Ownership structure, liquidity, and firm value: Effects of the investment horizon

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Abstract

A firm's ownership structure influences both its liquidity and value. This paper investigate the above relation by introducing a new measure of latent investment horizon, a weighted average investment horizon computed from the firm's ownership structure and the average investment horizon of various investor categories. We find that the latent investment horizon explains differences in liquidity and firm value among firms listed on the Tokyo Stock Exchange. Empirical results indicate that the longer the investment horizon, the lower the firm's liquidity and value. In addition, concentrated ownerships by insider and cross-holding shareholders can lead to inferior liquidity and firm value.

JEL Classification: G10, G32
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1. Introduction

This paper investigates how ownership structure is related to a firm's market liquidity and value. If the market liquidity of the firm's shares declines due to concentrated ownership, the value of the firm is expected to decrease. According to Bhide (1993) and Holmstrom and Tirole (1993), illiquidity may result from increased asymmetric information. On the other hand, large shareholder faces liquidity constraint to unwind her holdings so that she ought to strengthen monitoring the firm's management and contributes to increase a firm's value. There is a trade-off between illiquidity and level of corporate governance.

Maug (1998) and Kahn and Winton (1998) suggest that greater liquidity can be an opportunity for large shareholders to increase their profit by monitoring the firm's management. They mention the case where a large shareholder chooses to buy more shares when the firm's performance is expected to improve as a result of monitoring activities. The greater the liquidity, the more shares can be bought in the market due to lower transaction costs. Thus, a higher concentration of ownership does not necessarily mean a trade-off between corporate governance and illiquidity. This differs from past views such as in Bhide (1993), where a stock's high liquidity renders large shareholders less aggressive in their monitoring and more likely to sell shares when they find poor performance of the firm's management.

Thus prior theoretical literature address the impact of concentrated ownership on a firm's market liquidity and value, but does not consider shareholders' investment horizons which differ substantially among shareholders. When a firm has many shareholders with a longer (shorter) investment horizon, its market liquidity diminishes (increases). In this study we

investigate the relation between the average investment horizon of the entire ownership and a firm's liquidity as well as value that Amihud and Mendelson (1986) predicts.

Atkins and Dyl's (1997) study on the relation between investor average holding period and liquidity is similar to ours. They find a strong correlation between a stock's share turnover and bid-ask spread. Our paper differs from theirs in the following regards.

First, we use the latent investment horizon instead of turnover. Turnover, the authors' proxy for the shareholders' investment horizon, is observed ex post and therefore deviates from the ex ante average holding period of the firm's ownership structure, because turnover is largely affected by short-term trading activity and informational events such as quarterly reports and takeover bids. Our paper focuses on how ownership structure affects stock liquidity. We need a proxy for the ex ante average holding period of shareholders that is not computed from a realization of mixed trading interests. Second, we use a liquidity measure such as Amihud's (2002) *ILLIQ* in addition to the bid-ask spread. ILLIQ is reflected by not only the bid-ask spread but also market impact and thus represents a wider scope of liquidity, which is relevant for both small individuals and large institutional investors as an indicator of transaction cost.

For the ex ante investment horizon, this study calculates a weighted average investment horizon of a firm's shareholders for Japanese companies listed in the First and Second Sections of the Tokyo Stock Exchange (TSE). We follow Mahanti et al. (2008), who were the first to use latent liquidity to estimate transaction cost of corporate bonds. In their study, the authors estimate the investment horizon of corporate bondholders using data from custodian banks. In our case, however, there are no corresponding data available from custodian banks. Therefore, we estimate the latent investment horizon of each stock from the ownership ratio

and the market wide investment horizon of investor category, such as foreigners, banks, and individuals. The average investment horizon of each investor category is computed from the aggregate amount of the holding and the total trading volume of TSE-listed companies.

By considering the average investment horizon of the ownership structure, we can address cases in the real economy where, under the same concentrated ownership, a firm's market liquidity and value are higher because the weighted average investment horizon of its shareholders is shorter than others. We show that a firm's weighted average investment horizon is highly correlated with market liquidity and firm value. We expect that the shorter the investment horizon, the higher the liquidity and value of the firm. Additionally, there are two distinct categories of large shareholders in Japan: foreigners and cross-holders (mochiai). These investors are opposites in terms of investment horizon and monitoring management. We shed some light on specific investor categories and whether the size of their presence affects firm liquidity and value.

Our results are summarized as follows: (1) The longer the latent investment horizon, the lower the liquidity. (2) Longer investment horizon leads to lower firm value. (3) Investor category has a distinct effect on liquidity, with foreigners impacting positively and cross-holders negatively. The results imply that ownership structure relates to a firm's liquidity and value. Our results indicate that the higher the proportion of short horizon shareholders, the higher the firm's liquidity and value. On the other hand, a firm with a high proportion of infrequent investors who do not monitor management and facilitate the entrenchment of current management results in lower firm liquidity and value. Based upon these results, strengthening cross-holding is an inferior corporate policy, since it ultimately impairs the liquidity of the entire market.

The remainder of this paper is organized as follows. Chapter 2 proposes a new approach to the relation between ownership and liquidity, with a brief overview of previous work. The data and sample stocks are described in Chapter 3. Chapter 4 presents our empirical results and Chapter 5 gives our conclusions.

2. A New Approach and Hypotheses

2.1 Prior research

A firm's ownership concentration influences its liquidity and value. We argue that the manner in which ownership structure affects liquidity depends upon a weighted average investment horizon of the firm's shareholders. If the average investment horizon of the firm is longer, then the illiquidity of its shares is more severe.

Amihud and Mendelson (1986) model predicts that illiquid stocks are owned by investors with longer investment horizon. If these investors do not actively monitor a firm's management and they do not trade, the firm's share liquidity remains low. As suggested by Maug (1998), and Kahn and Winton (1998), if a firm's shareholders commit to monitoring management, they trade frequently to maximize their profits from their private information and thus contribute to improve the stock's liquidity.

