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Immediate Disclosure or Secrecy?
The Release of Information in Experimental Asset Markets

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Working Paper 2001-5
April 2001

Working Paper Series

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Abstract: The Federal Reserve has made significant changes in its predisposition to release information over time. This paper reports the results of experimental asset markets designed to investigate how the public disclosure of uncertain information affects market and individual outcomes. In one set of markets, no information is released at the beginning of each trading year. In two other sets, an imperfect pre-announcement of the state of nature is disclosed. The reliability of the pre-announcement (60 percent and 90 percent) varies across treatments. Halfway through each trading year, the state of nature is revealed. By year-end, price deviations from Bayesian predictions are similar across all treatments; however, price volatility is significantly higher and allocational efficiency significantly lower with a pre-announcement that reflects substantial uncertainty. Furthermore, when the reliability of the pre-announcement is low (60 percent), the distribution in profit across traders is significantly greater even though the average profit is similar across treatments. Thus, in a highly uncertain environment better outcomes may actually result when information is withheld.

JEL classification: E58, C9

Key words: information disclosure, monetary policy, secrecy, asset markets, rational expectations

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The financial support of the Federal Reserve Bank of Atlanta is gratefully acknowledged. The authors thank Stas Nikolova for research assistance. The views expressed here are the authors' and not necessarily those of the Federal Reserve Bank of Atlanta or the Federal Reserve System. Any remaining errors are the authors' responsibility.

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Immediate Disclosure or Secrecy?

The Effects of Information Release in Experimental Asset Markets

Speculation surrounding future monetary policy action abounds. The Federal Reserve has more information about the state of the economy than does the general public. Because it has an important information advantage and its decisions provide signals of this information, markets react to Federal Reserve actions (Romer and Romer 2000). In recent years markets have witnessed decreasing uncertainty surrounding Federal Reserve action as information has been disclosed more freely. However, if markets are prone to overreaction to information, Federal Reserve signals may be destabilizing (De Bondt and Thaler 1985, 1987).

This paper reports the results of an experiment designed to examine the effect of the disclosure of uncertain information in asset markets. In some markets a public pre-announcement provides information to traders on the state of the world. The pre-announcement reflects uncertainty. In other markets, no pre-announcement is made. The results show that information disclosure reduces uncertainty and enhances efficiency *if* the information is a reliable predictor of the future state of the world. However, when a pre-announcement reflects substantial uncertainty, market and individual outcomes deteriorate. Market participants may fail to properly adjust for the uncertain nature of the information. In such a situation, withholding information can result in a superior outcome.

An experimental method permits an investigation that cannot be conducted using data from naturally occurring markets. Importantly, the nature of information and its release in the market can be carefully managed. We can control whether a pre-announcement is made and, if so, the uncertainty associated with the information disclosure. Further, we are able to control

investors' preferences for state realizations. Hence, an experimental approach allows us to isolate of the effects of disclosure and uncertainty on market outcomes.

The Federal Reserve has changed its stance on transparency and openness of policy actions over time (Bomfim and Reinhart 2000; Ireland 2000). Traditionally, mystique surrounded the Federal Reserve who argued that secrecy was in the public interest. In 1975 the Federal Open Market Committee (FOMC) was sued under the Freedom of Information Act to allow public access to the FOMC policy directive and minutes after each meeting (Goodfriend 1986). Although the 1981 ruling favored the FOMC, the Federal Reserve was for the first time required to provide an open defense of secrecy. Inappropriate market reaction to information disclosure was included in the arguments put forth.

Since that time, the Federal Reserve has disclosed information more freely. For example, in May 1999 Federal Reserve officials began issuing statements after FOMC meetings intended to provide information on their predisposition, or bias, toward changes in future interest rates. Although this disclosure policy was aimed at reducing uncertainty, some have argued that more confusion resulted. The popular press suggests that markets "have overreacted, sometimes treating the bias as a guarantee of action at the next meeting when that wasn't the intended signal" (Schlesinger 1999). Even more recently, FOMC members voted to change the committee's characterization of the future. Instead of reporting its judgment of the potential for changes to the federal funds rate, the consensus was to describe "the Committee's perception of the risks in the foreseeable future to the attainment of its long-run goals" (*Federal Reserve Bulletin* April 2000, page 288).

