The Dynamic Relationship between a Main Investors' Net Long Position and the Trading Volume of KTB Futures Market

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<Abstract>

An analysis on the dynamic relationship between trade volume in the KTB futures market and the net long position of investment companies, foreign investors, and banks was carried out to investigate the relationship among major market participants' net long position and changes in trade volume, and then to use the results in order to derive policy alternative that would make the market bullish for the cases of low trade volume of KTB futures.

Key words: Rate of Return on KTB futures market, Vector Autoregressive model, Granger Causality Test, Impulse Response Function, Forecast Error Variance Decomposition

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I. Introduction

With the Korean government's policy to advance bond market structure and with the rapid growth of the government bond market, Korea Treasury Bond (KTB) Futures was listed on the Korean Futures Market in 1999 and is now being successfully traded. The standards for a successful product in the stock exchange market differ according to domestic economic conditions and stock trade market's strategies across countries. In general, however, if a product is traded at a certain level of volume for a certain time period, then the product is regarded as successful. More specifically, as William Silver (1981) argues, a product is regarded as successful if it is traded, at a volume of at least 10,000 contracts on a daily average basis for three years from the time it is listed. In the years 2002 and 2003, there were cases in which the trade volume dropped sharply enough for one to feel that it is necessary to boost the market.

In this research, we investigate the causality as well as the dynamic relationship between the trading volume of KTB futures and the net long positions of major investors in order to explore for some clues about methods to boost the market when it is slow.

II. Extant Studies and Market Trends of KTB Futures

1. Extant studies

As integration of global financial markets gets more wide and strong, many studies have been devoted to analyze the relationship between financial markets and recently research has become more accurate with more sophisticated models. Numerous studies examined the effects of foreign investments or integration of financial markets. Allen et al. investigated the benefits available to Australian investors from international equity diversification and found evidence of cointegration among a subset of the considered indices. Chen et al. studied the dynamic interdependence of the major markets in Latin America and found the limited potential of diversifying risk by investing in different Latin American markets.

Chan et al. found no evidence of cointegration among the stock indices in Asian

countries and the US. On the other hand, Ghosh et al.'s study showed some evidence of cointegration among stock markets in Asian countries and the US. Arshanapalli et al. observed a significant impact on the markets of the French, German, and UK by US stock market. Pan et al. showed high integration of the US and some Asian stock markets. Alexander found no integration among Asian stock markets but showed existence of Granger causality in these markets. Bhattacharyya et al. examined the existence of integration among stock indices of 11 developed and emerging stock markets and found that all the 11 stock markets are cointegrated. Also, the authors show the profound causality effects in Asian capital markets. Overall the results of the studies mixed and one reason of the results is due to the period under study.

As capital market is getting more and more inter-related among countries, foreign investors' role in a finance market is getting more and more important and the case of Korea is not exceptional. As the history of listing KTB Futures is not so long, the earlier studies on KTB Futures focused on the pricing and pricing related area. Jangkoo Kang and Jungjin Lee (2002) investigate the method of pricing KTB Futures using Black-Karasinski model, Jin-Woo Park and Young-Su Choi (2003) theoretical price estimation using interest term structure, Hu Hwa and Lee Suk-Hwan (2003) empirical study on the arbitrage transaction in Korea Treasury Bond futures market, Sang-Guk Jung (2003) analyze the dynamics between Treasury bond futures price volatility and trade volume and, Jae-Ha Lee and Duck-Hee Han (2002) investigate strategies of arbitrage utilizing Treasury Bond Futures, Bong-Chan Kho and Jin-Woo Kim (2002), examines the impact of the KTB futures options. Chang Hyun Yun, et al. (2002) analyze the dynamic behavior of the volatility of KTB futures price. Young Soo Choi, et al (2004) propose two alternative methods that are used for pricing the theoretical value of the KTB futures on the non-traded underlying asset.

Sang-Kuk Chung (2003) analyzes the dynamics of the price volatility of KTB Futures and the volume of open interest and finds that the trade volume does not have any leading information about price change but has leading effects on the change of the volume of open interest.

