JSPS Grants-in-Aid for Creative Scientific Research
Understanding Inflation Dynamics of the Japanese Economy
Working Paper Series No.20

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—An Empirical Investigation Using Market Survey Data

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March 17, 2008

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Abstract

This article empirically examines "disagreement" models using JASDAQ market data by exploiting institutional investors' forecasts of future stock prices. We use the standard deviations of the one-month ahead forecasts of stock prices in the QSS Equity Survey as the measure of disagreement in the market. The results indicate that an increase in disagreement is associated with an increase in contemporaneous stock returns and lower average expected returns. In terms of the latter, while the survey data provides an average assessment of market-wide expectations, when disagreement is high the current market price tends to reflect the opinions of more optimistic market participants. These results contrast with comparable findings using TOPIX data (representing larger firms on the Tokyo Stock Exchange's first section) that contradict the predictions of disagreement models. One reason posited is that firms on the JASDAQ market are much smaller and the number of market participants more limited. Accordingly, institutional "limits of arbitrage", such as short-sale and liquidity constraints, are more binding and their influence on stock prices is thereby greater.

JEL classification: G10; G14
Keywords: Stock Prices; Disagreement; Survey Data; JASDAQ

*I gratefully acknowledge QUICK Corp. for providing me with QSS Equity Survey data. Comments from the participants of Hitotsubashi macro lunch and financial assistance from the Japan Society for Promotion of Science (#18330067) are greatly acknowledged.

1 Introduction

This paper uses Japanese data to test the empirical implications of recent developments in behavioral finance, which we refer to as "disagreement" models. These models, starting with seminal contributions by Miller (1977), and Harrison and Kreps (1978), and surveyed in Hong and Stein (2007), display two key elements. First, they assume some disagreement or difference in opinion among investors over the valuation of assets. Second, some institutional factors, typically short-sales constraints, prevent the arbitrage mechanism from working completely. As a result, the market price tends to reflect the expectations of optimistic investors. Accordingly, the informational role of asset prices is partially confined and the market price can be persistently higher than the fundamentals.

Empirically, the "limits of arbitrage" argument is more relevant for markets with lower liquidity, less information disclosure, and more uncertainty about valuation. Hence it is natural that the NASDAQ market during the IT bubble has been frequently cited as a typical example. The JASDAQ market is, as the name implies, the Japanese stock market for small and entrepreneurial firms created as a counterpart to the NASDAQ. However, it is arguably a less mature market than the NASDAQ and experienced a more primitive mini-IT bubble during the period 2003–2005. Utilizing a survey of institutional investors' forecasts, we demonstrate that "disagreement" models explain price movements in the JASDAQ market well.

While this paper examines the general implications of recent "disagreement" models, the main arguments will be more transparent if a particular theoretical model is put forward for discussion. We draw on the model in Chen, Hong, and Stein (2002) as a starting point. Chen, Hong, and Stein (2002) assume two groups of investors exist in the market, with one being more optimistic than the other. When there is no short-sale constraint, the arbitrage-free price will be the average of the valuations of these two investor groups. However, if the constraint is binding, the more pessimistic group cannot short-sell the stock so that only the opinion of the optimistic fraction of the market will be reflected in the market price. Thus, the model predicts that the current stock price will be higher if: (i) disagreement among investors is high, and (2) short-sales or, more generally, liquidity constraints, are binding. In this paper, we examine these features as they apply to the JASDAQ market.

2 Analytical Framework and Data

Recent models of "disagreement" among investors have strong ties with the literature on information asymmetry and trading volume. The empirical correlation between stock returns and trading volume is often interpreted as a consequence of differences in opinion among investors (Baker and Stein 2004; Brennan, Chordia, and Subrahmanyam 1998; Datar, Naik, and Radcliffe, 1998).

However, some previous studies in the US market have employed survey information to measure the extent of disagreement. Diether, Malloy, and Scherbina (2002), for example, used analysts' forecasts of individual firms' earnings per share and examined the effect on the cross-section of stock returns. Gilchrist, Himmelberg, and Huberman (2005) used the same data and found that this measure of disagreement affected firms' Tobin's q, real investment decisions, and new equity issues.

In this paper, we use the QSS Equity Survey conducted by QUICK Corp. to measure the disagreement among investors[1]. In this survey, institutional investors are requested at the beginning of every month to provide their forecasts of Japanese stock price indexes, namely the Nikkei 225, TOPIX, and Nikkei JASDAQ Average. Several days later, descriptive statistics, including the means and standard deviations of the survey responses, are revealed to the subscribers of QUICK Corp. The forecasts of the Nikkei JASDAQ Average, which is the main focus of our empirical analyses, along with the TOPIX, have been gathered since June 2000, while the Nikkei 225 forecast data has a much longer history. Problematically, there are some months at the beginning of the sample where the number of responses are much smaller than the average and the data is not reliable. Thus, we dropped the first six months from the sample. The final sample starts in January 2001 and ends in February 2005, comprising 50 monthly observations. Although there is some variation in the number of responses, from 2001 onwards these are relatively stable at about 140 individual responses per month.