This paper investigates whether the disclosure of uncertain information is destabilizing. Although prior research has examined the dissemination of information in market settings, we

are aware of no study of the effect of public announcements of uncertain information.[1] To provide insight into the reaction of markets to the release of uncertain information, market pricing, the re-allocation of certificates, and other aspects of individual behavior are examined. Across the markets, no significant differences in price deviations from predictions, trading volume, and average profit are observed. However, price volatility and profit dispersion are significantly higher and allocational efficiencies significantly lower when highly uncertain information is released, as compared to markets with more reliable information or even those in which information is withheld.

The remainder of this paper is organized as follows. After providing an overview of the experimental design, the paper the paper describes, in detail, the experimental procedures. Next, it presents the experimental results and offers discussion. Lastly, the paper provides concluding remarks and directions for future research.

1. Experimental Method

1.1 *Overview and Design*

Nine market sessions were conducted, in addition to two pre-tests. Each market consisted of 10 to 14 four-minute years during which participants traded an asset with a one-year life.[2] All markets had nine traders and all traders were inexperienced in that none participated in an earlier session. Participants were endowed with two trading certificates, which earned dividends at year-end. The dividend per certificate varied across participants and was determined by a randomly occurring state of nature, where two equally likely states (X and Y) were possible.

Information concerning the state of nature varied across markets and across time within each market year. In three markets, participants had no information except the priors concerning the dividend to be paid when trading commenced. In six other markets, information concerning the state of nature was publicly announced at the beginning of each trading year. This pre-announcement indicated whether the X-dividend or Y-dividend would be paid: however, it was not always reliable. In three markets, the information accuracy was 60% so that the pre-announcement would, on average, reveal the true state of nature 60% of the time and the wrong state 40% of the time. In another three markets, the accuracy of the public pre-announcement was 90%. In all sessions, the true state of nature was publicly announced half way through each trading year. Thus, although there was uncertainty about the dividend to be paid during the first two minutes of the trading year in all markets, traders were fully aware of the state of nature in the latter two minutes.

1.2 *Experimental Procedures*

At the beginning of each session, participants received a set of instructions that an experimenter read aloud.[3] Participants were primarily business majors, in at least their third year of study at Georgia State University and Georgia Tech. The average compensation across the 81 traders was $27.91, which includes trading earnings plus a $2.00 bonus if on time for the session and $2.00 for completing the post-experiment questionnaire.

All markets were organized as double oral auctions. Each trader was endowed with two trading certificates and $50.00 at the beginning of each year. The cash endowment was a loan that was repaid at the end of each market year. Traders were free to make verbal offers to buy or sell one certificate at a designated price at any time, and all offers were publicly announced and

recorded. Outstanding offers stood until accepted or replaced by a better bid or ask price. Short sales were not permitted and trading certificates were not carried across years. Participants were not informed of the number of years to be conducted and each market required roughly two and one-half hours to complete.

Participants received a dividend for each certificate held at year-end. The dividend received depended on the trader's dividend structure. Three trader types participated in each market, with three traders taking each type.[4] Table 1 summarizes the dividend structure. Participants were instructed that their dividend structure was private information and should not be revealed. Traders knew dividends varied across the group but did not know each other's particular dividends.

In three markets (NoPAnn1-3), trading began with participants only knowing that the two states (X and Y) were equally likely. In the other markets, an experimenter publicly announced information concerning the state of nature before trading commenced. In three markets (60PAnn1-3) the accuracy of the pre-announcement was 60% and in another three markets (90PAnn1-3) the accuracy of the pre-announcement was 90%. After the pre-announcement, if one was given, participants were asked to record their reservation price. According to the experimental instructions, this price was an "estimate of the price at which you would be indifferent between buying and selling certificates during the upcoming year." To motivate participants to record their reservation prices, they received 25 cents each period the prices were recorded. This additional cash balance could not be used for trading.