The main purpose of this paper is to analyze the causal and dynamic relation between main investors' net long position and the trade volume of KTB Futures to provide basic information that can be utilized to find ways for boosting KTB Futures trading when necessary. Among the main investors, we also pay significant attention to the effects of foreign investors trade patterns in KTB futures market.

2. Recent market trends

The trading volume of KTB Futures culminated in 2002 and since then had reduced until 2005, from which point it has been under recovery. Especially between 2002 and 2005 the trading volume reduced continuously. The volatility of reduced prices coupled with downward stability due to market interest rates and limited market participation by investment companies are presumed to be the main reasons. The price of KTB futures has risen along a steady curve and the trading volume has been under recovery since 2005.

The weight of individual investors for KTB futures is about five percent and that of institutional investors is almost seventy percent. The turn over rate, which is the daily average trading volume divided by the open interest rate is 0.5, which is lower than that of Korea Composite Stock Price Index 200 (KOSPI200) future's turnover rate, 1.5 ~ 2.5. This means that the KTB futures market is settling down as a typical institutional investors' market instead of a short-term investment. As of July 2005, major participants' weights in the KTB futures market are 17.9% for banks, 17.9 percent for securities companies, 17.9 percent for investment companies, 16.8 percent for futures companies, and 9.4 percent for foreign investors.

<Table 1> Trends of KTB Futures Trading and Open Interest Rates

(contract, tick)

	1999	2000	2001	2002	2003	2004	2005.1-7.21
Average daily trading volume (A)	4,415	6,305	37,900	52,369	41,472	30,828	41,555
Average daily open interests (B)	2,990	7,940	31,601	73,458	55,856	79,817	82,500
Turn over rate(A/B)	1.5	0.8	1.2	0.7	0.7	0.4	0.5
Daily price spreads	42	25	52	28	28	20	26.1

<Table 2> Market Participant Trading Volume

	Institution					Futures Co.s	Foreign investors	Individual investors
	bank	Securities Companies	Invest. Co.s	Others	Sub total			
2005	36.7	17.9	17.9	2.8	67.7	16.8	9.4	4.7
2004	34.1	17.4	15.1	3.4	70.0	13.1	12.8	4.5

2003	31.0	11.5	22.3	4.0	68.8	17.2	8.0	6.0
2002	22.7	11.0	29.2	7.1	70.0	16.1	5.1	8.8

Note) Data for the year 2005, is from January 1 to July 21.

III. Research Methodology

The data in this research is the Average Daily Price of Nearby Futures of KTB Futures and the net long position of three institutional market participants' (investment companies, banks, and foreign investors) from September 29, 1999 through July 15, 2005. To analyze the dynamic relations among these variables, we conducted a VAR (Vector Autoregressive Models) model estimation, Granger Causality Test, Impulse Response Function, and Forecast Variance Decomposition. The results of the Augmented Dicky Fuller unit root test considering intercept and time trend show that the null hypothesis that there exists a unit root was rejected at a 1% significance level.

<Table 3> Results of Stationarity Test of Basic Time Series

	ADF	Critical Value(1%)	Critical Value(5%)
Trade vol. of KTB futures	-5.7987	-3.4378	-2.8640
Net long position of investment companies	-18.264	-3.4378	-2.8640
Net long position of foreign investors	-15.018	-3.4378	-2.8640
Net long position of banks	-15.877	-3.4378	-2.8640

Note) n=1,424, 1% level of significant.

1. Estimation of VAR (Vector Autoregressive Models) Model

We employed a VAR(p) model, which can model more than two time series, in order to see what kinds of dynamic relations exist between KTB Futures trading volume and net long position of investment companies, foreign investors, and banks. The vector time series that contains an autoregression is different from a single time series in that, regardless of the endogenous or exogenous variables, it regards all the variables as endogenous variables and contains its own time lags as well as time lags for other variables. There are as many linear regressive equations as the number of variables.

