MARKET SEGMENTATION AND STOCK PRICE : THAI STOCK MARKET

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Abstract

This study attempts to explain the foreign premium of foreign stock relative to domestic stock by three hypotheses which are demand differential, information availability, and diversification benefit. The panel regression is employed. The results of the study yields that only demand differential hypothesis is significant. The downward trend of foreign premium during 2002 to 2014 can be explained by looser foreign ownership limit and the existence of NVDR as substitute of domestic stock.

Keywords: Market segmentation / Stock price / Thai stock market

Introduction

One of the investment barriers between countries, especially in the emerging market, is the foreign ownership restriction on the domestic stocks. The restriction leads to the segmentation of the domestic capital market between foreign investors and domestic investors (Domowitz, Glen, & Madhavan, 1997; Lau, McCorry, & McInish, 1997) this yields the price difference between equity classes of identical stock. Most of the unrestricted shares are traded at premium relative to restricted shares excluding the case of Chinese stock market whose its unrestricted shares are traded at discount (Bailey & Jagtiani, 1994; Bergström & Tang, 2001; Domowitz et al., 1997; Ødegaard, 2007; Stulz & Wasserfallen, 1995; Sun & Tong, 2000). The previous studies attempted to explain this price premium of unrestricted share (foreign share) both cross-sectional and time-series variation by several theories and hypotheses. (Bailey & Jagtiani, 1994; Bergström & Tang, 2001; Chakravarty, Sarkar, & Wu, 1998; Domowitz et al., 1997; Ødegaard, 2007; Stulz & Wasserfallen, 1995; Sun & Tong, 2000)

Turning to consider the Stock Exchange of Thailand (SET), the premium of foreign share on the Foreign Board relative to local share on the Main Board has been primarily exist as in the study of Bailey and Jagtiani (1994) during 1988 to 1992. Nevertheless, the environment of Thai capital market has been changed much during several decades, these are likely to significantly influence the foreign premium. Thus, this study aims to investigate that whether the price difference between foreign share and local share in Thai stock market can be explained by (i) the demand differential hypothesis which relates to the change in regulation of foreign ownership limit and NVDR (the new investing instrument introduced to the market), (ii) information availability hypothesis studying on the change in market capitalization of each stocks, and (iii) diversification benefit hypothesis focusing on the correlation between local stock return and region return index. Lastly, this study mainly contributes the up-to-date empirical evidence of market segmentation and stock price in Thai capital market accounted for the environmental changes in both internal and external factors.

Literature Review

Institutional Data

Owning to the large flow of foreign direct investment and portfolio investment into Thailand in mid-1980s, most shares have reached their foreign ownership limit and were harder to trade by foreign investors, since if they want to purchase shares that hit foreign limit, they have to queue up until other foreign shareholders sold those shares and result in loosen foreign limit (Bailey & Jagtiani, 1994). Thus, in 1987, The Stock Exchange of Thailand (SET) introduced the Foreign Board where allows foreign investors to trade the shares that have reached their foreign limit, among foreign investors, they are able to register those shares for their own name and receive full financial benefits including dividend, voting rights, as well as other right offerings. Later, to encourage trading activities on Thai stock market under the foreign ownership limit regulation, the Non-Voting Depository Receipt (NVDR) was introduced on June 11, 2001 as the new instrument issued by Thai NVDR Company. By trading NVDR, it provides identical financial benefits as trading ordinary shares but the voting-right and the involvement in corporate decision-making are not allowed. Also, both domestic and foreign investors can trade NVDR on the Main Board and apply the same trading procedure as trading of ordinary shares at the same price of local share on Main Board, this facilitates the foreign investors who do not interest in voting-right but other financial benefits, since they do not have to concern about the foreign limit unlike trading foreign shares (Thai NVDR CO., 2014).