Uncertainty regarding the dividend to be paid was resolved half way through the trading year. After two minutes, trading was halted and an experimenter publicly announced the state of nature in all markets. The announcement was always 100% accurate. Then participants were

again asked to record their reservation prices. They were told that the second reservation price should be their estimate of the price at which they were indifferent between buying and selling for the final two minutes of the trading year.

At the end of each year, participants calculated their earnings from certificates by multiplying the number of certificates held by their dividend. Because the cash endowment was returned, the profit each year was calculated by adding (subtracting) cash on hand above (below) $50.00 to earnings from certificate holdings.

Subsequent market years proceeded similarly, with cash and certificate endowments reinitialized at the start of each year. At the end of each market session, traders summed their earnings over all trading years and were paid in cash. During this time participants completed a post-experiment questionnaire designed to collect general information and elicit their views on the experiment.

2. Market Behavior

2.1 *Predictions*

Price and allocation predictions are derived based on the premise that certificates move toward the trader type with the highest equilibrium asset value. At any lower price, excess demand exists. As the dividend structure in Table 1 suggests, the X state of nature is the higher payoff state as all trader types receive a higher dividend per certificate. However, the ordering of the payoffs across trader types changes in the lower payoff state of nature (Y). Thus, allocation predictions change.

Using Bayes' theorem and assuming risk neutrality, the dividend distributions given in Table 1 result in the price and allocation predictions reported in Table 2. No allocation

prediction is made when there is no announcement because any allocation is consistent with no information. For markets NoPAnn1-3 there is no information prior to the announcement of the true state of nature and the two states have equal prior and posterior probabilities.

Subsequently, market reaction to uncertain information is examined. The predictions given in Table 2 allow comparison of market pricing across pre-announcement and state announcement periods, as well as across market treatments. In addition, the optimal re-allocation of trading certificates among participants is examined based on these predictions.

2.2 *Market Pricing*

Table 3 reports the mean of the average price in each treatment excluding the first three trading years, with standard deviations given below in parentheses.[5] In the pre-announcement trading period, prices sometimes settle at levels above the Bayesian price predictions, whereas in other cases prices are consistently below the predictions. In the 60PAnn1-3 markets, when the pre-announcement indicates that the state is X, the price frequently settles (average of 89.91) above the price prediction of 74. In contrast, in the 90PAnn1-3 markets the average price is (93.13) less than the price prediction (101) when the higher payoff state is suggested by the pre-announcement. In the lower payoff state of nature (Y), the price settles close to Bayesian price predictions of 64 and 61, respectively, in the 60PAnn1-3 and 90PAnn1-3 markets.

Subsequent to the announcement of the state of nature halfway through the trading period, the price settles, on average, slightly below the predictions of 110 and 60 for the X and Y states, respectively, in most cases. Additional analysis of price behavior indicates that traders react to the announcement of the true state of nature. The price in the pre-announcement trading

period is significantly different from the price after the announcement of the state of nature in every case at $p < 0.015$ using parametric and non-parametric tests.

To more formally compare market pricing across pre-announcement and state announcement periods, Table 4 reports the absolute value of the deviation in average price from the Bayesian price prediction given in Table 2 for each period and treatment, with standard deviations below in parentheses.[6] Wilcoxon z-statistics in the final column are for a test of the null hypothesis that the absolute price deviation is equal before and after the actual state of nature is announced, with p-values reported below in brackets. When there is no pre-announcement, the deviation in price from the prediction declines significantly after the state announcement. However, with a pre-announcement, a significant change in the price deviation is not observed after the state announcement. Even when the reliability of the pre-announcement reflects substantial uncertainty as in the 60PAnn1-3 markets, significant adjustments in price toward predictions are not observed.

To further examine market dynamics, absolute price deviations from Bayesian price predictions are used in a comparison of market pricing across market treatments. The final row of Table 4 reports Kruskall-Wallis χ^2-statistics for a test of the null hypothesis that the absolute price deviation is equal across treatments, again with p-values reported below in brackets. The price deviation from the predicted price is significantly different when the pre-announcement is highly reliable (90PAnn1-3), but no significant difference across treatments is observed after the actual state of nature is disclosed.

