IJBFMR 8 (2020) 56-61 ISSN 2053-1842

International Journal of Business and Finance Management Research
www.bluepenjournals.org/ijbfmr

Post-trade impact: who wins and who loses?

doi.org/10.33500/
ijbfmr.2020.08.007

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Article History
Received 15 May, 2020
Received in revised form 12 June, 2020
Accepted 16 June, 2020

Keywords:
Effective spread, Realized spread, Informed traders, Uninformed traders.

Article Type:
Full Length Research Article

ABSTRACT

This study investigated the impact of an increased post-trade transparency event on the Taiwan Stock Exchange (TSEC). The empirical results obtained indicate that, after the event, there is an ambiguous change in the effective spread (ES), with a significant decrease in information asymmetry (IA) and significant increase in the realized spread (RS). The outcomes imply that the event has little impact on trading cost, market liquidity and efficiency, decreasing the profit of informed traders and increasing the profit of uninformed traders, that is, complete transference of profit between them. It is possible that the event helps uninformed traders avoid being adversely selected and promotes fairness.

INTRODUCTION

The issue of transparency appears in arguments about market design and regulation. It is believed that transparency determines the quantity of information available for the participants in the trading process. Changes in transparency alter the information observable to participants, which impacts the traders' behavior and, in turn, determines market performance. In this study, the post-trade transparency event was used, which impacted the Taiwan Stock Exchange (TSEC), and examine the impact on the effective spread (ES) and its two components, that is realized spread (RS) and information asymmetry (IA). The ES implies trading costs and is correlated with market liquidity and efficiency. The RS concerns the profit to uninformed traders in the trading process. IA impacts stock market fairness and is related to the profit of informed traders[1]. All of these are important indicators of stock market performance.

Traditionally, the concept of transparency is divided into two categories: pre- and post-trade transparency. Pre-trade transparency relates to the opening of limit order books before a trade. Post-trade transparency relates to the disclosure of timely trading information which is publicly disseminated to participants after a trade. This paper examines the impact of post-trade transparency on the TSEC. Beginning on January 2, 2003, after each trade, the TSEC started disclosing the best five bid-ask prices with orders from the unexecuted order books. Before that day, the TSEC disclosed only the best bid/ask price with orders.

This study is related to the body of post-trade transparency literature. In their examination of the London Stock Exchange (LSE), Gemmill (1996) and Board and Sutcliffe (2000) found that changes in the speed of trade reporting have little effect on market characteristics. Chien (2013) found that increased transparency enhances the price efficiency of the stock closing call. Tang (2014) showed that transparency may be either helpful or harmful to market efficiency, depending on the sensitivity of investors' private-information to trade disclosure. Naik et al. (1999) used an experiment method to show that the full and timely disclosure of trading may reduce the welfare of market participants. Bloomfield and O'Hara (1999) argued that trade disclosure benefits dealers at the expense of informed traders and liquidity traders. Frutos and Manzano (2005) argued that the impact of trade disclosure on welfare was unclear. Baruch (2005) modeled and found

[1]See Huang and Stoll (1996) and Gibson et al. (2003)

that an open limit order book decreases transitory cost and increases adverse selection problem because it enhances the competition among liquidity suppliers and encourages informed traders to trade more aggressively. Lewis and Schwert (2018) examined the impacts of post-trade transparency of bond market on the profit allocation among market participants. They showed that trade disclosure causes the profit of the dealer to be lower. Bessembinder et al. (2006), Goldstein and Edith (2007), Edwards et al. (2007), and Schultz and Song (2019) among others also studied the impact of post-trade transparency events on the bond market. They found that the event decreases traders' potential profits, which come from informed trading. Bessembinder and Maxwell (2008) provided an explanation for this result, showing that it is more difficult for informed traders to exploit uninformed traders under transparent conditions.

In summary, these studies do not offer consistent conclusions on the impact of post-trade transparency on the profit of market participants. Most of the stocks focused upon in the existing literature have dealers or specialists, who adjust themselves to changes in transparency, but the TSEC is a purely order-driven market. Furthermore, studies examining the effect of post-trade transparency on profit between informed and uninformed traders are lacking. How the changes in profit caused by the post-trade transparency are distributed between informed and uninformed traders is still not known. This study is an effort to fill the gap in the existing literature by comparing the two components of ES before and after the TSEC event. Based on these arguments, the following hypotheses were arrived at:

H_1. The post-trade transparency event has no impact on the ES.

