, stored and managed it. Also, management standards for new types of transactions such as high frequency trading should be established. Using advanced technology for trading is good by itself. However, if this may damage the stability of the market, strict management is required for cases involving non-fair trade. If automated trading is accomplished, risk management system for order should be equipped and the market supervision capacity should be improved to block new types of unfair trading behaviors.

VIII. Proposal for Korea capital market development

I think the key words for the Korea exchange's change are **competition** enhancement(reduction of transaction costs), **efficiency**, **fundamental fuction recovery for stakerholders**(companies: provision of financing opportunity/ investors: provision of investment opportunity).

① short term : Switching the KRX to holding company system / mid term : New exchange or ATS entry permission

The essential and urgent key word is competition for The Korea capital marekt. When considering the real things such as assembly situation, the existing organiztion's resistance, I think step by step approach will be better. First of all, the exsiting organization should be switched to holding company which has equal subsidiaries. It is very important to introduce competition to organization. Subsidiaries within the holding company can compete each other. Most of all, performance of each subsidiary should be clearly classified and subsidiaries compete and compensate mutually each other.

Especially, there will be situation of equal competition between KOSPI and KOSDAQ. Also, various administration strategy such as M&A with foreign exchanges, strategic partnership, business diversification through new area pionerring can be propelled. Through division of market surveilance · clearing settlement fuction and sharing of infrastructure, large costs can be saved and interest conflict between profit sector and non-profit sector can be

prevented. As shown in global exchanges cases, many exchanges have holding company organization system considering easiness of stategy partnership · business diversification and administration efficiency.

In Korea, it is evaluated generally that KOSDAQ dose not play a role well to attract venture capital. That is, key function for its establishment is a doubted situation. Any kinds of forms will be good for KOSDAQ if it will be independent from KOSPI. If adopting holding company, the clear blocking between them (KOSPI and KOSDAQ) will be very important. After segmentation, if KOSDAQ cannot do autonomy management innovation, it would be meaningless.

In the mid-term or long-term, if there is social agreement, new exchanges and ATS (alternative trading system) should emerge to the Korea capital market. That is, last step for Korea capital market is to eliminate the existing monopoly system.

2 Competition Enhancement of KOSDAQ

First, KOSDAQ listing enhancement and company portfolio variation efforts should be propelled. Away from the custom to decide whether to allow listing according to company size, KOSDAQ market should make every efforts to attract big good companies. Especially, through listing attraction about innovative technology companies, by gaining the reputation "market for the cutting-edge technology companies" it can secure difference from the KOSPI market and strenghten finace provision function for

those companies.

It also make and reasonalize listing system to cope with flexibly venture compaines' growth pattern, economic environment, changes of marekt demand. It is not just mitigation of listing requirement, but improvement of listing systems and examination methods to screen and attract companies which have growth potential. It can supply overall business consulting from foundation to listing by establishing starting-up support center. Especially, in connection with cloud-funding flatform, it should make pro-cycle structure that sarting-up made through the cloud-funding can be lined to listing.

Secondly, it should develop various products and expand their business areas. KOSDAQ exchange should develop and list stock-linked products(ETF, ETN) which have basic assets such as KODAQ index or stocks. Also, it should develop new representive index to replace the KOSDAQ premier, star index which lose competitive power. By adding bond trading function to KOSDAQ marekt, it can support KOSDAQ listing companies to issue CB, BW. It should enhance the internationalization efforts of KOSDAQ market by expanding the strategic alliance with rapidly growing Asian new markets.

3 IPO Propulsion of the KRX

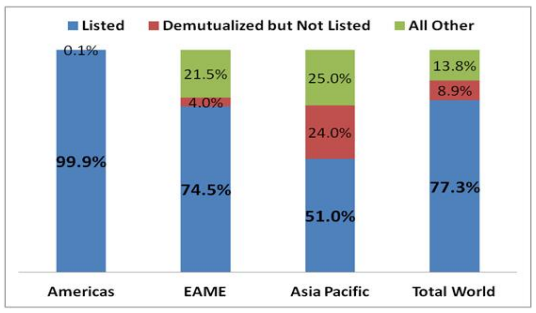
The KRX should need IPO to be away from public organiztion characteristic and compete global exchanges. By switching ownership structure from members to inverstors, it can establish accountability administration culture focusing on the profitability and

can enhance management efficency. Equipped with financing ability through capital increase, it can secure propulsion powers such as M&A · foreign pioneering · new business excavation.

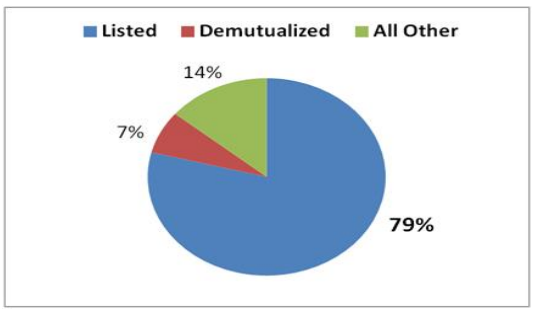
【 The listed exchanges' ratio within global exchanges 】

◈ Most of market value(about 80%) is concentrated on listed exchanges and the listed exchanges' revenue accounts for about 80%

< market value ratio >



< revenue ratio >



4 The exchanges' internalization propulsion

As methods for internalization, the exchange can lead development discussion of co-index and co-product development with Asian major countries. For example, it can propel co-list at asian markets after developing global index and index connection products targeting asia global big companies in connection with asian major countries.

It can strengthen competition through the various products provision

such as foreign good companies's domestic listing and ETF's domestic listing. Also, it can raise Korea derivative market equipped with competiton power as asian hub derivatives market. Through strenghtening strategic alliance such as cross listing with foreign major derivatives markets(CME, Eurex, etc.)

It can propel overseas expansion through M&A, Joint Venture. If it succeed to IPO, it can have capacity to secure large finacing. Based on this capital, it can participate actively global M&A, Joint Venture market. For the exchange industry to expand overseas, it is indispensable to do M&A and co-investment with on-going exchanges which own on-going customers and intermediary networks.

It can also propel to establish co-derivative exchanges at areas which have growth potential of derivative markets and expand global business areas by foreign ATS(Alternative Trading System).

While it propel M&A to enhance business competition of IT infrastructure export parts, it can expand continuously the range of IT infrastructure export area. As shown previous parts, global major exchanges such as LSE, NYSE, HKEx have strenghtened IT services business, information business through the acquisition of IT, S/W companies.

It can also participate global exchanges networks by equity exchanging. If it succeed in IPO, it can evaluate objectively its equity value. After that, by this point, it can propel various strategic alliance such as equity exchanging. It can utilize foreign examples such as equity tradings between JPX-SGX,

NASDAQ-DUBAI EXCHANGE, CME-BRAZIL, TMX-LSE. On the base of this strategy, by enchancing the alliance with foreign exchanges networks, the Korea exchange can join the global exchange market, deviated from isolated areas.

5 Making competition environment

Through the ATS-related deregulation, it can introduce competition system between the regular exchanges and ATS. Trading volume related deregulation can be suggested. If it increase the trading volume limit two times and if this action can be introduced successfully, ATS can participiate and join easily to these markets.

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