Next price volatility is examined. In Panel A of Table 5 the standard deviation of the average trading price per period for each treatment in the pre-announcement trading period is reported, conditional on the state of nature suggested by the pre-announcement information. The

final row reports an F-statistic for Levene's test for equality of variances across treatments, with p-values below in brackets. When the pre-announcement indicates that the state of nature is the high payoff state (X), price volatility is significantly different in the 60PAnn1-3 markets.

Panel B of Table 5 reports the standard deviation of the average price for each treatment in the state announcement period, conditional on the actual state of nature and the accuracy of the pre-announcement. Interestingly, the price volatility is significantly greater in the 60PAnn1-3 markets even when the pre-announcement is accurate. Although significant differences are not observed in price deviations from predictions after the state of nature is announced (see Table 4), important differences in price volatility are observed.

2.3 *Re-allocation of Certificates*

To further examine market behavior, the movement and distribution of certificates across traders is examined. Significant differences in the volume of trade across periods and treatments are indicated. Table 6 reports the average number of transactions for each treatment for the pre-announcement and state announcement periods. In the announcement period, volume figures are conditional on the accuracy of the pre-announcement. The standard deviation of the volume is reported below in parentheses. Wilcoxon pairwise tests of the hypothesis of equal trading volume before and after the announcement of the state for each treatment are reported in the final column. The higher price volatility observed in the 60PAnn1-3 markets (see Table 5) does not translate into greater trading volume. Not surprisingly, volume is higher when the pre-announcement is inaccurate as certificates move toward the traders with higher valuations. When the pre-announcement is accurate, significant changes in volume do not follow the announcement of the actual state of nature.

Next the movement of certificates across trader types is examined. Measures of allocational efficiency indicate that certificates move toward those with higher valuations after the announcement of the true state of nature. Table 7 reports the percentage of trading certificates held by the trader type with the highest expected value, conditioned on available information, based on the allocation predictions reported in Table 2. The table does not report an efficiency measure for the NoPAnn1-3 markets in the pre-announcement period because no allocation prediction is made.[7] Standard deviations are reported in parentheses below each percentage. The final column of the table reports a Wilcoxon matched pairs test of equal efficiency before and after the announcement of the state and the final row reports an F-test of the hypothesis of equal efficiency across treatments. In the pre-announcement trading period, allocational efficiencies are relatively low with 50.1% and 57.7% of the certificates held by traders with the highest valuations in the 60PAnn1-3 and 90PAnn1-3 markets, respectively. These allocational efficiencies are marginally different ($p = 0.08$). However, after the announcement of the true state of nature, efficiencies are significantly higher ($p < 0.01$) in the NoPAnn1-3 (90.6%) and the 90PAnn1-3 (83.5%) markets as compared to the 60PAnn1-3 (70.1%) markets. Importantly, allocational efficiencies are lower when highly uncertain information is publicly disclosed (60PAnn1-3) as compared to the efficiencies when information in withheld (NoPAnn1-3). Allocational efficiencies increase significantly after the announcement of the true state of nature ($p < 0.01$) in both the 90PAnn1-3 markets and the 60PAnn1-3 markets.

2.4 *Individual Behavior*

Further examination of individual behavior gives insight into the different outcomes across treatments. A comparison of trading profit across treatments indicates whether information disclosure benefits participants equally. Table 8 reports the average trading profit and the average of the standard deviation of trading profit for each treatment. The final row of the table reports Kruskall-Wallis χ^2-statistics for a test of the null hypothesis that the averages are equal across treatments, with p-values reported below in brackets. Across the three treatments, no significant difference in trading profit is observed ($p = 0.17$). Yet, a significant difference in the average standard deviation of trading profit is detected. In the 60PAnn1-3 markets, the standard deviation is significantly larger even though the mean profit is not statistically different. This evidence suggests that the distribution of earnings across participants is significantly more dispersed when highly uncertain information is disclosed than when information is withheld.