H_2. The post-trade transparency event has no impact on the RS.

H_3. The post-trade transparency event has no impact on the IA.

Although the post-trade transparency event affecting the TSEC several years ago, it is still valuable to study for the following reasons: (1) in reality, post-trade transparency events are very few, and the TSEC experience affords a reference for other exchanges around the world and information about it would enrich existing studies; (2) since the 2008 financial crisis, there has been no agreement as to whether transparency is better than opacity, and the results of this study will shed light on this argument; (3) the TSEC post-trade transparency event brings all stocks into focus, allowing us to examine its impact on the same stocks in the same market; (4) finally, the issue of profit distribution between informed and uninformed traders before and after the event has not been discussed in the literature.

This study finds that, after the event, there is no significant change in the ES, but the problem of IA decreases significantly and there is a significant increase in RS. Furthermore, the decrease in IA is completely transferred to the RS. That is, the decrease in profit of informed traders is perfectly transmitted to the uninformed traders. The implications of these results are two-fold. First, the event does not affect trading cost and is not conducive to market liquidity and efficiency. Second, the event changes the distribution of profit between informed and uninformed traders during the trading process so is beneficial to market fairness. This is also consistent with the viewpoint of Bessembinder and Maxwell (2008) who argued that it is more difficult for informed traders to exploit uninformed traders under conditions of transparency.

The TSEC and data source

The TSEC is a pure, order-driven market with no market makers. On January 2, 2003, the TSEC began disclosing additional information after each trade, namely the best four bid/ask prices with orders from the unexecuted limit order books.

The additional information disclosure comprises a post-trade transparency event. All intra- and daily- data used in this study are obtained from the Taiwan Economic Journal (TEJ) data base. The statistical methodology of simple random sampling is used to select 200 firms from the firms listed on the TSEC. The selected 200 firms make up the sample of this study. Also, some filters are used to delete unreasonable intra-data. The estimation period before the event is from January 1, 2002 to December 31, 2002; the event period after the event is from January 1, 2003 to December 31.

METHODOLOGY

Huang and Stoll (1996) decomposed the ES into two components, the RS and IA. They showed that the RS is the payoff to uninformed traders, and the IA is the payoff to informed traders. Furthermore, Gibson et al. (2003) argued that the RS and IA are short-term measures of the potential profit or loss to uninformed traders and informed traders, respectively. The ES, RS, and IA are defined as follows:

$$ES_{it} = q_{it}.\frac{(p_{it} - m_{it})}{m_{it}} \quad (1)$$

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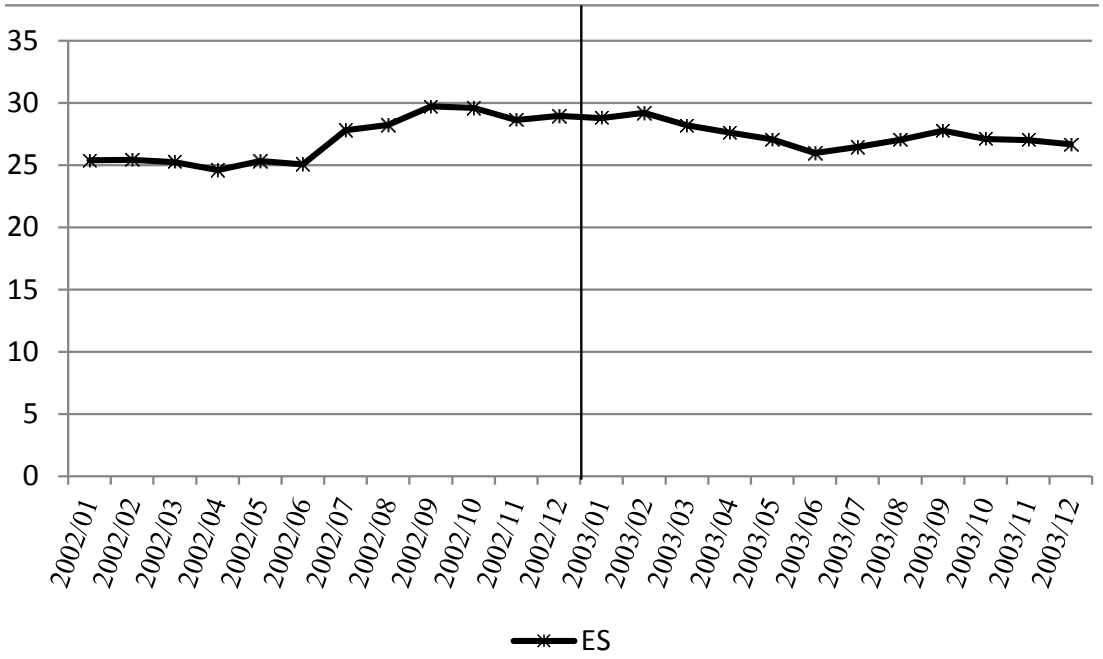