Bhide (1993) and Holmstrom and Tirole (1993) demonstrate a negative correlation between ownership concentration and firm liquidity. When the founding shareholder owns all of a firm's shares, there is no liquidity. If the founding shareholder sells off a small part of the shares, liquidity improves but monitoring incentives are decreased gradually. This is due to a free rider problem in which minority shareholders enjoy the monitoring efforts of a large shareholder. On the other hand, the informational advantage of large shareholders who

commit to monitoring increases information asymmetry among investors, causing lower liquidity. Thus, a trade-off exists between liquidity and monitoring. Neither of the authors considers the investment horizon of the firm's shareholders.

Kahn and Winton (1998) and Maug (1998) argue that large shareholders might not release their ownership when market liquidity is high. While a large shareholder continues monitoring management to improve the firm's value, more shares can be bought to maximize profit. The decision on how many shares to add depends upon market liquidity or transaction costs. The authors also point out that for monitoring to remain profitable, it is crucial that the monitoring information be accurate. They do not, however, examine the investment horizon of large shareholders.

A small number of empirical studies have been carried out on the trade-off between liquidity and corporate governance. Gaspar and Massa (2007) empirically examine the trade-off between monitoring and liquidity. They show that informed ownership improves governance and induces value-enhanced decisions, but reduces liquidity due to increased adverse selection cost. Rubin (2007) finds that liquidity is positively correlated to total institutional holdings but negatively correlated to institutional block holdings. The level of institutional holdings proxies for trading activity, and the concentration of ownership, such as block holdings, proxies for adverse selection costs. Sarin and et al. (2000) analyze ownership concentration by insiders and by institutional investors. They report decreased liquidity in both cases: by insiders from increased asymmetric information and by institutional investors from inventory costs. Garvey and Swan (2002) empirically verify Holmstrom and Tirole's (1993) hypothesis with a sample of 1,500 U.S. companies and report that high liquidity has a positive impact on shareholder value.

Atkins and Dyl's (1997) study, which is similar to ours, on the relation between investor average holding period and the bid-ask spread for NASDAQ and New York Stock Exchange stocks finds strong evidence that the turnover ratio, computed by dividing a firm's number of outstanding shares by its annual trading volume, is related to the bid-ask spread. The authors do not consider ownership structure, so they do not examine whether higher turnover is due to a firm's ownership structure or not. It is important to distinguish latent liquidity from trading volume. Therefore, we introduce a new measure of the weighted average investment horizon to determine the level of liquidity for individual stocks.

Effects from investment horizon of institutional investors have mixed results. Yan and Zhang (2007) conclude that short-term institutions are better informed based upon the facts that short-term institution's trading is positively related to future stock return and earnings surprises. On the other hand, Gaspar et al. (2005) and Chen et al. (2007) report that higher holdings by long-term investors are associated with improvement of post-event performance in case of takeover and merger & acquisitions.

With regards to foreign investors, Tesar and Werner (1995) find that the turnover rate on equity held by non-residents is higher than the overall turnover rate on the domestic market. Foreigners respond to changes in economic conditions by making frequent and sizable shifts in their holdings of foreign securities, even though much of this activity has little impact on net investment position. According to Nitta's (2000) analysis of data from 1988 to 1997, a positive correlation exists between the ratio of foreign ownership and management performance measures such as return on equity (ROE), but a negative correlation is observed in the case of the cross-holding ownership ratio and management performance.

In Japan, foreigns and cross-holding shareholders are important constituents in ownership structure. Foreigners typically have a shorter investment horizon and are apt to monitor management, they expect to contribute improvement of liquidity and value, whereas cross-holding shareholders typically have a longer investment horizon and are less active in monitoring management. We expect that the larger the percentage of foreign ownership, the higher the firm value; on the other hand, the larger the percentage of cross-holding owners, the lower the firm value. The Japanese market provides an ideal data set to test the previously proposed hypothesis.

2.2 Hypotheses

We test the following hypotheses with respect to the relation of ownership structure, liquidity and firm value.

H1: The longer the investment horizon, the lower the liquidity. If a firm has many long-term investors, they will trade infrequently such that the liquidity of the stock will remain low.

H2: The higher the ownership concentration, the lower the liquidity. Ownership concentration is to strengthen information asymmetry, which increases transaction costs, reduce liquidity[1]. The proxy of concentration is top30 ownership. We separate the top30 ownership into insider and non-insider portion to investigate the effect of which is greater.

H3: We test whether investor category who owns large amount of shares affects size and direction of impact on liquidity. When high cross-holding ratio is associated with high top30 ratio, we expect an increase in illiquidity, whereas when high foreign ownership ratio is associated with high top30 ratio, we expect decrease in illiquidity. Because foreigners are

[1] A definition of *Insider* is shares held by insiders within top thirty shareholders. That of *Top30* extracts insiders' share ownership from that of top thirty shareholders.

short horizon investors and sensitive to management entrenchment, their large presence reduces negative impact on liquidity caused by concentration itself. Cross-holders are opposite to foreigners with respect to investment horizon and monitoring management.

H4: For firm value, the shorter the horizon, the higher the value due to positive liquidity effect.

H5: Presence of large shareholders creates tradeoff between monitoring and liquidity because there are two countervailing effects, negative effect from asymmetric information and positive effect from monitoring. Which factor has larger effect on corporate value is an empirical question. Considering investor categories who own large proportion of a firm and whose investment horizon is significantly different, we may point out factors strongly related to firm value.

3. The Data

We use four years of data on First and Second Section companies on the TSE, from 2004 to 2007. The sample includes 1,657 to 1,686 stocks for which liquidity and cross-holding data are fully available. As shown in Figure I , the cross-holding structure of Japanese companies changed rapidly during this period. The Program for Financial Revival implemented in 2002 accelerated the unwinding of cross-holding by banks, while the presence of foreign investors rose.