Participants' self-reported reservation prices provide final insights into individual behavior in these asset markets. Table 9 reports the average reservation price and the average observed price each period for each treatment, with standard deviations reported below in parentheses. The z-statistic in the final column is for a test of the null hypothesis that the first and second reservation prices equal the observed prices, with p-values reported below in brackets. The first reservation price is reported by traders at the beginning of the pre-announcement trading period after the pre-announcement (if one is given), whereas the second reservation price is reported after the state is revealed in the announcement trading period. Although not always significantly so, average reservation prices are consistently less than

average observed prices. On average, traders in all treatments are willing to pay more for certificates than they indicate they are, ex ante.

Further analysis of reservation prices reveals that the largest revision in reservation prices across the pre-announcement and announcement periods is observed in the 60PAnn1-3 markets, with the smallest revision in the 90PAnn1-3 markets. In addition, dispersion in beliefs as reflected in the reservation prices is largest in the 60PAnn1-3 markets, with significantly lower dispersion in the NoPAnn1-3 markets as compared to the other two treatments. When reservation prices are compared to risk-neutral price predictions, deviations are significantly larger in the 60PAnn1-3 markets as compared to the NoPAnn1-3 markets. Consistent with evidence on market and individual outcomes discussed above, individuals appear to be subject to greater uncertainty when highly uncertain information is publicly disclosed (60PAnn1-3) as compared to the environment when information in withheld (NoPAnn1-3).

3. Discussion and Concluding Remarks

This paper reports the results of nine asset markets conducted to investigate how the public disclosure of uncertain information affects market and individual outcomes. In a series of markets, no information is released at the beginning of trading in each market year. In other markets, a pre-announcement of the state of nature is disclosed. The reliability of the pre-announcement (60% and 90%) varies across treatments. In all markets the true state of nature is announced halfway through the trading year.

After disclosure of the state of nature, price deviations from Bayesian predictions are similar across all treatments, regardless of the reliability of the pre-announcement or even of whether a pre-announcement is made. However, price volatility is significantly higher and

allocational efficiency significantly lower with a disclosure that reflects substantial uncertainty. Furthermore, when the reliability of the pre-announcement is relatively low (60%), the distribution in profit across traders is significantly greater even though the average profit is similar across treatments. Thus, superior market and individual outcomes are observed when information is withheld as compared to markets in which uncertain information is released.

These results have important policy implications. The Federal Reserve has more liberally disclosed information concerning their future plans in recent years. This practice improves outcomes if policymakers are confident of their ability to reach their targets. However, in a highly uncertain environment, better outcomes may actually result when information is withheld.

This paper provides an initial empirical investigation of public information disclosure in asset markets. Much remains to be addressed. Future research designs might include an endogenous policymaker who responds to market behavior. In addressing issues such as these, an experimental method is particularly beneficial because it allows a controlled investigation that cannot be conducted in naturally occurring markets.

TABLE 1
Dividend Distributions

Trader Type	Dividend		Expected Value
	X	Y	
I	110	20	65
II	90	40	65
III	70	60	65
Probability	0.50	0.50	

TABLE 2
Asset Price and Allocation Predictions

Accuracy	Price Predictions for each Announced State			Allocation Predictions for each Announced State		
	None	X	Y	None	X	Y
No announcement	65	-	-	I, II, or III	-	-
60% accuracy	-	74	64	-	I	III
90% accuracy	-	101	61	-	I	III
100% accuracy	-	110	60	-	I	III

Notes: Price and allocation predictions assume risk neutrality. Predictions are premised on the movement of certificates toward traders with the highest equilibrium asset value.

TABLE 3
Average Prices

Markets	Pre-Announcement		State Announcement	
	X	Y	X	Y
NoPAnn1-3	76.50 (7.15)		97.98 (7.30)	56.20 (2.98)
60PAnn1-3	89.91 (17.51)	65.36 (9.61)	91.09 (16.57)	63.54 (11.76)
90PAnn1-3	93.13 (11.11)	61.39 (6.87)	99.69 (7.99)	56.10 (3.08)

Notes: The table reports the mean of the average price in each treatment with standard deviations given below in parentheses, excluding the first three trading years. For markets NoPAnn1-3 there is no information prior to the announcement of the true state of nature and the two states have equal prior probabilities.