Each variable's current observation value is set as a dependent variable (endogenous

variable) and its own and other variables' past observation values are set as explanatory variables (exogenous variables). The data is computed by using the SC information standard (Schwarz Information Criterion) and selecting 1 as appropriate lag, p. Therefore, Var(1) can be expressed as the following equations.

$$
\begin{aligned}
QUA &= C_{1,1}QUA(-1) + C_{1,2}INV(-1) + C_{1,3}Foreign(-1) + C_{1,4}Bank(-1) + C_{1,5} \\
INV &= C_{2,1}QUA(-1) + C_{2,,2}INV(-1) + C_{2,3}Foreign(-1) + C_{2,4}Bank(-1) + C_{2,5} \\
Foreign &= C_{3,1}QUA(-1) + C_{3,,2}INV(-1) + C_{3,3}Foreign(-1) + C_{3,4}Bank(-1) + C_{3,5} \\
Bank &= C_{4,1}QUA(-1) + C_{4,,2}INV(-1) + C_{4,3}Foreigner(-1) + C_{4,4}Bank(-1) + C_{4,5}
\end{aligned} \quad (1)
$$

In equation (1), QUA represents the trading volume of KTB futures, INV represents the net long position of investment companies, Foreign represents the net long position of foreign investors, and Bank represents the net long position of banks.

2. Granger Causality Test

Using the model estimated by VAR(p), we tested causal relationship among variables by conducting a Granger Causality test. For example, to test the causal relationship between KTB futures trade volume and the net long position of investment companies, the following equation was adopted.

$$
\begin{aligned}
QUA_t &= \Sigma^{p}_{i=1}\ \alpha_i INV_{t-I} + \beta_j\ QUA_{t-j} + u_{1t} \\
INV_t &= \Sigma^{p}_{i=1}\ \delta_i INV_{t-I} + \gamma_j QUA_{t-j} + u_{2t}
\end{aligned} \quad (2)
$$

In equation (2), p represents the appropriate time lag. We investigated the causality between two variables by using a parameter significance test. If $\Sigma^{n}_{i=1}\alpha_i = 0$ and $\Sigma^{n}_{j=1}\gamma_j \neq 0$, it is possible to argue that the trade volume of KTB futures affects the net long position of investment companies.

3. Impulse Response Function

A vector moving average model of stationary vector process x_t with an infinite order is as follows.

$$x_t = \mu + e_t + \psi_t\ e_{t-1} + \psi_2\ e_{t-2} + \text{---} = \mu + \psi(L)e_t \quad (3)$$

In the above equation, put $(\partial x_{t+s} / \partial e_t') = \Psi_s$. Assuming the other error terms of the other times are fixed, the element $\psi^{(i,j)}_s$ that belongs to the ith line and the jth column of Ψ_s tests the effects on the ith variable $x_{i,\, t+s}$ at time t+ s if the error term e_{jt} of the jth variable at time t increases by one unit. When $\psi^{(i,j)}_s$ is expressed as a function of s, it is called impulse response function. However, because covariance matrices obtained from estimations in the VAR model are not in the general diagonal matrices, e_{it} and e_{jt} may show correlation at the present time. In such a case, it is difficult to find the cause of the correlation. In other words it is difficult to determine whether or not the correlation is from the correlation at the present time or from the instances in which an impulse from one variable affects other future variables. Therefore, to avoid indirect effects, we can convert the original error vector e_t to an uncorrelated error vector. By defining n x 1 error vector u_t as $u_t \equiv A^{-1}e_t$, it is possible to posit the expression $Au_t \equiv e_t$. Because e_t is assumed not to be correlated with lag of itself and lag of x_t, u_t is also not correlated with them. Also, we can see that there is no correlation among consisting elements in the converted error vector u_t from the following equation.

$$E(u_t u_t') = (A^{-1})E(e_t e_t')(A^{-1}) = (A^{-1})\Omega(A')^{-1} = (A^{-1})ADA'(A') - 1 = D \quad (4)$$