Relevant Theories, and Development of Hypotheses

Hypothesis I : Demand differential hypothesis

- The foreign downward-sloping demand

Bailey & Jagtiani (1994) who studied the foreign ownership restriction and stock price in Thai capital market, found that the higher foreign demand shares with tighter foreign ownership limit are correlated with higher foreign share premium. They suggested that the foreign demand for Thai stock is downward-sloping. Also, it is likely to have the negative relationship between the foreign rooms available and the foreign share premium, since low foreign room available indicates high relative demand for that share and hence, high foreign premium. Similarly to the case of Nestle share price in Switzerland stock market, which its unrestricted share price premium was lower after its announcement of foreign ownership relaxation due to the downward-sloping demand of foreign investors for unrestricted share (Stulz & Wasserfallen, 1995). Also, the evidence from Mexico indicated that the inadequate relative supply of unrestricted share is significantly negative to its share premium, moreover, these premium are found to vary widely across individual firms and over time (Domowitz et al., 1997). Besides this, Ødegaard (2007) found the price difference between Norwegian equity classes which are F share and A Share. Both of them are full voting right, but only F shares are unrestricted to foreign investors and traded at premium. Thus, the hypotheses of the study are as follow,

Hypothesis I(a): The foreign ownership limit of domestic stock has negative relationship with the premium of foreign share price, since the foreign investors' demand is downward-sloping.

Hypothesis I(b): The foreign room available of domestic stock has negative relationship with the premium of foreign share price, since the foreign investors' demand is downward-sloping.

- The differential demand elasticities

The differential demand between local and foreign investors which arises from the varied deadweight cost, for instance the political risk, taxes, across countries, induces the price discrimination between them. This differential demand also represents the different demand elasticities to the identical domestic stock (Stulz & Wasserfallen, 1995). One of the determinants of demand elasticities is the number of substitutes which are available, more substitutes of foreign shares will cause the foreign investors' demand become more elastic than before and the premium of foreign share price to be lower. Similarly, the presence of H shares and redchips in the Stock Exchange of Hong Kong cause the larger discount of B share price which is unrestricted share, relative to A share which is restricted share in Chinese market, since H shares and redchips are viewed as substitute of B shares (Sun & Tong, 2000).

Based on this idea, NVDRs can be seen as a partial substitute of foreign share on the Foreign Board in Thai capital market since it yields all identical financial benefit to foreign investors as holding foreign share except the voting-right. Therefore, it can be hypothesized that

Hypothesis I(c): The existence of NVDR has negative relationship with the premium of foreign share price, since the foreign investors' demand become more elastic by substitutes.

Hypothesis II : Information availability hypothesis

French & Poterba (1991) stated that foreign investors will avoid to invest in assets they have limited information and, or experience. Several studies found that the foreign investors prefer to invest in large well-known firms rather than small firms (Bailey, Chung, & Kang, 1999; Bailey & Jagtiani, 1994; Kang, 1997) because these firms tend to have more information availability which can be more easily acquired by foreign investors, and more analyst coverages (Sun & Tong, 2000). Therefore, the firm size is appropriate proxy to investigate the information availability hypothesis. And it is likely to observe the larger firm with higher foreign premium in Thai capital market.

Hypothesis II : The firm size has positive relationship with the premium of foreign share price, since foreign investors have preference over the firms of more information availability which tend to be the larger firm.

Hypothesis III : Diversification benefits hypothesis

One of the important motives of the cross-border investment is diversification benefit. As the previous study of Bailey et al. (1999) found that investors will be willing to pay a premium for international diversification. Thus, the more offering diversification benefit of the unrestricted share, the higher price premium of it, the exception is in Chinese stock market where the unrestricted B shares are traded at discount relative to the restricted A share, however, Bergström and Tang (2001) found that the B share discount relative to A share in Chinese market is negatively associated with the diversification benefit offering by B share, since according to portfolio theory, asset yields diversification benefit when its return is less than perfectly correlated with portfolio or market return. As higher correlation between asset return and market return, as lower diversification benefit it has, consequently, investors will require higher return on it, and thus, lower price. If this is the case, we should see the negative relationship between the correlation of foreign stock return and market portfolio return, and foreign premium.