3.1 Investment horizon

A firm's investment horizon is estimated from two sources of the data. First, the investment horizons of an investor group are computed from the aggregated market data provided by the TSE. Each investor group's investment horizon is the total trading volume during the year divided by the average portfolio market value at the start and end of each year. The data source for stock ownership by investor group is the TSE's Share Ownership Survey. The trading amount of each investor group is compiled by the TSE and published annually in its Investment Trends by Investor Group.[2] There are four investor categories used at this stage of the estimation; foreigners, individuals, non-financial corporations, and a group of financial institutions (trust banks, insurance companies, and banks).[3] The following is the equation for an investor group *j*'s investment horizon in year *t*:

$$(1)\quad InvestmentHorizon_t^j = \frac{(portfolio\ market\ value_t^j + portfolio\ market\ value_{t-1}^j) \times \frac{1}{2}}{total\ \text{yen}\ trading\ volume_t^j}$$

(Table 1 around here)

Table 1 shows the average investment horizon for each investor group at the aggregate level. A non-financial corporation's investment horizon (*Horizon*) is 5 to 7 years and an insurance company's *Horizon* is 15 to 21 years, which is the most inactive among six investor categories in Table 1. The *Horizon* of foreigners is 0.2 to 0.4 year, which means they trade two to five

[2] The original monthly data frequency was converted into fiscal years. The ownership survey covers seven local markets in Japan, whereas trading volume covers three major markets. The volume on four local exchanges account for about 0.01% of total trading volume in the entire market.

[3] In the classification of financial institutions, the investor categories in annual reports do not match the three subgroups available in the TSE statistics, such as commercial banks, insurance companies, and trust banks. Therefore, we take an average of the investment horizons for commercial banks, insurance companies, and trust banks as the investment horizon for financial institutions when computing the investment horizons of the TSE-listed companies.

times a year. The *Horizon* of individuals is 0.3 to 0.5 year. The finding that foreigners' *Horizon* is shorter than that of domestic investors is consistent with Tesar and Werner (1995). The authors report turnover rates in domestic equity held by foreign residents for five major countries—including the United States, the United Kingdom, and Japan—and find that foreign investors transact at a significantly higher rate than domestic investors.

Next, we compute *Horizon* for firm k in year t as follow:

$$(2) \quad Horizon_t^k = \sum_{j=1}^{4} w_{k,t}^j \times Horizon_t^j$$

where j represents one of four investor categories, foreigners, individuals, non-financial corporations, and financial institutions; $w_{k,t}^j$ is a firm j's ownership ratio obtained from the company's annual report; and $Horizon_t^k$ is the market-wide investment horizon by investor group. The data source for ownership structure was QUICK's AMSUS. Thus, the investment horizons for all listed firms are estimated based upon companies' ownership structure[4].

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[4] The following example illustrates the computation of equation (2). In 2007 Sony Corporation's ownership ratios $w_{k,t}^j$ of foreigners, individuals, non-financial corporations, and financial institutions were 50.73, 23.11, 3.10, and 21.57%, respectively. Using the $Horizon_t^j$ and $w_{k,t}^j$, we compute the weighted average of Sony's investment horizon, which is about 2.8 years:

$$\begin{aligned} &A\ weighted\ average\ of\ Horizon \\ &= 0.217 \times 50.73\% + 0.373 \times 23.11\% + 6.77 \times 3.1\% + \frac{1}{3} \times (0.959 + 16.659 + 15.650) \times 21.57\% \\ &= 0.11008 + 0.08620 + 0.20987 + 2.39197 = 2.8\ \text{year} \end{aligned}$$

We use the NEEDS database as an additional source of data on large individual shareholders such as the founder (owner) of a firm and, national and local governments on the top 30 shareholders list. We use these data to adjust the above computation. Since neither a founder (owner) nor a government trade like ordinary individual investors, we assign the longest investment horizon among six sub-investor categories in the same year to their ownership category.

3.2 Ownership structure

3.2.1 Ownership concentration by insiders and non-insiders

Our measure of ownership concentration is the sum of the top 30 shareholders' holdings divided by the total number of shares outstanding. In addition, we partition block-holdings into its two major components, insiders' and non-insiders' equity holdings [5]. Higher concentration by insiders may be a signal of weak governance, whereas concentration by non-insider serves as a proxy for the probability that informed investors participate in the market. The concentration by non-insiders strengthens the severity of adverse selection costs.

3.2.2 Investor category ownership ratio

Equity holding by an investor category is computed as the number of shares owned by each investor category divided by the total number of shares outstanding. Foreign and individuals investor are used in a regression analysis.

[5] Rubin (2007) uses insider and institutional block holdings to measure concentration. Hartzell and Starks (2003) use a measure that is the top five non-insider institutional investors' holdings divided by the total number of institutional holdings.

3.2.3 Cross-holding

Our measure of cross-holding shareholders is the Mochiai holding ratio of each stock, estimated by the NLI Research Institute. The Mochiai holding occurs when two listed companies mutually hold shares, confirmed through disclosed materials.[6] An average Mochiai ratio is around 9% and the maximum is above 50%.[7]

3.3 Liquidity

Total trading cost consists of bid-ask spread and market impact cost. Goyenko et.al.(2009) suggests that reliable proxy for spread and market impact are different. We select Amihud (2002)'s illiquidity measure[8] for the proxy of market impact and quoted spread[9] for the proxy of adverse selection cost.

3.3.1 Market impact measure

Amihud measure is the monthly average of the absolute daily return divided by the daily yen volume. We eliminate stocks traded less than 10 days per month. Here, *ILLIQ* shows the relation between price change and volume; it is a rough estimate of spread plus market impact cost. We use the average relative illiquidity (*RILLIQ*) for each fiscal year:

$$(3) \qquad ILLIQ_{iy} = \frac{1}{D_{iy}} \sum_{t=1}^{D_{iy}} \frac{\left| R_{iyd} \right|}{VOL_{ivyd}}$$

[6] Alternative measure is the Antei (=stable) holding, where the ownership of a firm's shares by banks and life insurance companies is disclosed but the firm's holdings of counterparty shares cannot be confirmed by disclosed materials. Our choice of cross-holding measure does not affect the empirical results. Refer to Nitta (2002) for details.
[7] Nitta (2002) shows that the higher the cross-holding ratio, the worse the various managerial indices, such as the ROE.
[8] This measure is one of best measure as a proxy for market impact, according to Goyenko et.al.(2009)
[9] Quoted spread is widely used as a proxy for adverse selection costs such as Atkins and Dyl (1997) and Rubin (2007).

$$(4) \qquad RILLIQ_{iy} = \frac{ILLIQ_{iy}}{\frac{1}{N}\sum_{t=1}^{N_y} ILLIQ_{iy}}$$

Here, *RILLIQ* is adjusted for market-wide liquidity changes and converted into a natural logarithm[10]. According to the literature, liquidity has a commonality (Chordia et al. 2000), and its market-wide fluctuation has differential impacts on the price of individual stocks (Amihud 2002). Thus, *RILLIQ* is adjusted for a time series variation of market-wide liquidity changes.