TABLE 4
Tests of Price Predictions

Markets	Pre-Announcement Period	State Announcement Period	Wilcoxon z-statistic
NoPAnn1-3	0.185 (0.10)	0.085 (0.06)	-3.33 [0.00]
60PAnn1-3	0.164 (0.14)	0.103 (0.08)	-1.33 [0.18]
90PAnn1-3	0.087 (0.08)	0.081 (0.06)	-0.56 [0.57]
Kruskall-Wallis χ^2	15.97 [0.00]	0.52 [0.77]	

Notes: The table reports the absolute value of the deviation in average price from the price prediction given in Table 2 for each treatment. Standard deviations are reported below in parentheses. In the final column, the table reports Wilcoxon z-statistics for a test of the null hypothesis that the absolute price deviation is equal before and after the actual state of nature is announced, with p-values reported below in brackets. In the final row, the table reports Kruskall-Wallis χ^2-statistics for a test of the null hypothesis that the absolute price deviation is equal across treatments, again with p-values reported below in brackets.

TABLE 5
Comparisons of Volatility for Each Announced State

Panel A: Pre-Announcement Period

Markets	State Announcement	
	X	Y
NoPAnn1-3	7.15	7.15
60PAnn1-3	17.51	9.61
90PAnn1-3	11.11	6.87
Levene Test	87.25 [0.00]	1.25 [0.29]

Panel B: State Announcement Period

Markets	Pre-Announcement Accuracy	State Announcement	
		X	Y
NoPAnn1-3	Accurate	7.30	2.98
60PAnn1-3		14.61	9.07
90PAnn1-3		8.48	3.16
Levene Test		4.73 [0.02]	10.60 [0.00]
NoPAnn1-3	Inaccurate	7.30	2.98
60PAnn1-3		17.87	18.79
90PAnn1-3		6.86	2.55
Levene Test		10.33 [0.00]	15.17 [0.00]

Notes: The table reports the standard deviation of the average trading price per period for each treatment, for the pre-announcement and state announcement periods, conditional on the announced state of nature. In the state announcement period, price volatility is also reported conditional on the accuracy of the pre-announcement information. The F-statistic for Levene's test for equality of variances across treatments is reported, with p-values below in brackets.

TABLE 6
Volume of Trade
Before and After the Announcement

Markets	Pre-Announcement Accuracy	Pre-Announcement Period	State Announcement Period	Wilcoxon z-statistic
NoPAnn1-3	-	5.31 (1.28)	11.50 (3.06)	-4.95 [0.00]
60PAnn1-3	Accurate	6.23 (2.58)	6.29 (2.61)	-0.25 [0.81]
	Inaccurate		11.25 (2.60)	-2.91 [0.00]
90PAnn1-3	Accurate	6.06 (2.01)	5.19 (1.98)	-1.13 [0.26]
	Inaccurate		12.17 (3.76)	-2.06 [0.04]

Notes: The table reports the average number of transactions in each treatment in the pre-announcement and state announcement trading periods, conditional on pre-announcement accuracy in the latter trading period. The standard deviation of the volume is reported below in parentheses. For markets NoPAnn1-3 there is no pre-announcement. In the final column, the table reports Wilcoxon pairwise tests of the hypothesis of equal trading volume before and after the announcement of the state for each treatment, conditional on pre-announcement accuracy.

TABLE 7
Allocational Efficiencies

Markets	Pre-Announcement Period	State Announcement Period	Efficiency Comparison Before and After Announcement
NoPAnn1-3	-	0.906 (0.13)	-
60PAnn1-3	0.501 (0.16)	0.701 (0.21)	-4.10 [0.00]
90PAnn1-3	0.577 (0.16)	0.835 (0.21)	-4.79 [0.00]
Efficiency Comparison Across Markets	3.29 [0.08]	8.74 [0.00]	

Notes: The table reports the percentage of trading certificates held by the trader type with the highest expected value, conditioned on available information. The allocation predictions are reported in Table 2. The Table does not report an efficiency measure for the NoPAnn1-3 markets in the pre-announcement period because no allocation prediction is made. Standard deviations are reported in parentheses below each percentage. In the final column, the table reports a Wilcoxon matched pairs test of equal efficiency before and after the announcement of the state. In the final row, the table reports an F-test of the hypothesis of equal efficiency across treatments.

