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Investigation of the Association between Disclosure and Asymmetric Information

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Abstract
The purpose of this paper is to investigate the relation between voluntary information and bid-ask spread. This study utilizes 134 firm-year observations from registered companies in Tehran Stock Exchange in 2013. We use hand-collected dataset of voluntary information from annual reports by using the disclosure index of Botosan (1997). The findings of this study show that bid-ask spread is lower for firms with the high amount of voluntary information. These findings suggest that firms with larger trading volume and greater market value had lower bid-ask spread.

Keywords: Voluntary Information, Bid-Ask Spread, Information Asymmetric, And Adverse Selection.

Introduction

Financial transparency and information disclosure are extremely important elements of good corporate governance. Better transparency and disclosure practices can help shareholders to gain a better understanding of firms' management practices, thereby helping to reduce the information asymmetry faced by investors and market makers. Finance theory suggests that firms can reduce the adverse selection component of the bid-ask spread by disclosing private information.

Higher bid-ask spreads arise because market makers are uninformed and thus seek compensation for expected losses in trades with informed traders (Kim and Verrecchia, 1994). Market makers increase bid-ask spreads so that their trading losses with informed investors are offset by trade gains with uninformed investors (Glosten and Milgrom, 1986). Diamond and Verrecchia (1991) suggest that greater disclosure reduces the amount of information revealed by a larger trade, thereby reducing the adverse price impact associated with such trades.

In another study, Pevzner (2007) state that disclosure reduces information asymmetry and increases liquidity (decrease bid-ask spread) via two channels. First, it levels the current information playing field between informed and un-informed investors by communicating private information hitherto unknown to uninformed investors (Pevzner, 2007). Second, a commitment to future greater voluntary information reduces incentives for future collection of private information and thus increases liquidity ex-ante (Leuz and Verrecchia, 2000).

However, despite the large number of theoretical papers with predictions related to voluntary disclosure's effect on bid-ask spread, but little empirical evidence exists to support these claims. In this relation, Botosan (1997) believes that firm's benefit from increased disclosure remains a controversial issue in asset pricing theory.

Additionally, from previous literature, it is apparent that the most of studies were conducted in developed markets such as United States (U.S.) and European. Since findings for developed countries might not be directly transferable to emerging markets, therefore, more work is necessary to obtain a clearer picture of the role of voluntary information on bid-ask spread.

We regress the voluntary information, ratings on bid –ask spread after controlling for trading volume, market value, and number of transactions in emerging markets (Iranian Stock Exchange). The findings show that spreads are lower for firms with the high amount of voluntary information. We also found that firms with larger trading volume and greater market value had lower bid-ask spread, but the results show that number of transaction does not have any impact on bid-ask spread.

Data

We analyze data for stocks traded on the Tehran Stock Exchange (TSE) to examine whether voluntary information affects on bid-ask spread. We obtain intraday trades and quotes bid-ask data from package Tadbir Pardaz (TP). The measurement of amount of voluntary information is based on the information firms provide in their annual reports to shareholders. There are about 440 firms in the stock exchange of Tehran, but we restrict in calculate quote bid and ask thus, the sample consists trade and quote records from 134 firms for the period 2013.

Voluntary Information Score

Within the voluntary information literature, research has used several proxies for firms' voluntary information practices, including management forecasts, conference calls, self-constructed scores, and externally generated scores. We select a self-constructed measure as our main proxy for a firm's voluntary information for two reasons. First, Healy and Palepu (2001) note that self-constructed measures have increased confidence that the metric captures what it is intended to capture. Second, because a self-constructed metric can be calculated for any firm (Francis, Nanda and Olsson, 2007). We use Botosan's disclosure index to measure the amount of voluntary information that considers information items disclosed in the annual reports. The disclosure elements pertain to five categories of information: (1) background information (e.g., description of the business); (2) historical results (e.g., does the firm provide a history of return on asset information and, if so, for how many years?); (3) key, non-financial statistics (e.g., number of employees); (4) forecasted information (e.g., forecasted market share); and (5) management discussion and analysis, MD & A (e.g., discussion of change in sales). Similar to Botosan (1997), we combine the scores coded for each information element, across items and

categories, and rank the scores to obtain an ordinal measure of the firm's disclosure. Table 1 summarizes the major elements of voluntary information.