3.3.2 Bid-ask spread

Quoted spread (*SPRD*) is defined as the difference between lowest ask price and highest bid price divided by the mid-price of the quotes. SPRDs are calculated every time when best ask and/or bid changes, we compute a time-weighted average spreads for stock j on day t, and then average them over a year. We exclude any quotes before the opening price.

$$(5) \qquad SPRD_{j,t} = \frac{(BestAsk_{j,t} - BestBid_{j,t})}{(BestAsk_{j,t} + BestBid_{j,t}) \div 2}.$$

3.4 Firm value

Our proxy for firm value is so-called Tobin's Q defined as follow:

$$(6) \qquad QRATIO_{j,t} = \frac{(\text{aggregate\_ market\_val ue}_{j,t} + \text{interest\_b earing\_deb t}_{j,t})}{(\text{total capital}_{j,t} + \text{interest\_b earing debt}_{j,t}) \div 2}.$$

[10] The impact of a change in market-wide liquidity on ILLIQ for individual stocks is not uniform: It disproportionately affects low-liquidity stocks (see Amihud 2002 and Chordia et al. 2000).

The financial data for calculating this are from World Scope. When we compute Tobin's q, the cross-holding-adjusted aggregate market value is used.[11] Table 2 shows the summary statistics of these variables.

3.5 Cross-sectional correlations

Table 3(A) shows the cross-sectional correlations among the variables. *Horizon* is positively correlated with the logarithm of market capitalization (0.3) and negatively correlated with the share turnover ratio (0.11), as shown in Table 3(A). The correlation with the ownership ratios of *Mochiai* are positive (0.3), meaning that the longer *Horizon*, the higher the *Mochiai* ratio. On the other hand, there is almost no correlation between *Horizon* and *Foreigner* (see Table 3(B)).

(Table 3 around here)

4. Empirical Analyses

4.1 Ownership structure and illiquidity

First, we test the relation between investment horizon and illiquidity. Illiquidity and ownership structure may be simultaneously determined. All variables are most likely endogenous and the estimates based on panel least squares are biased and inconsistent. Considering these problems, we use a two-stage estimation method with instrumental variables to obtain a consistent estimate.[12] Our basic regression equation is

(7) $$Illiquidity_{j,t} = a + bHorizon_{j,t} + cConcentrationVariables_{j,t} + dControlVariable(s)_{j,t} + \gamma_{j,t}$$

[11] Kobayashi (1990) points out that the Mochiai portion should be subtracted from the aggregate market value to calculate Tobin's q.
[12] Woodridge (2002) Chapter 10 -11.

A proxy for market illiquidity is *RILLIQ* and bid ask spread (*SPRD*). For concentration measures, *TOP30, and a set of INSIDER* and *NON-INSIDER*. are used interchangeably. We also test the interaction between *NON-INSIDER* and investor category holdings). The natural logarithm of a firm's market value (*Log_Size*) is added as control variable.[13] Our instrumental variables are the lagged explanatory variables. Heteroskedasticity is corrected by White diagonal standard errors and covariance corrections.

In model1 of Table4, the coefficient of *Horizon* and *Top30* are positive and significant at the 1% level. It means that the longer the investment horizon, the lower the liquidity, and the higher the concentration, the lower the liquidity. These findings are consistent with H1 and H2.

In model2, *TOP30* variable is separated into insider and non-insider portion of concentration, *INSIDER* and *NON-INSIDER* respectively. The result shows that both variables have positive correlation with illiquidity, the coefficient of insider concentration is much larger than that of non-insider concentration (2.248 vs. 0.379). Insider's ownership concentration have a bigger negative impact on liquidity than non-insider's. It indicates when insiders own large portion of the company's shares outstanding, liquidity provided by existing shareholders are limited to cause large market impact.

Model3 examines whether large presence of specific investor category has relation with liquidity under the concentrated ownership. We are interested here in the magnitude and direction of the investor category's influence. We insert cross-term variables such that (*NON-INSIDER* x holding ratio of investor category such as *Foreign, Indiv*, and *Crosshld*) as explanatory variables. The result shows that *Foreign* and *Indiv* are insignificant, but

[13] Amihud (2002) shows a high negative correlation (-0.614) between firm size and RILLIQ. In our case the correlation is -0.57.

Crosshld has a significant positive coefficient with *ILLIQ*. It means that only case where the high non-insider concentration is associated with high cross-holding ratio, illiquidity increases. The result indicates not only how large the concentration but also what types of investors own such large proportion. Cross-holders own shares not for pure investment purpose, does not trade, and provide less commitment to monitoring, so that other market participants see these factor negatively for liquidity. In case of foreigner and individuals, their short horizon investment style mitigate negative effect from asymmetric information on liquidity.

Next we use *SPRD%* to run regression equation (8), where *SPRD%* is the percentage of bid-ask spread in year t for firm j. Since the severity of asymmetric information affects the size of the spread, we expect that the higher the *TOP30*, the wider the spread. We include number of trades per day (*Trade*), relative tick size (*Tic/Price*)[14] as control variables.