Hypothesis III : The correlation between foreign stock return and the benchmark of region stock market return has negative relationship with the premium of foreign share price, since positive highly correlated stock shows the lower diversification benefit and the higher require return on foreign stock by foreign investors, hence, lower foreign price premium.

Data and Methodology

The Dependent Variable

To obtain foreign premium, it requires the close price at each month end of each foreign and local shares in the Stock Exchange of Thailand (SET) during January 2002 to December 2014, 156 months. However, not all listed stocks are traded on the given day, only stocks providing a pair of contemporaneous share price between Foreign Board and Main Board which indicates the positive trading volume are used (Bailey & Jagtiani, 1994), and stocks having only one observation will be dropped out from the sample. The foreign premium for firm i on month t is calculated as follow.

$$PREM_{it} = \left(\frac{Foreign\ Share\ Price_{it} - Main\ Board\ Share\ Price_{it}}{Main\ Board\ Share\ Price_{it}}\right)$$

The Explanatory Variables

According to the hypotheses, these explanatory variable are derived and computed on monthly basis, *(i)* $FLIMIT_{it}$, is the percentage of foreign ownership limit of firm i on month t as determined by law or company regulations, *(ii)* $FROOM_{it}$, is the percentage of foreign room available relative to foreign ownership limit of firm i on month t, *(iii)* $NVDR_{it}$, is the dummy variable represented the existence of NVDR of firm i on month t, *(iv)* $MCAP_{it}$, is the proxy for firm size of firm i on month t measured as the percentage of market capitalization of firm i on month t to the market capitalization of total market on the same month, multiplied by 100, and *(v)* $CORR(R_{it}, RMSCI_{it})$ represents the diversification benefit of investing in foreign shares on Thai stock market, it is measured by the correlation between total return index of foreign share of firm i on month t (R_{it}) and MSCI AC Far East ex Japan[1] return index on month t ($RMSCI_{it}$) as a benchmark (Bergstrom & Tang, 2001).

Methodology

To investigate the hypotheses discussed above, the panel-data model is employed since the hypotheses above concern both factors that varied over time and across firm (Domowitz et al., 1997). Equation (1) is estimated by the fixed-effects method to capture unobservable firm effects which are time-invariant. Also by Hausman Test, the rejection of null hypothesis means the fixed effects is more properly used than random-effects methods (Wooldridge, 2013)

$$PREM_{it} = \beta_1 FLIMIT_{it} + \beta_2 FROOM_{it} + \beta_3 NVDR_{it} + \beta_4 MCAP_{it} + \beta_5 CORR\,(R_{it}, RMSCI_{it})_{it} + \beta_6 PREM_{it-1} + \varepsilon_{it} \quad (1)$$

where, $PREM_{it}$ represents the foreign share price premium for firm i on month t, each β is coefficients associated with observable explanatory variables, $PREM_{it-1}$ is time lag of $PREM_{it}$ included to filter out a high degree of auto-correlation as in Domowitz et al. (1997), Bailey et al. (1999), and Sun & Tong (2000). $NVDR_{it}$ is the dummy variable which has the value of zero or 1, α_i is time-invariant random variable used to capture any other cross-sectional effects since the unobservable firm-specific effect is controlled (Domowitz et al., 1997; Sun & Tong, 2000), and, ε_{it}, is the disturbance term assumed to have zero mean and uncorrelated with X_{it}, however, it may be heteroscedastic (Wooldridge, 2013).

Results and Discussion

Descriptive Statistics

Figure 1 shows monthly average share premium during January 2002 to December 2014, 156 months and 58 companies [2]includes in the samples. It exhibits the downtrend of foreign premium which has gradually lower until reaches zero in 2007 and become firstly negative (foreign discount) in 2008.

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[1]MSCI AC Far East ex Japan is the index captures large and mid-cap representation across 2 Developed Markets countries (excluding Japan) and 7 Emerging Markets countries in the Far East. With 535 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each countries (MSCI, 2014).

However, there is highly fluctuating during the sample period.