Next, we modify the basic elements of recent "disagreement" models and draw empirical implications that can be tested with the QSS Equity Survey data.

[1] QUICK Corp. is a Japanese financial information vendor and major electronic media company in the Nikkei Group. It provides a variety of economic and financial information to customers in securities and financial markets as well as academic researchers. QUICK's services includes Japanese, Asian, and global real-time financial information, along with news and historical information.

Let us denote the current stock price by P_t and the price level corresponding to the fundamentals by F_t. Investor j's forecast of stock prices in $t+1$ at time t is denoted by $\mathrm{E}_{t,j}[P_{t+1}]$. Its average and standard deviation are denoted by $\mu_t(P_{t+1})$ and $\sigma_t(P_{t+1})$.

The main prediction of "disagreement" models is that when disagreement $\sigma_t(P_{t+1})$ is large, the market price will be higher than the fundamentals so that $P_t > F_t$. However, assessing a reasonable fundamental price F_t is empirically extremely difficult. Hence, all existing studies interpret the implications of the model in terms of asset returns. Here, we draw several empirical implications from a theoretical "disagreement"model, one for contemporaneous stock price change and another for expected future stock price change, as based on survey information.

2.1 Hypothesis 1: Disagreement and Contemporaneous Price Change

The first implication is very straightforward. If disagreement among investors is causing the current market price to be larger than the fundamentals, $P_t > F_t$, then on average, the contemporaneous return from $t-1$ to t will be higher when the observed measure of disagreement among investors over the $t+1$ stock price $\sigma_t(P_{t+1})$ is higher. We estimate the following regression to test our first hypothesis:

$$\Delta p_t = \alpha + \beta \ln(\sigma_t(P_{t+1})), \tag{1}$$

where $p_t = \ln(P_t)$ and $\Delta p_t = p_t - p_{t-1}$. If $\beta > 0$ and is statistically significant in equation 1, we confirm one of the empirical implications of disagreement models.

2.2 Hypothesis 2: Disagreement and Expected Stock Price Change

Disagreement models imply that when $\sigma_t(P_{t+1})$ is high, the current market price P_t reflects only the expectations of optimistic investors. In that case, P_t must be higher than the average valuation of all potential investors in the market. To discuss this situation more thoroughly, let us return to the model of Chen, Hong, and Stein (2002) descibed in the previous section and assume that we have a equal numbers of optimistic and pessimistic investors. The optimists' expectations about the future stock price is denoted by $\mathrm{E}_t^O[P_{t+1}]$ and the pessimists' expectations are denoted by $\mathrm{E}_t^P[P_{t+1}]$. The average expectation of all potential investors in the market is then:

$$\mathrm{E}_t^F[P_{t+1}] \equiv \frac{\mathrm{E}_t^O[P_{t+1}] + \mathrm{E}_t^P[P_{t+1}]}{2}. \qquad \mathrm{E}_t^O[P_{t+1}] > \mathrm{E}_t^P[P_{t+1}].$$

If there is no short-sales constraint and the no arbitrage condition holds, all investors' expectations will be fully reflected in the current stock price. As a result, the current market price P_t embodies $\mathrm{E}_t^F[P_{t+1}]$ and will be equal to the fundamentals F_t by construction:

$$P_t = F_t = f\left(\mathrm{E}_t^F[P_{t+1}]\right).$$

Alternatively, in an extreme case where only the optimists' expectations are reflected in the market price, P_t will be definitely higher than F_t.

$$P_t = P_t^O \equiv f\left(\mathrm{E}_t^O[P_{t+1}]\right) > F_t$$

For simplicity, let us assume current disagreement among investors will disappear by the next period. Then, the following relationship will hold for the ex post price change.

$$P_{t+1} - F_t > P_{t+1} - P_t^O \tag{2}$$

However, as discussed above, it is impossible to obtain fair estimates of F_t and P_t^O in empirical work. Therefore, we take the unconditional expectation of both sides of equation (2) and work with the ex ante relationship to draw a testable implication:

$$\widetilde{\mathrm{E}}_t[P_{t+1} - F_t] > \widetilde{\mathrm{E}}_t\left[P_{t+1} - P_t^O\right]. \tag{3}$$

We can rewrite both sides of the equation as follows.

$$\widetilde{\mathrm{E}}_t[P_{t+1} - F_t] = \widetilde{\mathrm{E}}_t[P_{t+1}] - F_t \tag{3'}$$

$$\widetilde{\mathrm{E}}_t\left[P_{t+1} - P_t^O\right] = \widetilde{\mathrm{E}}_t[P_{t+1}] - P_t^O \tag{3''}$$

The unconditional expectation operator is marked with a tilde to emphasize the fact that it corresponds to the average of all potential investors, not only the optimistic portion of the market.

Market participants cannot infer $\widetilde{\mathrm{E}}_t[P_{t+1}]$ precisely from the current market price, because P_t may not reflect the expectations of some portion of potential investors when a short-sales constraint is binding. As discussed in detail below, the results of the QSS Survey of Equity Prices is released to subscribers several days after the survey has been collected. Consequently, if the timing of the observation of P_t is chosen appropriately, we can assume that investors cannot observe $\mu_t(P_{t+1})$ and $\sigma_t(P_{t+1})$ contemporaneously, so that we can consider the average survey price expectation $\mu_t(P_{t+1})$ as $\widetilde{\mathrm{E}}_t[P_{t+1}]$ in equation (3') and (3").