TABLE 8
Trading Profit

Markets	Average Trading Profit	Average Standard Deviation of Trading Profit
NoPAnn1-3	161.86	43.87
60PAnn1-3	150.23	66.56
90PAnn1-3	157.01	38.78
Kruskall-Wallis χ^2	3.59 [0.17]	9.05 [0.01]

Notes: The table reports the average trading profit and the average of the standard deviation of trading profit for each treatment. In the final row, the table reports Kruskall-Wallis χ^2-statistics for a test of the null hypothesis that the averages are equal across treatments, with p-values reported below in brackets.

TABLE 9
Comparisons of Reservations Prices
Before and after the Announcement

Panel A: First Reservation Price

Markets	Pre-announce-ment	Average Reservation Price	Average Observed Price	z-statistic
NoPAnn1-3	None	72.71 (16.13)	76.50 (6.62)	-3.927 [0.000]
60PAnn1-3	X	84.13 (20.66)	89.91 (4.95)	-0.840 [0.401]
	Y	57.96 (15.23)	65.36 (6.22)	-2.635 [0.008]
90PAnn1-3	X	85.79 (16.13)	93.13 (6.00)	-2.869 [0.004]
	Y	45.74 (12.45)	61.39 (3.63)	-3.724 [0.000]

Panel B: Second Reservation Price

Markets	State	Average Reservation Price	Average Observed Price	z-statistic
NoPAnn1-3	X	90.21 (9.26)	97.98 (9.30)	-3.408 [0.001]
	Y	53.75 (4.36)	56.20 (2.98)	-1.823 [0.068]
60PAnn1-3	X	94.56 (9.83)	96.66 (12.12)	-1.490 [0.136]
	Y	52.56 (8.42)	56.69 (5.13)	-2.072 [0.038]
90PAnn1-3	X	88.85 (6.72)	99.69 (7.99)	-3.351 [0.001]
	Y	47.30 (6.97)	56.10 (3.08)	-3.201 [0.001]

Notes: The table reports the average reservation price and the average observed price each period for each treatment, with standard deviations reported below in parentheses. The first (second) reservation price is reported at the beginning of the pre-announcement (announcement) trading period. The z-statistic is for a test of the null hypothesis that the reservation prices equal the observed prices, with p-values reported below in brackets.

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ENDNOTES

[1] Many researchers have examined information use in experimental asset markets. For example, Plott and Sunder (1982) find that private information is fully disseminated whereas Ackert and Church (1998) find that incomplete, private information is only partially disseminated. In their study of the effects of imperfect, private information, Ackert, Church, and Shehata (1997) find that prices deviate more often from Bayesian predictions when the degree of uncertainty associated with private information increases.

[2] Prior to conducting the sessions, fourteen years in each market were planned. However, due to time constraints, three markets fell short.

[3] The instructions are available from the authors upon request.

[4] The trader types reflect various differences in preferences that arise in naturally occurring markets. For example, different preferences across agents may result from different tax brackets, risk preferences, or portfolio compositions. See Copeland and Friedman (1987) and Cason and Friedman (1996).

[5] All statistical tests reported subsequently exclude the first three trading years. In these initial years, participants are becoming familiar with the trading procedures and functioning of the market. Inferences, however, are generally similar when these years are included in the analysis.

[6] Price deviations from Bayesian predictions are used in testing to compare how close prices are to the predictions across pre-announcement and state announcement periods, as well as across market treatments.

[7] Although no allocation prediction is made for the NoPAnn1-3 markets in the absence of information, we can examine whether certificate holdings are dispersed equally across trader types. An F-test and non-parametric, Kruskall-Wallis test indicate that the null hypothesis of equal certificate holdings across trader types cannot be rejected.