The pairwise correlation is conducted and it can be concluded that there is no multicollinearity problem detected among explanatory variables. The preliminary characteristics of variables are shown in Table 1. Values are calculated as percentage on monthly basis during January 2002 to December 2014. For whole samples average *Foreign Premium* is 3.37%, however, there is a wide range from -88% (in 2008) to 72.41% (in 2002). To consider explanatory variables, begin with *Foreign Limit,* it has been adjusted by regulation to become higher respect to each stock during the sample period. The ownership limit allowed is 100% at maximum and 12.5% at minimum. Similarly, *Foreign room* available relative to foreign limit is 2.53% on average which is very low exhibiting the high foreign demand for foreign share. Next, *NVDR* as the substitute of foreign share is the dummy variable which will be valued at 1 if there is NVDR and 0 otherwise, the mean value is close to 1 meaning NVDR is available for most stocks. Another*, Market Capitalization* of each stock also changes overtime, stock size included in the sample range between 9.92% and 0.0031% of the market capitalization of total market. Lastly, *Correlation* between foreign share return and MSCI return illustrates the diversification benefit by the large negative correlation is preferred, however the average value of correlation is positive at 30.20%.

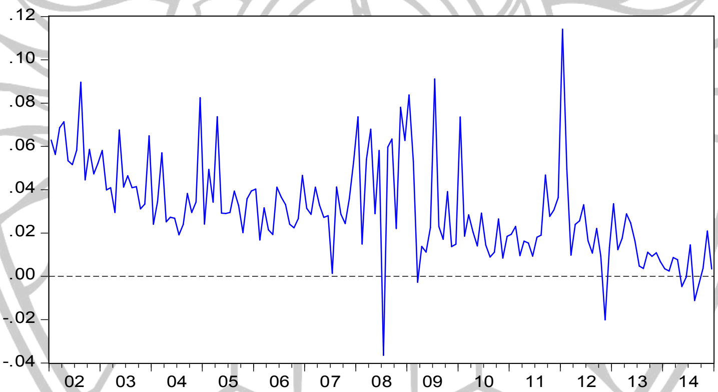

Figure 1 : Monthly Average Premium

[2] The previous studies in this area have small sample size, Bailey and Jagtiani (1994) considered 27 Thai firms, Stulz and Wasserfallen (1995) considered 19 Swiss firms, Domowitz et al. (1997) considered 21 Mexican firms.

The firms in this sample study are ADVANC, AJ, AP, ATC, BANPU, BAY, BBL, BDMS, BECL, BH, BIGC, BLAND, BTS, CPF, CPN, DELTA, EGCO, GOLD, IFCT, INTUCH, IRPC, ITD, JAS, KBANK, KCE, KGI, KKP, KTB, LH, LPN, MFG, MINT, PSL, PTTEP, QH, RCL, RML, ROBINS, SAMART, SCB, SCC, SCCC, SCIB, SE-ED, SPALI, SSC, STEC, TCAP, THAI, THCOM, THRE, TMB, TPP, TRUE, TTA, TUF, UBC, and UCOM.

Table 1 Descriptive statistics of variables (values are calculated as percentage on monthly basis)

Variables	Mathematical representation	Mean	Median	Maximum	Minimum	Std. Dev.
Foreign Premium	$PREM_{it}$	0.033675	0.013245	0.724138	-0.88	0.074974
Foreign Limit	$FLIMIT_{it}$	0.382640	0.400000	1.000000	0.125000	0.101597
Foreign Room	$FROOM_{it}$	0.025381	0.000000	0.436418	0.000000	0.059278
NVDR	$NVDR_{it}$	0.953134	1.000000	1.000000	0.000000	0.211413
Market Capitalization	$MCAP_{it}$	0.020997	0.015359	0.099169	0.000031	0.018086
Correlation	$CORR(R_{it}, RMSCI_{it})$	0.302050	0.309587	0.888008	-0.599828	0.252960

Test results

Table 2 Panel regression results for the whole samples

Factors and proxies/Model	Expected Sign	Model (1)	Model (2)
Constant term		0.050432 (4.436673)***	0.052349 (4.785222)***
Foreign Limit	–	-0.036998 (-2.281068)**	-0.043499 (-2.802881)***
Foreign Room	–	-0.023222 (-0.819808)	
NVDR	–	-0.021585 (-2.323268)**	-0.019922 (-2.196295)**
Market Capitalization	+	0.102116 (1.129677)	
Correlation	–	-0.001740 (-0.273827)	
$Premium_{it-1}$		0.490296 (23.32973)***	0.492069 (23.49295)***
Adjusted R^2		0.263678	0.264111
Durbin-Watson		2.045091	2.042656

T-statistics are shown in parentless.