As already discussed, the theoretical models imply that current market P_t will be lowest and equal to the fundamentals F_t when there is no disagreement among investors, $\sigma_t(P_{t+1}) = 0$. In another extreme case, when only the expectations of the optimistic portion of the market are reflected, $P_t = P_t^O$. Thus P_t will be an increasing function of $\sigma_t(P_{t+1})$.

Let us now define the average expected price change based on the survey result by:

$$\widetilde{\mathrm{E}}_t[\Delta p_{t+1}] \equiv \ln(\mu_t(P_{t+1})) - p_t.$$

Then, from equation (3') and (3"), all other things being equal, $\widetilde{\mathrm{E}}_t[\Delta p_{t+1}]$ will be lower when $\sigma_t(P_{t+1})$ is higher. We can examine this implication of the theoretical model's Hypothesis 2 by estimating the following regression.

$$\widetilde{\mathrm{E}}_t[\Delta p_{t+1}] = \alpha + \beta \ln(\sigma_t(P_{t+1})) \tag{4}$$

Contrary to Hypothesis 1, β will be negative if the disagreement model provides a good description of reality.

2.3 Hypothesis 3: Combining Hypothesis 1 and Hypothesis 2

Finally, we can combine the two hypotheses discussed and examine Hypothesis 3.

$$\widetilde{\mathrm{E}}_t[\Delta p_{t+1}] = \alpha + \gamma \Delta p_t + \beta \ln(\sigma_t(P_{t+1})) \tag{5}$$

If Hypothesis 1 for the contemporaneous price change is true, we can replace $\sigma_t(P_{t+1})$ in equation (4) for Hypothesis 4 with Δp_t. Then, if Δp_t is the only explanatory variable in equation (5), the estimated coefficient γ must be negative. However, a high Δp_t will be correlated with a lower $\widetilde{\mathrm{E}}_t[\Delta p_{t+1}]$ only when the current price increases because of an increase in disagreement among investors. Hence, when both Δp_t and $\sigma_t(P_{t+1})$ are included in equation (5), γ loses its explanatory power and only β will be statistically significant with a negative sign.

2.4 Construction of the Price Data

As discussed, we need to determine the sampling of the stock price P_t by paying particular attention to the timing of the release of the survey results. As shown in Figure 1, the QSS Stock Price Survey collects the one-month ahead price expectation for three days—Tuesday, Wednesday, Thursday—including the first Thursday of the month. On the following Monday, the sample statistics $\mu_t(P_{t+1})$ and $\sigma_t(P_{t+1})$ are released to QUICK's subscribers. P_t in the following analysis is the Thursday closing price corresponding to the very last observation when the survey is conducted. Hence, investors cannot observe either $\mu_t(P_{t+1})$ or $\sigma_t(P_{t+1})$ directly at the time the stock is traded at P_t.

[Insert Figure 1 here]

3 Empirical Analysis

3.1 Graphical Observations

First, we investigate the relevance of the "disagreement model" graphically. In Figure 2, the TOPIX and Nikkei JASDAQ Average indexes (left-hand scale) are shown with the corresponding disagreement measures or standard deviations of one-month ahead forecasts (right-hand scale) for the period January 2001 to February 2005. Apparently, the correlation between Nikkei JASDAQ Average and its disagreement measure are stronger than the correlation between the TOPIX and its measure. One argument is that "disagreement" models are more relevant for financial markets where short-sale and liquidity constraints are binding. Clearly, it is then more applicable to the Nikkei JASDAQ Average than the TOPIX, so Figure 2 is consistent with the theoretical predictions.

In previous studies, the correlation between trading volume and asset prices is also often related to disagreement among investors. In Figure 3, we plot the Nikkei JASDAQ Average (left-hand scale; the same as in Figure 2) and its trading volume (right-hand scale) together. While trading volume tracks the increase in the JASDAQ from the second half of 2004 towards the end of the sample period, the short-term correlation is higher between the JASDAQ and its disagreement measure.

[Insert Figure 2 and Figure 3 here.]

3.2 Econometric Analysis

Following examination of the data plots, we mainly focus on the Nikkei JASDAQ Average in testing Hypotheses 1, 2, and 3. The empirical results for the TOPIX will be discussed briefly as a benchmark for comparison. As one measure of disagreement among investors, we use the natural log of $\sigma_t(P_{t+1})$, which is denoted by $DI_t(p_{t+1})$. For the second measure, we first normalize $\sigma_t(P_{t+1})$ by dividing it by $\mu_t(P_{t+1})$ and then taking its log. The second measure is denoted by $NI_t(p_{t+1})$. Summary statistics for asset returns, expected returns, and the two measures of disagreement are reported in Table 1.

[Insert Table 1 here.]