TABLE 1: The Elements of Voluntary Disclosure

Background Information
- Statement of corporate goals or objectives
- Barriers to entry are discussed
- Competitive environment
- Principle products
- Principle markets

Five-Year Summery of Historical Results
- Return on assets or sufficient information to compute return on assets
- Not profit margin or sufficient information to compute net profit margin
- Asset turnover or sufficient information to compute asset turnover
- Return on equity or sufficient information to compute Return on equity
- Summary of sales and net income for most recent eight quarters

Key Non-Financial Statistics
- Number of employees
- Average compensation per employee
- Order backlog
- Percentage of sales in products designed in the last five years
- Market share
- Units sold
- Unite selling price
- Growth in units sold

Projected Information
- Forecasted market share
- Cash flow forecast
- Capital expenditures
- Profit forecast

Management Discussion and Analysis
- Change in sales
- Change in operating income
- Change in cost of goods sold
- Change in gross profit
- Change in selling and administrative expenses
- Change in interest expense
- Change in net income
- Change in inventory
- Change in accounts receivable
- Change in capital expenditure or R&D
- Change in market share

Bid-Ask Spread

Bid-ask spread is the difference between bid price, which the dealer is willing to pay for a security and the higher ask price at which the dealer is willing to sell the security. The bid-ask spread measure used in this paper is the relative quoted bid-ask spread. Our data are obtained primarily from the Trade and Quote (TAQ) database, which contains intraday transactions data (trades and quotes) for 134 securities listed on the Tehran Stock Exchange (TSE).
Similar to Stoll (2000) we measure the relative quoted bid-ask spread as the difference between the bid and ask prices divided by their average.

$$SPREAD = \frac{AP - BP}{(AP + BP)/2} \times 100$$

The data of quoted bid and ask are dropped if they meet any of the following conditions:
(1) A stock has lower of 200 trading days in a fiscal year (2) Trades recorded before the open or after the close (3) Unavailable firm at the end of the fiscal year.

Control Variables

The generally accepted factors, that determine the bid-ask spread, are firm size, leverage, volume, number of transactions and market value (Stoll, 2000 and Chen et al., 2007). In accordance with the empirical evidence provided by (Stoll 2000), as well as the other aforementioned studies, we predict that any increase in the dollar volume, the number of trades and the market value will lead to a lowering of the spread. We include these factors as control variables in our regressions.

Volume is measured the daily Rial volume average of all trading days for firm. Number of transactions is the number of shares traded divided by the number of outstanding shares. Market value is the market value of common equity. Firm size is the volume sale of the firm. Leverage is measured as the total debt divided by book value of assets.

Empirical Results

In this section, the relevant theoretical papers suggest the following hypothesis:
-There is a positive relation between voluntary information and bid-ask spread.

In order to appraise whether voluntary information improves, harms, or has no effect on bid-ask spread, the bid and ask spread is regressed on voluntary information and several control variables. The specification is defined as follows:
Bid-ask spread = α_0 + α_1 Voluntary Information + α_2 Volume + α_3 Number of Transaction + α_4 Market Value + α_5 Firm Size + α_6Leverage

Statistical Summery

The sample consists of 134 firm-year observations. Table 1 presents the definition and summary statistics of each variable we use in our study. The variables are defined and discussed below. The average bid-ask spread is 24.41, and Mean (median) voluntary information is 0.78 (0.8). The means and medians in Table 2 suggest that all variables closely follow a normal distribution.

TABLE 2: Summary of Descriptive Statistics

Variable	# of obs	Mean	Median	SD	25%	95%
Bid-ask spread	134	24.41	15.15	23.31	1.98	87.95
Voluntary Information	134	0.78	0.8	0.04	0.69	0.84
Market Value	134	26.37	26.19	1.48	24.02	30.24
Leverage	134	0.62	0.63	0.16	0.29	0.95
Firm Size	134	13.66	13.41	1.93	11.07	19.58
Volume	134	18.71	18.63	1.85	15.37	22.85
Number of transaction	134	27.67	7.56	65.43	189.52	270.6

The bid-ask spread (B A-S) is computed as the difference between bid prices, which the dealer is willing to pay for a security and the higher ask price at which the dealer is willing to sell the security. Voluntary information (VI) is the percentage voluntary disclosure score for each information category that build on Botosan (1997), Market value (MV) is the market value of common equity. Leverage (Lev) is measured as the total debt divided by book value of assets. Firm size (FS) represents the volume sale of the firm.. Volume (Vol) is measured the daily Rial volume average of all trading days for firm. Number of transactions (No of T) is the number of shares traded divided by the number of outstanding shares. This table presents the estimation results for the OLS model. Firm and Time (year) dummies are included in the regressions. P-value is reported in parentheses.