** Significance at 5%

*** Significance at 1%

Table 2 shows the panel regression results which Equation (1) is estimated by fixed-effect method. While Model (1) includes all explanatory variables, Model (2) includes only significant variables. The coefficients of each variable yield expected sign and foreign premium can be significantly explained by *Foreign Limit* and *NVDR* but *Foreign Room, Market Capitalization*, and *Correlation*.

$$PREM_{it} = \beta_1 FLIMIT_{it} + \beta_2 FROOM_{it} + \beta_3 NVDR_{it} + \beta_4 MCAP_{it} + \beta_5 CORR\,(R_{it}, RMSCI_{it})_{it} + \beta_6 PREM_{it-1} + \varepsilon_{it} \quad (1)$$

According to *Hypothesis I : Demand differential hypothesis*, when the foreign ownership limit is tighter, the foreign premium is higher. In this study, the foreign ownership limit of some stocks are regulated to be higher during the 2002 to 2014, it explains the downward trend of foreign premium illustrated in Figure 1. Thus, the foreign investors' demand to Thai stock is downward sloping. This is consistent with Bailey & Jagtiani (1994), Stulz & Wasserfallen (1995), and Domowitz et al., (1997). On the other hand, when the foreign room is lower, it indicates the higher demand and higher premium of foreign share, however this variable is statistically insignificant. Another, since the elasticities demands of foreign investors for domestic stock are relatively inelastic than domestic investors, they would pay higher for the identical stock. Nevertheless, when NVDR viewed as the partial substitute of domestic stocks is introduced in 2001 and increasing in number overtime, the foreign investors' demand become relatively elastic than before, hence, the foreign premium is gradually lower. If this is the case, when the foreign ownership is looser and NVDR can be perfect substitute for domestic stocks, the foreign premium is likely to disappear overtime.

For *Hypothesis II : Information availability hypothesis*, market capitalization or firm size represents the information availability, large firm sizes have more information availability and more preferred to foreign investors, thus, should have high foreign premium. According to the test result, firm size or information availability fails to explain the foreign premium, this is inconsistent with Bailey and Jagtiani (1994) who study the foreign premium during January 1988 to December 1992.

Another, *Hypothesis III : Diversification benefits hypothesis*, highly positive correlation between domestic stock return and region stock return index indicates lower diversification benefit of investing in domestic stock, hence, lower foreign premium. However, this hypothesis is unable to explain the foreign premium in this study.

Apparently, both Model (1) and Model (2) are similar, the latter shows a bit higher adjusted R^2 than Model (1). However, the adjusted R^2 is only around 26% meaning that there are other variables else that can explain the foreign premium.

Conclusion

Demand differential hypothesis plays important roles to explain the foreign premium during 2002 to 2014, while the Information availability hypothesis and Diversification benefit hypothesis cannot. During the sample period, the foreign premium exhibits the downward trend which is consistent with the looser foreign ownership limit indicating more supply of domestic stock and the coming of NVDR as the substitute of domestic stocks. To compare with the previous study of foreign premium in Thai stock market by Bailey & Jagtiany (1994) during 1988 to 1992, the foreign premium was averagely higher than during 2002 to 2014 which is the sample period of this study. It implies that foreign premium in Thai stock market has been lower overtime. Also, they found that foreign limit, liquidity, information availability, differences in risk exposures and expected risk premiums, are correlated with the foreign premium. However, in this study, foreign limit is significant but information availability is not.

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