When the market becomes volatile due to an exogenous shock, the dispersion of investors' expectations about the future price level will be naturally larger. To control for this exogenous shock to $\sigma_t(P_{t+1})$, we include the contemporaneous volatility of stock returns as an explanatory variable. In particular, the variable cv_t is defined by the standard deviation of daily returns for seven trading days up to one day before the day P_t is observed and used as a measure of contemporaneous volatility.

3.3 Disagreement and Contemporaneous Price Change

First, equation (1) is estimated to test whether Hypothesis 1 about the contemporaneous price change Δp_t holds. The estimation results using $DI_t(p_{t+1})$ are provided in Panel A of Table 2 and the results using $NI_t(p_{t+1})$ as a measure of disagreement are reported in Panel B. Comparing the results for the simplest formulation reported in column (1) of both panels, the effect of $DI_t(p_{t+1})$ on Δp_t is stronger than $NI_t(p_{t+1})$. However, the standard deviation of the expected price level is positively correlated with the average level of the expected price. Since the forecasted price tends to be higher when the current price level is higher, Δp_t may also be correlated with $DI_t(p_{t+1})$. On the other hand, $NI_t(p_{t+1})$ is the dispersion of opinions measured in the percentage of the average expected stock price. Consequently, while the estimation results in Panel B with $NI_t(p_{t+1})$ are reasonable, they provide more robust evidence in support of Hypothesis 1.

[Insert Table 2 here.]

In the specification including contemporaneous volatility cv_t in column (2), $NI_t\,(p_{t+1})$ is statistically significant at the 10% level. The coefficients of cv_t are negative in both Panel A and Panel B, which is consistent with existing empirical results reported in the literature on ARCH models.

Given the empirical results reported in the first two columns, we first regress DI_t and NI_t on cv_t, to obtain the residual series ADI_t, ANI_t. We then use these as explanatory variables in place of DI_t and NI_t as measures of disagreement in equation (1). The estimation results using ADI_t, ANI_t are reported in the third, fourth, and fifth columns of Table 2. Note that column (2) and column (4) are intrinsically the same specification. In column 3 in Panel B, ANI_t alone is statistically significant at the 10% level. In column (5), we include lagged explanatory variables, but these are insignificant in both panels. In all specifications, ADI_t is significant at the 1% level and ANI_t is significant at the 10% level, both affecting Δp_t positively. Hence, it can be safely said that disagreement among investors will increase current stock returns.

3.4 Disagreement and Average Expected Price Change

In Table 3, we report the regression results for the average expected stock return as based on the survey, $\widetilde{\mathrm{E}}_t\,[\Delta p_{t+1}]$. As measures of "disagreement" we use the volatility-adjusted ADI_t and ANI_t. The first two columns in Table 3 correspond to Hypothesis 2 by examining the correlation between disagreement and expected future returns. As shown, ADI_t is significant at the 1% level (column 1) and ANI_t is significant at the 5% level (column 2), both taking negative values. These results clearly support Hypothesis 2.

The last three columns in Table 3 correspond to Hypothesis 3. Column 3 is when Δp_t is used as a proxy for disagreement. As the estimated coefficient for Δp_t is significantly negative at the 5% level, the first half of Hypothesis 3 is confirmed. However, the adjusted R^2 is much lower than when the disagreement measures are used. This suggests Δp_t contains a great deal of noise other than the disagreement effect among investors. Columns 4 and 5 correspond to the case where both Δp_t and $\sigma_t\,(P_{t+1})$ are included in equation (5). In both columns, the coefficient of Δp_t is not statistically significant, while the coefficient for disagreement is negative and significant. As a result, the second half of Hypothesis 3 is also supported.

[Insert Table 3 here.]

Finally, Table 4 summarizes the estimation results for TOPIX as a benchmark of comparison. Figure 4 presents for both the Nikkei JASDAQ Average and TOPIX the measure of disagreement (*disagreement*), contemporaneous return (*current return*), and survey-based expected return (*expected return*) in a single panel.

[Insert Table 4 and Figure 4 here]

Column 1 of Table 4 estimates the regression for the contemporaneous TOPIX return. The measure of disagreement ANI_t is negative and statistically significant. This result contradicts the result for the JASDAQ in Table 2 and is inconsistent with Hypothesis 1. In the early sample of Panel B, as depicted in Figure 4, there are several observations where Δp_t and ANI_t clearly move in opposite directions. These few observations strongly affect the estimation results. If the observations for 2001 are excluded from the sample, all coefficients in column 1 become statistically insignificant. Also, even though the coefficient of the volatility term is statistically insignificant, it takes a positive value and this is inconsistent with its theoretical prediction. Overall, the empirical results for the TOPIX appears to contradict the "disagreement" model, unlike the JASDAQ results.

In the regression of the survey-based expected return $\widetilde{\mathrm{E}}_t\left[\Delta p_{t+1}\right]$, the coefficient of ANI_t has a positive sign, but is statistically insignificant. On the other hand, Δp_t has a negative coefficient and is significant at the 1% level. These results are robust, even if the 2001 observations are removed from the estimation. This suggests that institutional investors in the Japanese market assumed negative autocorrelations or monthly mean-reversion in TOPIX returns from throughout 2001 until early 2005.