Figure 1. The pattern of the ES before and after the event. The ES is defined in Equation 1. Before the event is the period from January 1, 2002 to December 31, 2002; after the event is from January 1, 2003 to December 31. The ES is the arithmetic average of intraday observations within firms, then averaged across firms. The number is collected and computed each month.

$$RS_{it} = q_{it}.\frac{(p_{it} - m_{i,t+5m})}{m_{it}} \quad (2)$$

$$IA_{it} = q_{it}.\frac{(m_{i,t+5m} - m_{i,t})}{m_{i,t}} \quad (3)$$

For stock i at time t, q_{it} is an indicator variable with a value of +1 if a trade is buyer-initiated (p_{it}>m_{it}) it has a value of -1 if a trade is seller-initiated (p_{it}<m_{it}); its value is 0 if p_{it} is equal to m_{it}; m_{it} is the middle point between the bid-ask prices; $m_{i,t+5}$ is the midpoint price 5 minutes after a trade; and p_{it} is the transaction price.

The methodology of Hendershott et al. (2011) is applied to proceed with the robust test for the ES and its two components:

$$L_{it} = \alpha_{it} + \beta_i Dummy_{it} + \sum_{k=1}^{4} \varphi_k \, Controls_{i,t,k} + \varepsilon_{i,t} \quad (4)$$

For stock i at time t, L_{it} is the ES with its two components, RS and IA; $Dummy_{it}$ is a dummy variable, with a value of 1 after the event; otherwise 0; $Controls_{i,t,k}$ are the control variables including: ln(ap), ap is the average trading price for stock i at day t; volatility, which is the difference between the highest price and lowest price for stock i at day t; ln(v), which is defined as the natural log of the market value for stock i at day t; turnover rate is defined as the turnover rate for stock i at each day.

EMPIRICAL RESULTS

An examination of Figures 1-3 shows no obvious change in the path of the ES after the event. The path of the RS is in the upper position and the path of IA decreases gradually.

Further step was taken to test their differences around the event. The results of difference testing are shown in Table 1, and the results of robustness testing are shown in Table 2. Taken altogether, the results in Tables 1 and 2 are consistent. From Table 1, it can be seen that, after the event, there is no obvious change in the ES, but there is a significant increase in the RS and significant decrease in the IA. The gain of uninformed traders (+0.468 bps) is translated from the loss profit of informed traders (-0.369bps) and from a small increase (0.114 bps) in the ES.

A panel data methodology was used for model (4) for robust testing. Only the coefficient of the dummy variable is reported in Table 2. In column (1) of Table 2, only the dummy variable and fixed effect are considered. In column (2) of Table 2, the dummy variable, the controlled variables and fixed effect are considered simultaneously. Taken at face value, the results in Table 2 indicate that the change