From equation 4, the (i, j)th element of D then becomes the variable of the newly defined error vector for the ith element of u_{it} . From the sample, we first calculate Ω' and call α_j' jth column of A' which is calculated by Cholesky decomposition. For s = 1, 2, ---, Ψ_s', α_j' are called orthogonal IRF (ORIF). Next we can estimate $\partial x_{t+s} / \partial \mu_{jt}$ by orthogonal IRF, which is similar to IRF. The Impulse Response Function was then found in order to obtain information about the relationship between the trade volume of KTB futures and each investor's net long position more concretely. Here the ordering of variables is such that exogenous variables come first and then variables of the main target analysis come afterward. That is, trade volume of KTB futures which are exogenous variable are located first and then variables of the net long position of investment companies, foreign investors, and banks are located in that order. With a one unit increase in each error term's standard deviation of each variable, the effect on the future paths of the other variables is analyzed. The dynamic response for each variable is designed to be shown for a ten day, time period.

4. Forecast Error Variance Decomposition

Forecast Error Variance Decomposition is employed in order to examine how one

variable's distribution of error term can be explained after a given time by the distribution of other shocks of other variables. Using a VAR model, the Mean Square Error (MSE) for forecasting future time t+ s at time t can be expressed as follows.

$$MSE(Y'_{t+s,t}) = E[(Y_{t+s} - Y'_{t+s,t})(Y_{t+s} - Y'_{t+s,t})'] = \Omega + \Psi_1 \Omega \Psi_1' + \cdots + \Psi_{s-1} \Omega \Psi_{s-1}'. \quad (6)$$

The Forecast Error Variance Decomposition measures how much each elements of orthogonal error u_t is attributable to the Mean Square Error. As we saw, there is the following relationship between the VAR error term and the orthogonal error term.

$$e_t = Au_t = a_1 u_{1t} + a_2 u_{2t} + \cdots + a_n u_{nt}.$$
$$\Omega = E(e_t e_t') = a_1 a_1' Var(u_{1t}) + \cdots + a_n a_n' Var(u_{nt}). \quad (7)$$

Substituting equation (7) into equation (6) and rearranging elicits,

$$MSE(Y'_{t+s,t}) = \Sigma_{j=1}^{n} Var(u_{jt})[a_j a_j' + \Psi_1 a_j a_j \Psi_1' + \cdots + \Psi_{s-1} a_j a_j' \Psi_{s-1}'] \quad (8)$$

where, $Var(u_{jt})[a_j a_j' + \Psi_1 a_j a_j \Psi_1' + \cdots + \Psi_{s-1} a_j a_j' \Psi_{s-1}']$ measures how the orthogonal error affects the MSE of the forecast error after time s. By decomposing and analyzing the variance of the net long position of investment companies, foreign investors, and banks, it is possible to investigate the rate of explanation. Although the Granger causality test elicits useful information on the causal relation among variables, it does not provide information on the relative importance of variables. Thus, it is necessary to investigate the relative importance of how one variable affects other variables through its dynamic transition process by Forecast Error Variance Decomposition. This analysis can support the results of the Impulse Response Function.

IV. Results

1. Estimation of VAR model and Test of the Granger Causality Test

The results from the VAR(1) model estimation are shown in Table 4. However, the VAR model is not a theory-backed structure equation, but rather a recursive equation. Thus, the null hypothesis test based on coefficients estimated from the model is not meaningful. Therefore, we conducted a Granger causality test, Impulse Response Function, and Forecast Error Variance Decomposition. Table 5 shows the results of the

Granger Causality test. For example, the null hypothesis that the investment companies' net long does not affects the KTB Futures trade volume was rejected at a ten percent level of significance. A causal relationship exists between the trade volume of KTB Futures contracts and foreign investors' net long position. Further, foreign investors' net long position has a causal effect on the net long position of investment companies and banks. There is mutual causal relation between investment companies and banks.