In the behavioral finance literature, many previous studies view the US stock market boom in 2000 as a typical example where the "disagreement model" applies. During this time, there were many IT firms which had never recorded positive profits, but whose stock prices skyrocketed because of their growth potential. It has been argued that only optimistic expectations are reflected in the stock prices of such companies and the "disagreement model" is a good description of the market for entrepreneurial stocks such as the NASDAQ during this period.

A similar argument can be made using the graphs for the Japanese market in Figure 4. In the TOPIX graph, the "disagreement" measure is higher at the beginning of the subsample, but then both the level and its fluctuation decline in the second half of the sample. On the other hand, the disagreement measure for the Nikkei JASDAQ Average increases in 2003–2004. This period corresponds to a surge in new IT firms in the Japanese stock market as represented by the rise (and eventual downfall) of Livedoor, led by Takafumi Horie. The valuation of these IT firms was questioned by many for much the same reason that the valuation of IT firms was questioned in the US in 2000.

4 Conclusions

This article examines the empirical implications of models of "disagreement" or "differences in opinion" among investors using JASDAQ market data by exploiting institutional investors' forecasts of future stock prices. We use the standard deviations of one-month ahead forecasts of stock prices as the measure of disagreement in the market. The results indicate that an increase in disagreement is associated with an increase in contemporaneous stock returns and lower average survey-based expected returns. These findings suggest that when disagreement is high, stock prices tend to reflect the opinions of more optimistic market participants, with the result that the current stock price is overvalued. However, findings obtained with TOPIX data, which represents larger firms in a more mature market, contradict the central predictions of disagreement models. One reason is that firms listed on the JASDAQ market are much smaller and the number of market participants is more limited. Consequently, institutional "limits to arbitrage", such as short-sale and liquidity constraints, are more binding and their influence on stock prices is greater.

For future research, we would like to analyze the survey data and trading volume and consider longer horizon forecasts, as well as updating the QSS Equity Survey dataset. In addition, the analysis conducted in this paper concerns stock market indexes that are not directly traded in the market. Consequently, even though the empirical results suggest the market is overvalued when disagreement is high, it also means that individual stock prices are overvalued. Hence, disagreement/overvaluation at the individual firm and aggregate market level need to be discussed and considered more carefully.

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Table 1

Definitions of Variables and Basic Statistics

P_t :	Nikkei JASDAQ Average. Closing price of first Thursday of month (= the last day of survey).
$\mu_t\left(P_{t+1}\right)$:	Average of one-month ahead forecast of Nikkei JASDAQ Average in QSS Equity survey.
$\sigma_t\left(P_{t+1}\right)$:	Standard deviation of one-month ahead forecast of Nikkei JASDAQ Average in QSS Equity survey.

$p_t = \ln(P_t)$

$\Delta p_t = \ln(P_t) - \ln(P_{t-1})$ (percent)

$\widetilde{\mathrm{E}}_t\left[\Delta p_{t+1}\right] = \ln\left(\mu_t\left(P_{t+1}\right)\right) - p_t$ (percent)

$DI_t\left(p_{t+1}\right) = \ln(\sigma_t\left(P_{t+1}\right))$

$NI_t\left(p_{t+1}\right) = \ln\left(\frac{\sigma_t(P_{t+1})}{\mu_t(P_{t+1})}\right)$

Basic Statistics

	Δp_t	$\widetilde{\mathrm{E}}_t\left[\Delta p_{t+1}\right]$	$DI_t\left(p_{t+1}\right)$	$NI_t\left(p_{t+1}\right)$
Mean	0.68	0.94	4.21	−2.98
S.D.	5.85	0.95	5.15	0.22
Max	13.17	3.78	5.15	−2.23
Min	−10.36	−2.02	3.70	−3.37
Skewness	0.04	0.10	1.09	0.73
Kurtosis	2.20	4.69	4.27	4.39

Table 2
Testing Hypothesis 1: Disagreement and Contemporaneous Stock Price Change

Estimated regressions for contemporaneous log price change of Nikkei JASDAQ Average are reported.

$$\Delta p_t = \alpha + \beta_1 \sigma_t (P_{t+1}) + \beta_2 \Delta p_{t-1} + \beta_2 cv_t$$

Sample is from January 2001 to February 2005. Refer to Table 1 for the variable definitions. An additional explanatory variable cv_t is defined by the standard deviation of daily returns for seven trading days up to one day before the day P_t is observed. This is included to control for disagreement over future stock prices caused by some exogenous shock. $ADI_t (p_{t+1}), ANI_t (p_{t+1})$ are OLS residuals from the following regressions:

$$DI_t (p_{t+1}) = \delta_0 + \delta_1 cv_t. \qquad NI_t (p_{t+1}) = \delta_0 + \delta_1 cv_t.$$

Values in parentheses are t-values for standard errors calculated using the Newey–West method. $(^{***}), (^{**}), (^{*})$ denotes that the estimated coefficients are statistically significant at the 1%, 5%, and 10% level, respectively.