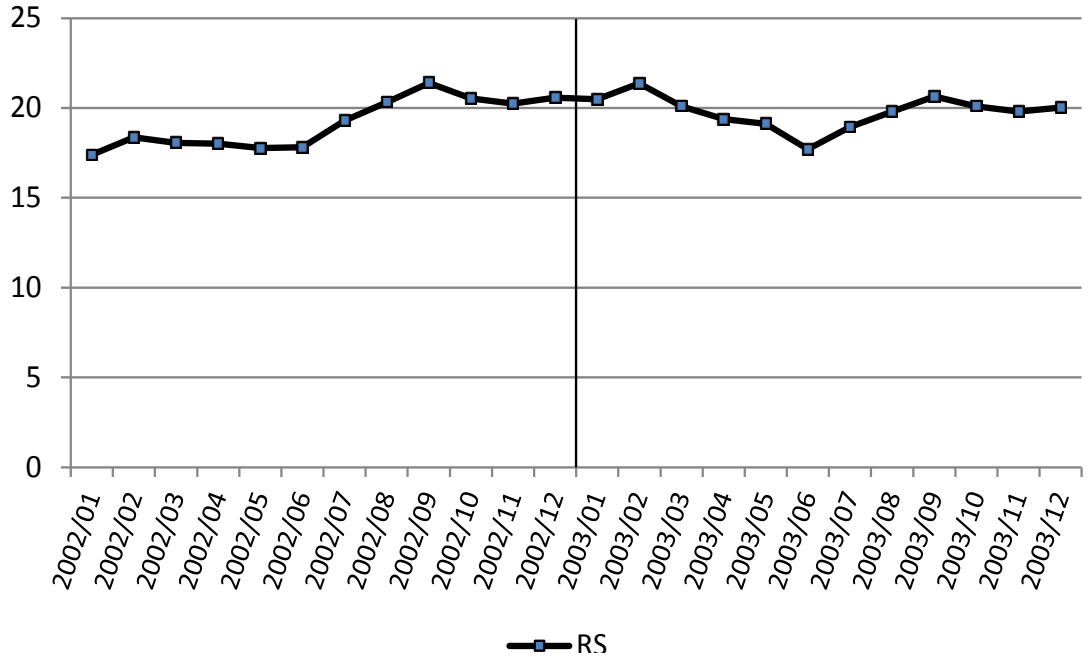

Figure 2. The pattern of the RS before and after the event. The RS is defined in Equation 2. Before the event is the period from January 1, 2002 to December 31, 2002; after the event is from January 1, 2003 to December 31. The RS is the arithmetic average of intraday observations within firms, then averaged across firms. The number is collected and computed each month.