<Table 4> Results of VAR(1) Model

	QUA			INV			Foreign			Bank		
	coeff	SE	t-	Coeff	SE	t-	coeff	SE	t-	coeff	SE	t-
QUA (-1)	0.7888	0.0164	47.999	0.0003	0.0017	0.1695	-0.0072	0.0026	-2.7358	0.0035	0.0024	1.4094
INV (-1)	1.0081	0.3522	2.8618	-0.1145	0.0381	-3.0043	0.00885	0.0565	1.5638	-0.1014	0.0534	-1.8962
Foreign (-1)	0.6904	0.3035	2.2749	-0.0226	0.0328	-0.6893	-0.1422	0.0487	-2.9172	0.0664	0.0460	1.4412
Bank (-1)	0.6841	0.3099	2.2074	-0.1269	0.0335	-3.7848	0.0664	0.0498	1.3352	-0.0430	0.0470	-0.9159
C	6534.7	624.11	10.470	-33.868	67.560	-0.5013	244.35	100.27	2.4569	-79.793	94.747	-0.8421

<Table 5> Results of Granger Causality Test

Null Hypothesis(H_0)	F-Value	P value	Causal relation
INV does not affect QUA	2.8100	0.0939	Yes
QUA does not affect INV	0.0536	0.8169	No
Foreign investment does not affect QUA	0.0163	0.8981	No
QUA does not affect Foreign investment	7.9045	0.0050	Yes
BANK does not affect QUA	0.0438	0.8341	No
QUA does not affect Bank	1.7105	0.1911	No
Foreigner does not affect INV	17.272	0.0000	Yes
INV does not affect Foreigner	1.1330	0.2873	No

BANK does not affect INV	31.304	0.0000	Yes
INV does not affect BANK	17.083	0.0000	Yes
BANK does not affect Foreign investment	0.0895	0.7648	No
Foreign investment does not affect BANK	14.969	0.0001	Yes

Note) Data is from 1,424 observations with a one-day lag, and the results are at a 10% level of significance.

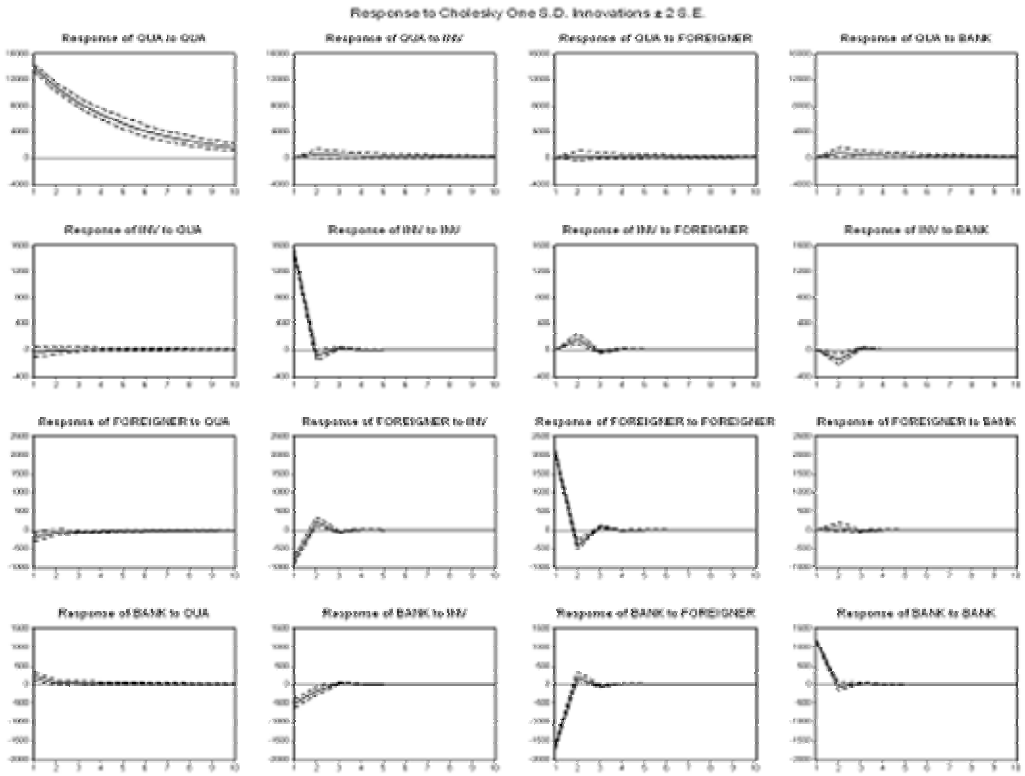
2. Results of Impulse Response Function and Forecast Error Variance Decomposition