Panel A: Measure of "Disagreement" is $DI_t (p_{t+1})$

	(1)	(2)	(3)	(4)	(5)
constant	-21.266^{*}	-27.079^{**}	0.737	4.439^{***}	4.399^{***}
	[−1.90]	[−2.59]	[0.79]	[2.80]	[2.73]
$DI_t (p_{t+1})$	5.206^{*}	7.862^{***}			
	[1.91]	[3.09]			
$ADI_t (p_{t+1})$			7.927^{***}	7.862^{***}	7.653^{***}
			[3.45]	[3.09]	[3.03]
Δp_{t-1}					0.052
					[0.303]
cv_t		-9.949^{***}		-6.847^{**}	-6.812^{**}
		[−4.01]		[−2.59]	[−2.44]
AdjR^2	0.048	0.189	0.122	0.189	0.174

Table 2 (continued)

Panel B: Measure of "Disagreement" is $DNI_t\,(p_{t+1})$

	(1)	(2)	(3)	(4)	(5)
constant	10.419	25.028**		4.494**	4.403**
	[0.94]	[2.24]		[2.51]	[2.46]
$NI_t\,(p_{t+1})$	3.265	6.543*			
	[0.90]	[1.86]			
$ANI_t\,(p_{t+1})$			6.255*	6.543*	6.482*
			[1.68]	[1.86]	[1.88]
Δp_{t-1}					0.116
					[0.69]
cv_t		−8.935**		−7.137**	−7.051**
		[−3.38]		[−2.65]	[−2.45]
AdjR^2	−0.005	0.102	0.030	0.102	0.097

Table 3

Disagreement and Average of Expected Stock Price Change

Estimated regressions for $\widetilde{\mathrm{E}}\left[\Delta p_{t+1}\right]$, average expected log price change of Nikkei JASDAQ Average. $\widetilde{\mathrm{E}}\left[\Delta p_{t+1}\right]$ is calculated using the current market price P_t and the survey-based average of the one-month ahead expected price $\widetilde{\mathrm{E}}\left[P_{t+1}\right]$.

$$\widetilde{\mathrm{E}}_t\left[\Delta p_{t+1}\right] = \alpha + \beta_1 \sigma_t\left(P_{t+1}\right) + \beta_2 cv_t + \gamma \Delta p_t$$

See Tables 1 and 2 for definitions of the variables and the sample period.

	(1)	(2)	(3)	(4)	(5)
constant	1.042***	1.031***	1.200***	1.128***	1.147***
	[4.39]	[3.91]	[4.93]	[4.60]	[4.07]
$ADI_t\left(p_{t+1}\right)$	−0.983***			−0.830**	
	[−3.02]			[−2.23]	
$ANI_t\left(p_{t+1}\right)$		−1.229**			−1.061*
		[−2.09]			[−1.77]
cv_t	−0.199	−0.150	−0.433	−0.332	−0.334
	[−0.36]	[−0.25]	[−0.80]	[−0.55]	[−0.51]
Δp_t			−0.035**	−0.020	−0.026
			[−1.97]	[−0.98]	[−1.36]
AdjR^2	0.045	0.036	0.005	0.036	0.038

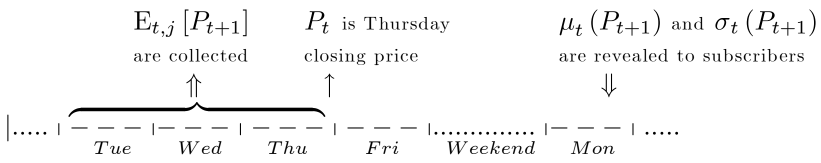
Table 4

Regressions for Contemporaneous Price Change and Average Expected Price Change of the TOPIX

See Tables 1 and 2 for definitions of the variables and the sample period.

	Δp_t	$\widetilde{\mathrm{E}}_t\left[\Delta p_{t+1}\right]$
constant	-0.531	1.420^{**}
	$[-0.28]$	$[2.60]$
$ANI_t\,(p_{t+1})$	-12.547^{***}	-1.161
	$[-3.81]$	$[-0.53]$
Δp_t		-0.072^{***}
		$[-2.74]$
cv_t	0.121	0.222
	$[0.06]$	$[0.49]$
AdjR^2	0.11	0.02