In table 5, the coefficient of *TOP30* is positive and significant, however that of *HORIZON* is insignificant. As Goyenko et.al. (2009) suggest that the results support notion that bid-ask spread is directly related to adverse selection cost and ownership concentration is more important than investment horizon. In model2 both of *INSIDER* and *NON-INSIDER* show positive correlation with *SPRD%*, the coefficient of *INSIDER* is larger than that of *NON-INSIDER* (0.4365 vs. 0.2079). It means that higher concentrations by insiders as well as non-insiders increase the bid-ask spread which is contrary to Rubin (2007) which reports negative correlation between insider holdings and bid-ask spread. Our result indicates that insider holdings are related to asymmetric information.

[14] Unlike the New York Stock Exchange, the TSE uses a tick size that is a step function of share price. In the sample period of 2004 and 2007, the tick size is ¥1 for stocks priced below ¥2000, ¥5 for stocks priced between ¥2,001 and ¥3,000, ¥10 for stocks priced between 3,001 and ¥30,000. For further detail, see TSE(2010)

Model3 examines investor categories' effect on liquidity. The coefficients of *Foreign x NON-INSIDER* and *Crosshld x NON-INSIDER* are positive, but that of *Indiv x NON-INSIDER* is negative. Large presence of cross-holders and foreigners increase adverse selection cost, while individuals mitigate it. It shows that foreigners have superior information which increases information asymmetry among investors.

4.2. Ownership, liquidity, and their effects on firm value

We extend an analysis to the relation among investment horizon, ownership concentration and firm value. Tobin's q (*QRATIO*) is used as a proxy for the firm's market valuation. The basic regression equation is

$$QRATIO = a + bHorizonVariable + cConcetrationVariables + dControllVariables + \varepsilon \quad (8)$$

where horizon variable and concentration variables are same as equation (8) and the debt asset ratio (*Debtasset*) and the profit growth rate (*Growth*) are included as control variables. *Debtasset* is calculated as total debt divided by total assets, and *Growth* is calculated as the one-year growth rate of the ordinary profit which is equivalent to income before extraordinary items and taxes. In order to avoid endogeneity problem, we use the two-stage estimation with instrumental variables to obtain a consistent estimate. Our instrumental variables are the lagged explanatory variables. A panel regression analysis is carried out according to the result of the Hausman test which rejects the random effect model for both time and cross section, and then the fixed time-effect model is selected.[15]

[15] The Hausman test rejects the random effect model at p = 0.0099 with equation (6) and at p = 0.0012 with equation (7).

The estimated results are shown in Table 6. *HORIZON* is negatively correlated with the firm value. It means that longer investment horizon of shareholders has negative impact on firm value. This is interpreted as illiquidity effect. *TOP30* is positively correlated with the firm value. The result supports the notion that block-holders influence corporate governance and improve performance. On the issue of trade-off between monitoring and liquidity (H5), this result indicates that positive impact of monitoring activity is larger than negative impact of illiquidity caused by concentration[16]. This is a unique and important finding of this study in the relation of corporate governance and market microstructure.

In model2 *INSIDER* and *NON-INSIDER* are significant. The coefficient of *NON-INSIDER is slightly larger than that of INSIDER* (0.0122 vs. 0.0100, respectively). We expect pressure from non-insider block holder is larger than that from insiders, but the difference is not as large as expected.

Model3 examine whether specific investor category influences to firm value. The variable of (*NON-INSIDER* x investor category such as *Foreign, Indiv*, and *Crosshld*) shows differential effects on firm value. As we expect, *Foreign* has a significantly positive relation with Q-ratio, but *Crosshld* has a significantly negative relation. The results support Leleux, Vermaelen, and Banerjee (1995) that analyze the impact of large block-holders on firm performance in France and find that the identity of the block-holders is crucial.

These findings indicate that ownership structure and its composition affect firm's valuation. If there is high crossholding relationship, market participants judge the firm to be lax in

[16] As a related study, Gaspar and Massa (2007) examine the trade-off between ownership, liquidity and firm value. They find that the effect of ownership on Tobin's Q is not statistically significant after controlling the endogeneity of ownership by IV estimate.

corporate governance and discount the firm's value. Ignorance of corporate governance severely deteriorates firm's valuation as well as liquidity.

(Table 6 around here)

4.3 Robustness check,

As a robustness check, we investigate how changes in *HORIZON* and *TOP30* affect liquidity measures. We will see the lagged relationship between them. When a company's weighted average of investment horizon or concentration of ownership changes, existing and new shareholders must buy or sell shares in the market. It affects our measures of liquidity and firm value on the same year due to large movement of position made by institutions and foreign investors. For our purpose to confirm robustness of the relation among ownership, liquidity and firm value, we should ask the following question. When a firm's ownership concentration declines, what happens to liquidity and firm value on the following year? Thus the equation (9) is estimated with three different dependent variables.

(9)

$$\Delta Variables(Illiquidity, Value)_{j,t} = a + b_1 \Delta HORIZON_{j,t-1} + b_2 \Delta TOP30_{j,t-1} + b_3 \Delta ControllVariables_{j,t} + \gamma_{j,t}$$

Dependent variables $\Delta Variables$ a change of ILLIQ, SPRD, and QRATIO. In equation (9) where $\Delta ILLIQ$ is the change in *ILLIQ* for stock j from year t-1 to year t. $\Delta SPRD\%$ is the change in percent bid-ask spread of stock j from year t-1 to year t. $\Delta QRATIO$ is the change in QRATIO of stock j from year t-1 to year t. In addition to $\Delta HORIZON$ and $\Delta TOP30$, we

include *⊿Market_ILLIQ for ⊿ILLIQ, ⊿Tic÷⊿Price*[17] for*⊿SPRD%,* and *⊿Debtasset and ⊿Growth* to as control variables,

The results are presented in Table 7. With respect to *⊿ILLIQ* , larger *⊿HORIZON causes* greater deterioration on liquidity. Increasing insider ownership is positively correlated with illiquidity on the next year, increasing non-insider ownership has the opposite effect on illiquidity.

With respect to *⊿SPRD%, ⊿HORIZON* has negative coefficient. It means that increased short-term shareholders increases adverse selection risk for other market participants. When insider and non-insider concentration increases, the bid-ask spread widens as well.