Correlation Matrix

A Spearman rank correlations among the voluntary information measures, bid-ask spread and all control variables is given in Table 3. Spearman correlations are reported below the diagonal. As shown in Table 3, voluntary information (VI) has significantly positive Spearman correlations with bid-ask spread. In other words, firms with high voluntary information tend to have lesser bid-ask spread. Overall, the correlations suggest that multicollinearity is of no concern, permitting the use of regression analysis.

TABLE 3: Correlation Matrix for Baseline Specification variables

	BA-S	V I	M V	Lev	F S	Vol	N0. T
BA-S							
V I	-0.21**						
M V	-0.25***	0.23***					
Lev	0.32***	0.03	-0.07				
F S	-0.02	0.01	0.65***	0.21**			
Vol	-0.25***	0.21**	0.76***	0.06	0.42***		
N0. T	-0.21**	0.11	0.59***	-0.03	0.38***	0.81***	

Pearson correlations are reported above the main diagonal and Spearman correlations are reported below the diagonal. (***) (**) (*) Indicates significance at (1%) (5%) (10%) two -tailed level. The descriptions for all of the variables listed above are given in the notes to Table 2

Regression Analysis

In this section we present the results of the ordinary least squares (OLS) regressions. Table 4 contains the OLS regression estimates of the model. We use an F-statistic to test for the null hypothesis that the variables together are unable to explain any variation in bid-ask spread. The F-statistic rejects the null at the 1% significance level in our OLS regression.

Our regression results indicate that the coefficient on the amount of voluntary information is (-9.81) with a negative sign. The adjusted R_2 is 14 percent in the model. And probability t-value of 0.001 indicates that it is significant in the regressions thus, a negative relationship as predicted, between voluntary information and bid-ask spread. This result is consistent with the findings in (Chen et al., 2007 and Brown, 2006 and Barbedo, 2010).

Our multiple regression results also show that volume has marginally significant negative coefficient in the sample (coefficient= -1.87, $p < 0.10$). Which is consistent with the findings of (Lee and Charles, 1993 and Chen et al., 2007). The coefficient on the firm size (coefficient= -

0.04, p < 0.00) is statistically insignificant in the pooled regressions. We find that leverage (coefficient= 3.88, p < 0.00) and market value (coefficient= 2.64, p < 0.00) are fairly significant and positively associated with bid-ask which is consistent with the findings of Stoll (2000); Chen *et al.* (2007). Number of transaction seems to have an insignificant effect on bid-ask spread. The coefficient on Number of transaction is about zero. This is the opposite of finding of Chen et al., 2007, which may be due to differences in the condition Iran economical, samples, or time periods.

TABLE 4: Regression analysis: voluntary information and bid-ask spread

	VI	F S	Lev	volume	MV	# of T	Adj. R^2	Prob > F
B A-S	-9.81*	-0.04	5.31***	-2.96*	1.67***	-0.01		
	(-1.78)	(-0.04)	(3.88)	(-1.88)	(2.64)	(-0.52)	0.14	0.001

The descriptions for all of the variables listed above are given in the notes to Table2. This table presents the estimation results for the OLS model. Firm dummies are included in the regressions. Standard errors are reported in parentheses. (***) (**) (*) Indicates significance at (1%) (5%) (10%) two -tailed level.

Discussion

Researchers in finance and accounting area pointed out theoretical supports for the negative association between voluntary information and bid-ask spread. They believe that for stocks with more private information and less public information, uninformed investors require a higher rate of return as compensation because more private information increases information asymmetry as well as the information risk uninformed investors face. It is reasonable to believe that when a high degree of information asymmetry is detected, market makers tend to increase the asymmetric information component of the spread as a reaction to increased risk due to information arrival. If market maker is aware of some information about stock, this would result in lowering the risk of market maker which can lead to a reduction in bid-ask spreads. Thus, firms can reduce the adverse selection component of the bid-ask spread of disclosing private information.

Conclusion

In this study, we examine the relation between voluntary information as measured by self-constructed using the disclosure index of Botosan (1997) and bid-ask spread in Tehran Stock Exchange. We show that spreads are lower for firms with the high level of voluntary information. We also find that firms with larger trading volume and greater market value had lower bid-ask spread, but results show that number of transaction does not have an impact on bid-ask spread. This is a positive finding for the policy makers that know the effect of voluntary information would result in lower bid-ask spreads for the purpose of building a fairly liquid stock market.

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