Figure 1: QSS Equity Survey and Stock Price Data

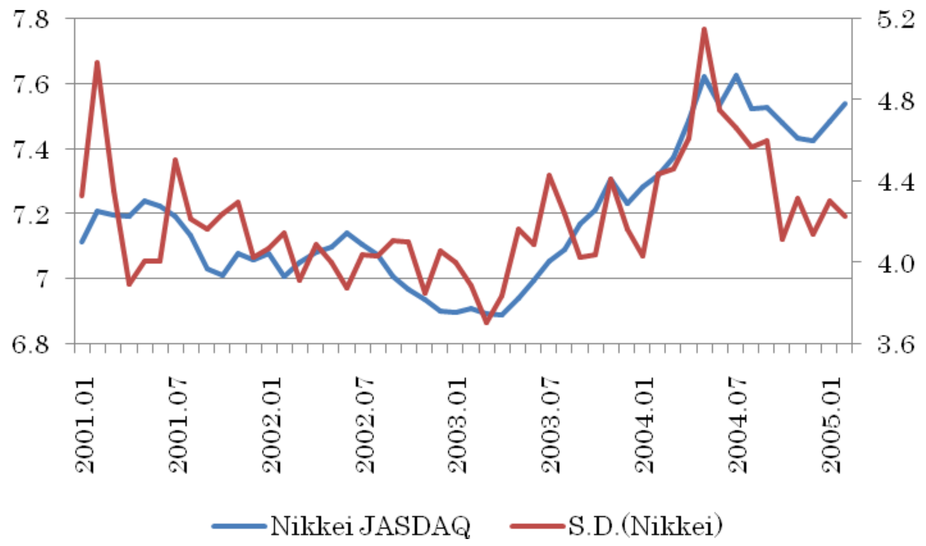


The information collected in QSS Equity Survey
$\Longrightarrow \mathrm{E}_{t,j}[P_{t+1}]$ (One-month ahead stock price forecast)

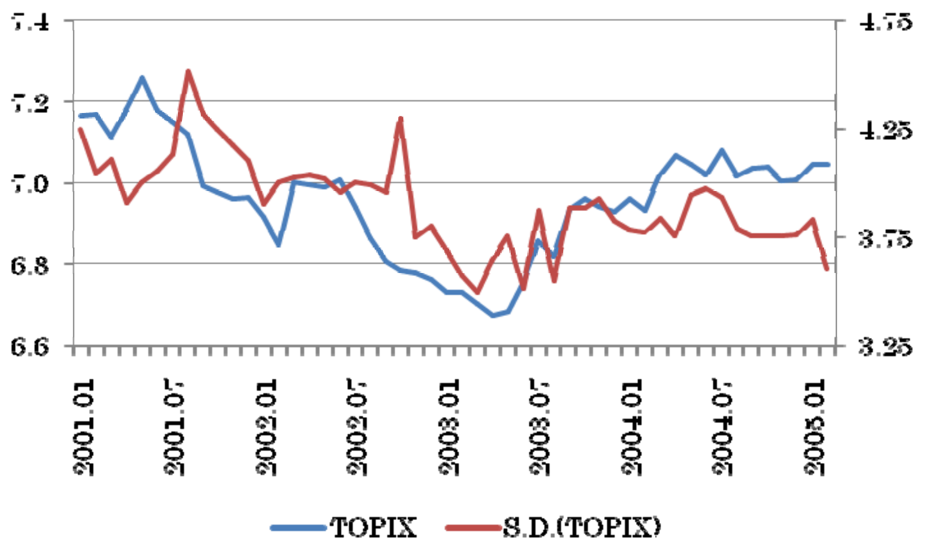
Descriptive statistics revealed to the information subscribers:
$\mu_t(P_{t+1}) = \sum_{j=1}^{J} \mathrm{E}_{t,j}[P_{t+1}] / (J-1)$
$\sigma_t(P_{t+1}) = \left(\sum_{j=1}^{J} (\mathrm{E}_{t,j}[P_{t+1}] - \mu_t(P_{t+1}))^2 / (J-1)\right)^{1/2}$

Figure 2: Current Price and the Standard Deviation of the One-Month Ahead Forecasts

Panel A: Nikkei JASDAQ Average

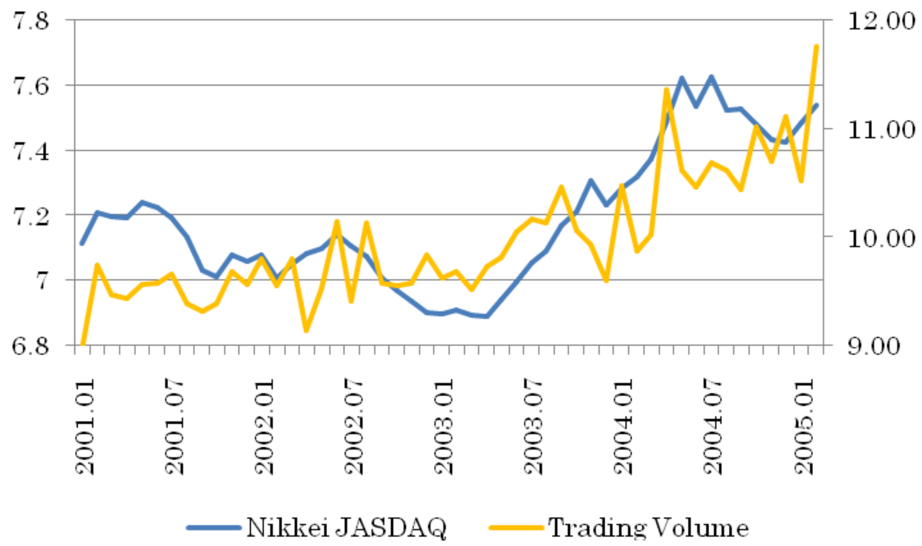


Panel B: TOPIX



Current Nikkei JASDAQ Average, TOPIX (left-hand scale), and the standard deviation of one-month ahead forecasts in the QSS Equity Survey (S.D.; right-hand scale). All variables shown are in natural logs.