With respect to *⊿QRATIO, ⊿Insider* and *⊿Non-Insider* at t-1 have positive impact on firm value. This supports the notion that higher concentration improves governance and firm value. Maug (1998), for instance, suggests that the characteristics of the large shareholders, such as institutions, and their organizational structure are potentially important aspects for the success of monitoring activities.*⊿HORIZON* have negative but insignificant relation with *⊿QRATIO* .

In summary, investment horizon and ownership concentration are important factors that influence both liquidity and value of firm's share. When they change, there are associated changes in liquidity and firm value.

(Table 7 around here)

[17] This is an adjustment of the effects of the TSE's step-wise tick table.

5. Conclusions

We empirically show that the weighted average investment horizon of a firm's ownership structure affects its liquidity. In addition, investment horizon and monitoring management influence a firm's value.

Our empirical results are summarized in the following four points.

(i) The latent investment horizon relates to a firm's market liquidity. The latent investment horizon is computed from the ownership structure and the average investment horizon of the investor categories. The longer the latent investment horizon, the lower the liquidity.

(ii) Concentrated ownership has negative impact on liquidity. The investor categories considered in this study are insider, non-insiders, foreign, cross-holding and individuals When insiders own large proportion of the shares, negative effect is larger compared to the case where non-insiders own large proportion of the shares. Effects from concentrated ownership depend upon who owns them. Under the concentrated ownership, the higher the cross-holding, the lower liquidity. The greater foreign ownership widens *SPRD%* but not *ILLIQ*. This indicates asymmetric information effects is more important for bid-ask spread measures.

(iii) The investment horizon influence firm value. A shorter investment horizon has a positive impact on firm value.

(iv) Ownership structure affects firm value by signaling a firm's corporate governance status. The higher the cross-holding, the lower the firm value. Monitoring by foreign investors, however, contribute improvement of market liquidity as well as the firm's valuation directly.

The results support the notion that the composition and investment horizon of ownership structure influence market liquidity and firm value. It indicates that a weighted average investment horizon of the firm's shareholders is an important characteristics of firm's ownership structure with respect to liquidity and value.

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Figure 1. Ownership ratio trends by investor category.

This figure shows the trend in the ownership structures of Japanese companies for the period 2002 to 2007. The foreigner ownership ratio is that at the end of the fiscal year as reported by QUICK-AMSUS. The *antei* (stabilizing holding) and mochiai ratios of each stock are estimated by the NLI Research Institute. A mochiai holding occurs when two listed companies mutually hold shares, confirmed through disclosed materials. An antei holding refers to cases where the ownership of a firm's shares by banks and life insurance companies is disclosed but the firm's holdings of the counterparty shares cannot be confirmed by disclosed materials. The mochiai figures are included in the antei holding ratio. The sample includes stocks in the First and Second Sections of the TSE.

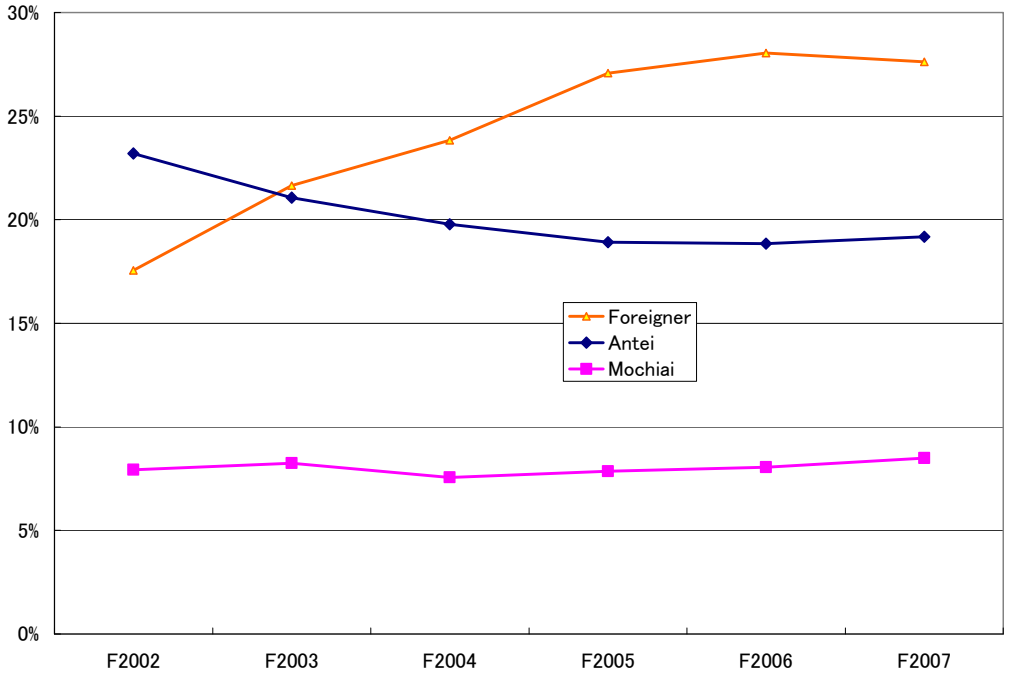

Table 1. Average investment horizon by investor category.

The investment horizon by investor category is computed from the annual turnover ratio, that is, the average of the aggregated market value of an investor category's ownership at the start and end of each year divided by the total trading amount of the investor category during the year.

Fiscal Year	Foreigner	Individuals	Non-financial Corporates	Trust Banks	Insurance	Banks
2004	0.414	0.531	7.488	1.238	15.451	11.515
2005	0.331	0.304	5.711	1.065	18.845	13.143
2006	0.303	0.393	6.615	1.206	21.274	17.568
2007	0.219	0.373	6.773	0.959	16.659	15.650

Unit: year.

Source: TSE's Share Ownership Survey,. and the Investment Trends by Investor Category.

Table 2. Summary statistics.