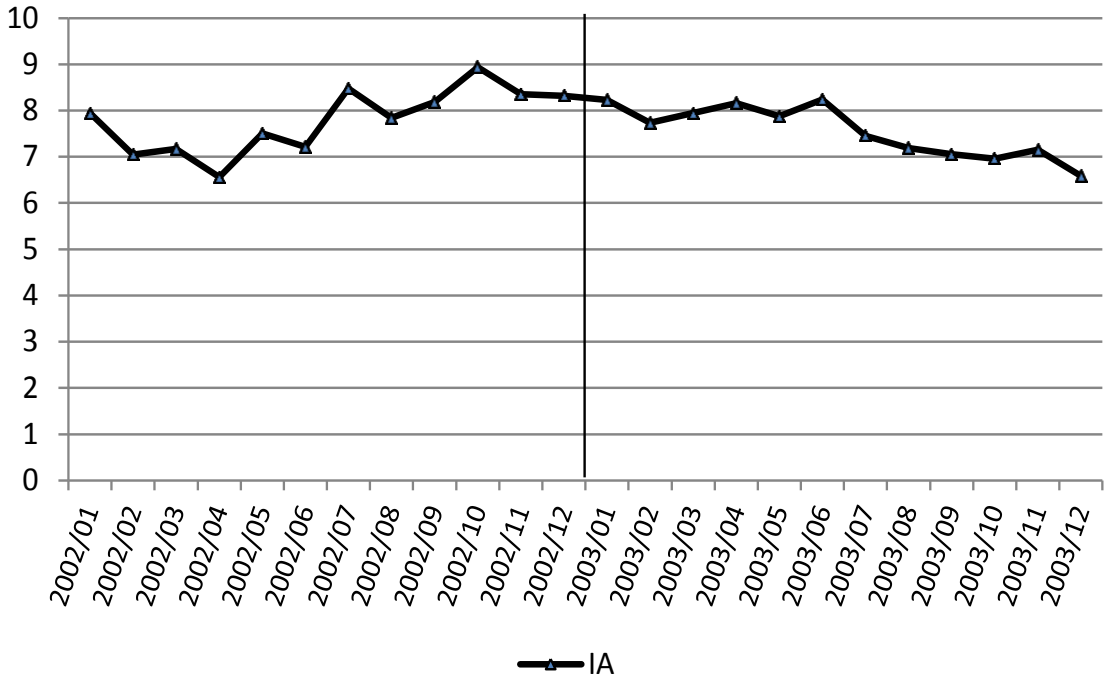

Figure 3. The pattern of the IA before and after the event. The IA is defined in equation (3). Before the event is the period from January 1, 2002 to December 31, 2002; after the event is from January 1, 2003 to December 31. The IA is the arithmetic average of intraday observations within firms, then averaged across firms. The number is collected and computed each month.

Table 1. ES, RS and IA before and after the event. The numbers in columns (1) and (2) are the means before and after the event, respectively. The ES, RS, and IA are defined in Equations 1, 2 and 3. Before the event is from January 1, 2002 to December 31, 2002; after the event is from January 1, 2003 to December 31. The values in column (3) indicate the differences between before and after the event and the Wilcoxon sign rank test is used to compare them; the corresponding p values are given in parentheses. Here, *, ** and *** indicate significance at the 10, 5 and 1% levels, respectively.

Variables	Before event (1)	After event (2)	Diff. (3)
ES	27.312	27.426	0.114 (0.153)
RS	19.394	19.862	0.468*** (<0.001)
IA	7.867	7.498	-0.369*** (< 0.001)

Table 2. Robustness testing. The results of robustness testing for changes in the ES with its two components around the event are shown in this table. The regression model is defined in Equation 4. Only the coefficient of the dummy variable is shown. Column (1) shows the regression results with only the fixed effect considered. Column (2) shows the regression results with the fixed effect and control variables considered simultaneously. The numbers in parentheses are the corresponding t-values. *, ** and *** indicate significance at the 10, 5 and 1% levels, respectively.

Variables	Fixed effect only (1)	Control variables + Fixed effect (2)
ES	0.23*** (3.26)	0.11 (1.52)
IA	-0.34*** (-7.60)	-0.14*** (-2.63)
RS	0.56*** (7.61)	0.21*** (2.63)

in directions of the ES, IA, and RS are consistent with those in Table 1. The coefficients of IA are less than the coefficients of RS (-0.34 vs 0.56; -0.14 vs 0.21) and the direction is opposite. Those outcomes mean that the loss of profit of informed traders has been completely transferred to the uninformed traders. In summary, based on the empirical results, H_1 cannot be rejected, while H_2 and H_3 are rejected.

All in all, these results have the following implications: (1) the impact of the event on trading cost, liquidity and efficiency is ambiguous; (2) the event clearly has an impact on the competition between informed traders and uninformed traders; (3) the event ensures that uninformed traders are able to avoid being adversely selected, leading to a fall in profit for informed traders and an increase in profit for uninformed traders. In other words, the event has a redistribution function of profit allocation during the trading process. This loss of profit by informed traders is similar to the argument advanced by Bessembinder and Maxwell (2008), who pointed out that it is more difficult for informed traders to exploit uninformed traders under post-trade transparency; (4) the decreased profit of informed traders will discourage them from gathering/producing information. This is a side effect of the post-trade transparency.

Conclusion

This paper studies the impact of post-trade transparency in the TSEC on the ES with its two components. The findings of this study indicate that, after the event, the change in the ES is unclear while IA decreases significantly and the RS increases significantly.

The results imply that the event had little impact on trading cost, liquidity and market efficiency, while it was disadvantageous to informed traders and beneficial to uninformed traders. In other words, post-trade transparency mitigates the adverse selection problem between uninformed traders and informed traders, leading to a redistribution of profit during the trading process, creating fairer stock markets and having a side effect of discouraging informed traders from participating in market and gathering information.

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