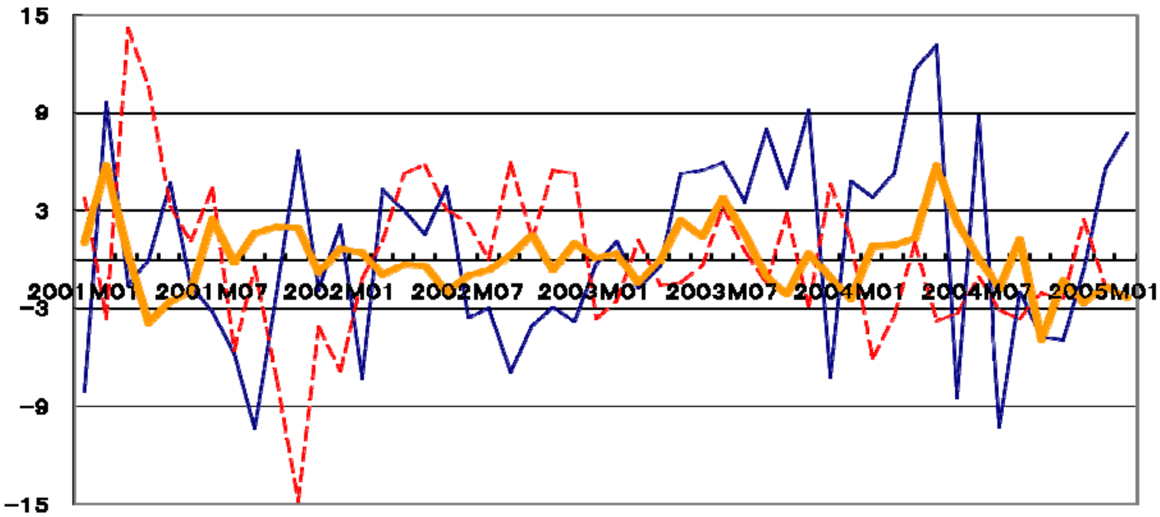
Figure 3: Price and Trading Volume for Nikkei JASDAQ Average



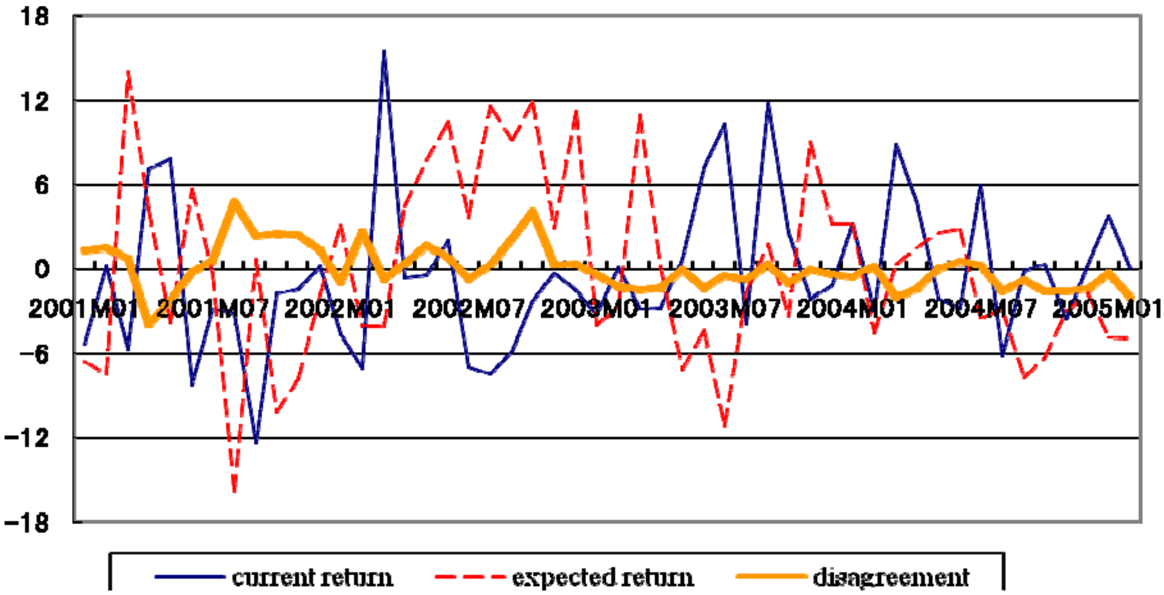
Nikkei JASDAQ Average (left-hand scale) and trading volume (right-hand scale). Trading volume is seven-day average. All variables shown are in natural logs.

Figure 4: Disagreement, Contemporaneous Return, and Average Expected Return

Panel A: Nikkei JASDAQ Average



Panel B: TOPIX



current return: current log price change

expected return: average expected log price change in survey

$$= \left(E_t[\Delta p_{t+1}] - Avg\left(E_t[\Delta p_{t+1}]\right)\right) \times 5$$

disagreement: Measure of "disagreement" $= ANI_t \times 10$