This table shows the summary statistics of the explanatory variables. Here, *HORIZON* is a weighted average of the investment horizons of sample firms, *TOP30* is the sum of the top 30 shareholders' holdings divided by the total number of shares outstanding, *QRATIO* is Tobin's q = (aggregate market value + interest-bearing debt)/(total capital + interest-bearing debt), where the aggregate market value is adjusted for the cross-holding proportion of ownership. Crosshld, Foreign, Indiv are the percentages of ownership of firm j's investor categories (cross-holding, foreigner and individuals) at the end of fiscal year t

	FY	Mean	Median	Maximum	Minimum	Std Dev.	#Obs.
HORIZON	ALL	4.81	4.89	10.12	0.28	1.34	6,695
(Year)	2004	4.72	4.82	8.00	0.28	1.24	1,672
	2005	5.29	5.40	10.12	0.43	1.45	1,680
	2006	5.29	5.40	10.10	0.43	1.45	1,680
	2007	4.66	4.83	8.63	0.31	1.30	1,686
TOP30	ALL	50.84	50.60	91.38	0.73	15.74	6,604
(%)	2004	51.16	51.11	91.20	4.96	15.64	1,633
	2005	51.40	51.08	91.38	3.89	15.71	1,649
	2006	50.46	50.10	90.19	2.59	15.66	1,658
	2007	50.36	50.05	88.51	0.73	15.92	1,664
QRATIO	ALL	1.25	1.05	18.91	-9.33	0.88	6,685
	2004	1.22	1.05	12.89	0.22	0.77	1,657
	2005	1.48	1.22	18.91	-9.33	1.14	1,667
	2006	1.29	1.10	11.90	-7.50	0.87	1,676
	2007	1.01	0.89	9.26	0.24	0.59	1,685
Crosshld	ALL	9.22	7.34	55.22	0.00	8.55	6,695
(%)	2004	9.14	7.40	49.64	0.00	8.32	1,657
	2005	9.12	7.35	53.02	0.00	8.42	1,672
	2006	9.25	7.32	55.22	0.00	8.63	1,680
	2007	9.36	7.30	53.11	0.00	8.83	1,686
Foreign	ALL	12.80	9.48	78.27	0.00	11.91	6,695
(%)	2004	12.63	9.17	73.65	0.05	11.81	1,657
	2005	12.55	9.22	77.63	0.05	11.68	1,672
	2006	13.18	9.97	77.45	0.00	12.07	1,680
	2007	12.84	9.42	78.27	0.00	12.07	1,686
Indiv	ALL	32.10	29.46	95.98	1.81	17.06	6,695
(%)	2004	32.90	30.57	93.51	2.90	16.76	1,657
	2005	31.48	28.58	95.40	2.02	16.74	1,672
	2006	31.71	29.17	95.98	1.81	17.08	1,680
	2007	32.32	29.57	95.37	2.85	17.60	1,686

Note: Some of the minimum values of Tobin's q (QRati*o*) are negative due to the negative equity capital of the distressed firm.

Table 3 Correlations.

Panel A. Correlation between horizon, size, and turnover.

This table shows the correlation between *HORIZON, TOP30, Log market value*, and *Turnover*. Here, *HORIZON* is a weighted average of the investment horizons of each firm (equation(2)), and *TOP30* is the sum of the top 30 shareholders' holdings divided by the total number of shares outstanding and *Market value* is the number of shares outstanding multiplied by the stock price at the end of the fiscal year. *Turnover* is calculated as the daily trading volume divided by the number of shares outstanding. The correlation coefficients are estimated annually and averaged over the years 2004 to 2007.

	HORIZON	*TOP30*	*Log Size*	*Turnover*
HORIZON	1	0.4631	0.2917	-0.1108
TOP30	0.4631	1	0.0130	-0.1347
Log Size	0.2917	0.0130	1	0.0350
Turnover	-0.1108	-0.1347	0.0350	1.0000

Panel B. Correlation between *HORIZON* and investor category's holding ratios.

This table shows the correlation between the *HORIZON* and the holding ratios of investor categories such as foreign, cross-holding, and individual investors. The correlation coefficients are estimated annually and averaged over the years 2004 to 2007.

	HORIZON	*Foreign*	*Crosshld*	*Indiv*
HORIZON	1	-0.0298	0.3493	-0.7557
Foreign	-0.0298	1	-0.1221	-0.4885
Crosshld	0.3493	-0.1221	1	-0.1224
Indiv	-0.7557	-0.4885	-0.1224	1

Table 4　Panel least squares analysis of illiquidity.

This table shows the relation of illiquidity with investment horizon and the ownership concentration ratio for stocks in the First and Second Sections of the TSE over the period 2004 to 2007. The results are from the panel least square regressions. The fixed period effect model is selected as a result of the Hausman test. In order to avoid endogeneity problem, we use the two-stage estimation with instrumental variables to obtain a consistent estimate. Our instrumental variables are the lagged explanatory variables. $RILLIQ_{j,t}$ is the relative ILLIQ for firm j defined by equation (3), $log\_Size_{j,t}$, is the natural logarithm of firm j's market value at the end of March, $HORIZON_{j,t}$ is the weighted average of the holding period for firm j's stockholders in year t, *TOP30* is the sum of the top 30 shareholders' holdings divided by the total number of shares outstanding and $Crosshld_{j,t}$ and $Foreign_{j,t}$ are the percentages of ownership of firm j's investor categories at the end of fiscal year t. $a, b, c, d, and\ e$ are parameters to be estimated and γ is an error term. Heteroskedasticity is corrected by White diagonal standard errors and covariance corrections.