The results obtained from the Impulse Response function showing the relative importance among variables are shown in Diagram 1 and Table 5. In Table 5, Impulse Response Results are expressed in numbers with, responses in five day increments instead of ten day increments. When there is an impact that causes a change of one standard deviation to the net long position of the investment companies, foreign investors, and banks, there was no response after one day, but after two days there was a positive response after which the degree gradually decreased. The most sizable fluctuations were felt at banks, to investment companies, and by foreign investors, respectively. Trade volume in futures market responds to its own impact

When there was a change of one standard deviation in the net long position of trade volume of KTB Futures and net long position of foreign investors and banks, the net long position of investment companies showed no response after one day except concerning impacts on trade volume. After two days, there was a positive impact on foreign investors' net long position, and a negative response to bank's net long position. Concerning impacts on investment companies' net long position, results showed the biggest response after one day, but after two days the response to the net long position of foreign investors and banks was bigger.

Concerning the net long position of foreign investors, there was a negative response to the net long position of investment companies and trade volume after one day but there was no response to the net long position of banks. Concerning the net long positions of banks, there appeared a big response to trade volume of futures contracts as well as the net long position of foreign investors and investment companies in 1 day. Banks' net long position responded more to foreign investors' net long position than its own impact after one day.

<Diagram 1> Results of Impulse Response at VAR(1)



<Table 6> Table of Results of Impact Response

Response of QUA				
Date	QUA	INV	Foreign	Bank
1	13712	0.0000	0.0000	0.0000
2	10800	598.46	300.62	799.66
3	8482.9	405.73	263.91	500.36
4	6670.0	333.71	194.86	410.98
5	5243.2	259.25	156.90	320.05

Response of INV				
Date	QUA	INV	Foreign	Bank
1	-31.886	1484.0	0.0000	0.0000
2	-15.170	-86.390	160.41	-148.42
3	2.6063	28.255	-35.426	21.880

4	-0.5267	-0.0266	8.6989	-4.8004
5	0.1945	1.3920	-2.0290	1.0438

Response of Foreign				
Date	QUA	INV	Foreign	Bank
1	-189.17	-786.44	2049.2	0.0000
2	-60.697	208.76	-399.81	77.714
3	-68.756	-53.661	82.619	-33.317
4	-48.990	9.3649	-20.163	4.7370
5	-39.694	-4.7020	3.0412	-4.3173

Response of Bank				
Date	QUA	INV	Foreign	Bank
1	214.54	-518.24	-1628.7	1168.7
2	29.641	-180.38	206.28	-50.372
3	34.208	32.503	-50.652	25.194
4	23.524	-6.4031	12.190	-3.7578
5	19.240	2.6825	-2.0613	2.4085

In summary, the net long position of investment companies, foreign investors, and banks does not affect the trade volume of KTB futures immediately, but some effect appears after two days. Impact response of the net long position of investment companies does not affect the net long position of foreign investors and banks immediately, but there is a big response after two days. The net long position of foreign investors responded to impacts on the net long position of investment companies and the trade volume of KTB futures immediately after one day. Especially, the trade volume of KTB futures affects changes in the net long position of foreign investors. The net long position of banks responded to net long position of foreign investors greatly after one day and to other investors' trade with significant causal relation. Bank's investment pattern can be said relatively conservative.