Dependent Variable: RILLIQ						
	Model1		Model2		Model3	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
HORIZON	0.1724	15.94	0.2751	17.60	0.2656	13.60
TOP30	0.7418	8.22				
INSIDER			2.2483	12.97	0.0212	11.92
NON-INSIDER			0.3785	4.03		
*NON=INSIDER*Foreign*					-0.0046	-1.52
*NON-INSIDER*Indiv*					0.0051	1.42
*NON=INSIDER*CrossHld*					0.0159	5.38
Log Size	-1.0736	-146.30	-1.0697	-143.50	-1.0416	-87.60
Intercept	2.0914	24.21	1.6658	16.87	1.6756	10.40
Adjusted R-squared	0.817		0.823		0.823	
Observations	4,899		4,899		4,899	

Table 5 Panel least squares analysis of Bid-Ask Spread

This table shows the relation of bid-ask spread with investment horizon and the ownership concentration ratio for stocks in the First and Second Sections of the TSE over the period 2004 to 2007. The results are from the panel least square regressions. The fixed period effect model is selected as a result of the Hausman test. In order to avoid endogeneity problem, we use the two-stage estimation with instrumental variables to obtain a consistent estimate. Our instrumental variables are the lagged explanatory variables. $SPRD\%_{j,t}$ is time-weighted quoted bid-ask spread divided by midprice, $\log\_Size_{j,t}$, is the natural logarithm of firm j's market value at the end of March, $HORIZON_{j,t}$ is the weighted average of the holding period for firm j's stockholders in year t, *TOP30* is the sum of the top 30 shareholders' holdings divided by the total number of shares outstanding, and $Crosshld_{j,t}$, $Foreign_{j,t}$ and $Indiv_{j,t}$ are the percentages of ownership of firm j's investor categories at the end of fiscal year t. $a, b, c, d, and\ e$ are parameters to be estimated and γ is an error term. Heteroskedasticity is corrected by White diagonal standard errors and covariance corrections.

Dependent Variable: SPRD%						
	Model1		Model2		Model3	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
HORIZON	-0.0073	-1.17	0.0058	0.58	0.0045	0.39
TOP30	0.2463	6.00				
INSIDER			0.4365	3.99	0.5741	4.65
NON-INSIDER			0.2079	4.68		
*NON=INSIDER*Foreign*					0.0129	8.44
*NON-INSIDER*Indiv*					-0.0087	-4.99
*NON=INSIDER*CrossHld*					0.0048	2.59
Log Trade	-0.3588	-38.25	-0.3573	-39.79	-0.4031	-33.96
TIC/VWAP	1.0237	27.99	1.0376	26.02	1.0870	23.52
Intercept	4.0277	42.77	3.9523	45.89	4.5395	35.86
Adjusted R-squared	0.656		0.657		0.666	
Observations	4,899		4,899		4,899	

Table 6 Panel least squares analyses of Tobin's q.

This table shows the relation between firm value and investment horizon, ownership concentration, and ownership ratios for foreigners, individuals, and cross-holding for First- and Second-Section stocks of the TSE over the period 2004 to 2007. To avoid any endogeneity problems, we employ lagged variables as instrumental variables. The fixed period effect model is selected as a result of the Hausman test. In order to avoid endogeneity problem, we use the two-stage estimation with instrumental variables to obtain a consistent estimate. Our instrumental variables are the lagged explanatory variables. Here, *QRATIO* is Tobin's q = (aggregate market value + interest-bearing debt)/(total capital + interest-bearing debt), where the aggregate market value is adjusted for the cross-holding proportion of ownership. *Foreign, Indiv* and *Crosshld* are the same as in equation (7). *Debtasset* is calculated as total debt divided by total assets, and *Growth* is calculated as the one-year growth rate of the ordinary profit which is equivalent to income before extraordinary items and taxes. Heteroskedasticity is corrected by White diagonal standard errors and covariance corrections.

Dependent Variable: QRATIO								
	Model1		Model2		Model3		Model4	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
HORIZON	-0.2004	-7.09	-0.2130	-5.09	-0.0544	-1.53	-0.0839	-2.20
TOP30	0.0118	6.51						
INSIDER			0.0100	2.69	0.0080	2.20	0.0068	1.73
NON-INSIDER			0.0122	5.73				
*NON=INSIDER*Foreign*					0.0002	3.03	0.0001	2.56
*NON-INSIDER*Indiv*					0.0001	1.43		
*NON=INSIDER*CrossHld*					-0.0003	-6.39	-0.0003	-6.27
Debt/Asset	-0.0044	-2.74	-0.0044	-2.73	-0.0027	-1.81	-0.0024	-1.72
Growth	-1.2369	-2.28	-1.2390	-2.28	-1.1628	-2.26	-1.1564	-2.26
Log_Size	0.1990	12.83	0.1986	12.96	0.1397	5.19	0.1186	5.97
Intercept	1.0916	5.56	1.1441	4.58	0.9661	3.17	1.4066	5.32
F stats	134.6		118.2		100.5		111.5	
Prob(F-statistic)	0.000		0.000		0.000		0.000	
Observations	4,892		4,892		4,892		4,892	

Table 7 The effects of changes in liquidity measures

This table shows the effects of changes in *HORIZON* and *Top30* at a prior year to liquidity as well as firm value. The results are from the panel least squares. In model1 where *⊿ILLIQ* is the change in *ILLIQ* for stock j from year t-1 to year t. In model2 *⊿SPRD%* is the change in percent bid-ask spread of stock j from year t-1 to year t. Changes in *HORIZON*, *INSIDER* and *NON-INSIDER* at the previous year are included as explanatory variables. In model1, we include the change in the market-average ILLIQ (*Market_ILLIQ*). In model2, we have *⊿Tic* and *⊿Price* to adjust the effects from the TSE's step-wise tick schedule. Definitions of *Debt/Asset* and *Growth* are same as table 6. Heteroskedasticity is corrected by White diagonal standard errors and covariance corrections.

	Model1		Model2		Model3	
Dependent Variable:	⊿ILLIQ		⊿SPRD%		⊿QRATIO	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
⊿HORIZON(-1)	-0.0570	-4.41	-0.0371	-3.59	-0.0038	-1.70
⊿INSIDER(-1)	0.0099	2.88	0.0067	3.13	0.0409	3.99
⊿NON-=INSIDER(-1)	-0.0083	-2.32	0.0038	2.70	0.0017	4.97
⊿(Tic/Price)			0.9944	111.35	0.0061	0.93
⊿Trade			-0.1251	-5.09		
⊿Debt/Asset					-0.0001	-6.58
⊿Growth					-0.2346	-21.59
⊿Market_ILLIQ	-32.6696	-8.18				
Intercept	30.7375	8.22	0.2365	9.96	-0.2346	-21.59
Adjusted R-squared	0.046		0.329		0.126	
Observations	3,181		3,181		3,181	