In Table 4, the degree of change in the variance of error terms of trade volume in the futures market can explained by the variance of error terms of other variables after 10 days is shown in numbers. That is, of the degree of variances of the variables shown in the left column are explained by the variances of the variables shown in the following columns and are written as numbers. For KTB futures, almost 99% of the Forecast

Error Variance is explained by variance of trade volume itself, 0.2% is explained by variance of net long position of banks, 0.1% is explained by variance of the net long position of investment companies. For the net long position of investment companies, about 1.19% of Forecast Error Variance is explained by variance of the net long position of foreign investors and about 97.7% of it is explained by that of itself. For the net long position of investment companies, although low level, the Forecast Error Variance is explained by variance of the net long position of foreign investors. Concerning the net long position of foreign investors, about 85.7% of the Forecast Error Variance is explained by variance of the net long position of itself, and about 13% is explained by that of the net long position of investment companies. This result indicates that impact of net long position of investment companies is reflected in the net long position of foreign investors. The variance of the net long position of banks is explained by almost twice of variance of the net long position of foreign investors than the variance of itself, which means that the net long position of banks is influenced the most by that of foreign investors.

<Table 7> Results of Variance Decomposition

	QUA	INV	Foreigner	Bank
Variance Decomposition of QUA	99.517	0.1629	0.0525	0.2670
Variance Decomposition of INV	0.0554	97.751	1.1968	0.9962
Variance Decomposition of Foreign	0.9914	13.068	85.798	0.141
Variance Decomposition Bank	1.1209	6.8387	61.055	30.984

V. Conclusion

In this research, an analysis on the dynamic relationship between trade volume in the KTB futures market and the net long position of investment companies, foreign investors, and banks was carried out. The purpose was to investigate the relationship among major market participants' net long position and changes in trade volume, and then to use the results in order to derive policy alternative that would make the market bullish for the cases of low trade volume of KTB futures. Using data from September 1999 through July 15 of 2005, we estimated the VAR model and conduct a Granger Causality Test, an Impulse Response Function, and a Forecast Error Variance Decomposition in order to find out if there is a dynamic relationship among the variables and then analyzed the relative importance of the variables in.

The summary of the analyses is as follows. First, although little, the net long position of investment companies has a positive influence on the trade volume of KTB futures. That is, the sharp drop of trade volume of KTB Futures in 2003 and 2004 reflects the fact that increased demands of short covering of credit funds due to the SK scandal and credit card problems after 2002 lowered the level of trust money of investment companies, which in turn reduced the investment capabilities and thus led to a shrinkage in trade volume.[1]

Secondly, foreign investors' net long position also decreases, however little, when the trade volume decreases. This indicates that the trade pattern of foreign investors is influenced by the trade volume of futures market. Also, the net long position of foreign investors affects the net long position of investment companies and banks. Although the net long position of foreign investors does not lead the market, foreign investors do position their investment when the market is full of liquidity.

Thirdly, banks, as trading partners of many institutional investors maintain presumably conservative trading patterns and are influenced by the net long position of foreign investors the most and also have close bilateral relations with investment companies. Concerning other futures contracts, banks participate in futures market carefully.

Based on the findings we can suggest policies to promote KTB Futures trade when it is slow. First, strong marketing to bolster market participation of investment companies is necessary. At present, there is limit on derivatives of security funds. Security indirect investment institution not derivatives indirect investment institution are limited to 10% of the total assets of indirect investment in trading derivatives and the estimated amount of risk is evaluated based on nominal amount of contracts. All this limitation incites investment companies to trade KTB Future actively and thus needs revision. Active participation of investment companies in KTB Futures market can influence increased trade volume. Secondly, it is necessary to allow foreign investors to increase their participation in the market. At present, investors in the US have no way to invest directly in bond derivatives in stock and derivative market in Korea and have to invest in indirect ways. It is necessary to get Assignment of Exempted Securities for KTB cash price from SEC in order to provide greater access to foreign investors who want to invest in Korean stock market. If that happens, more investors from other countries

[1] The scandal surrounding a 1.5 trillion won accounting fraud at South Korean trading firm SK Global hit Korean investment market.

will invest more in KTB futures and in turn more institutional investors in Korea will participate in KTB futures trade.

Fourthly, the domestic futures market has few participants and their market participation is not active, so it is necessary to revise the regulations for banks and other institutions are able to participate in the market as members in addition to futures securities companies.

This research paper focused on daily data, so explanations on intraday dynamic relationship is not possible. In future research, using more finite time series data is necessary to explore for intraday dynamic relationships based on the market condition. Also, various methods for promote the market should be adopted.

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