

**THE INTERPRETATION OF ACCOUNTING INFORMATION BY FOREIGN
INVESTORS:
DO WE REALLY NEED INTERNATIONAL ACCOUNTING HARMONIZATION?**

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ABSTRACT: This paper examines how investors interpret accounting information generated by foreign GAAP. Of particular interest is the effect of earnings release by U.S. firms on their stock prices in the Tokyo Stock Exchange (TSE). By comparing the prevailing stock prices in Tokyo with the prices in the United States (NYSE and NASDAQ) on the subsequent trading, this paper shows that investors in TSE priced these securities in a different manner than U.S. investors *only* when investors in TSE had no chance of observing 'home pricing' after the earnings release because of late (i.e., after market close) earnings announcement. The pricing difference between TSE and NYSE/NASDAQ was significantly larger than that of other days. In contrast, the pricing was quite similar between the days after early earnings announcement and the days when no announcements were made. Several diagnostic tests were performed and they did not alter the results.

This finding is important because it offers the first empirical evidence that investors (Japanese, in this case) may not be sophisticated enough to interpret accounting information based on foreign GAAP as skillfully as investors of its home country (U.S.). The finding provides a necessary condition for pursuing international accounting harmonization, as it is shown that at least some investors are at a disadvantage in interpreting accounting information prepared under foreign GAAP. The effort of International Accounting Standards Committee is warranted in a sense that IAS is expected to provide level playing ground for international investors.

I. Introduction

This study examines the interpretation of accounting information in a global setting. Of particular interest is whether foreign investors interpret earnings releases and revise their assessment of firm value, as reflected in stock price, in the same fashion as domestic investors. By using the stock transaction data in the U.S. and Tokyo¹, I will test whether investors in Tokyo (foreign investors) priced U.S. stocks in the same manner as investors in the U.S. (domestic investors) after the earnings release. The prevailing stock *prices* rather than their *returns* following the information release will be compared between the two markets.

The accounting profession has long advocated international comparability of financial statements. The International Accounting Standards Committee (hereafter IASC), founded in 1973, has long been working on establishing International Accounting Standards to provide internationally accepted accounting standards. According to the IASC,

Investors in international markets need to be sure that the information on which they base their assessment is compiled using accounting principles recognised in their own country and comparable with others regardless of the country of origin. (IASC 1983, paragraph 3, emphasis added.)

A similar view was taken by Speidell and Bavishi (1992) who argued that the different GAAPs prevent investors from measuring firms' worth accurately.

The above statement explicitly states that investors in international markets benefit from the international harmonization of accounting standards. The IASC is assuming that international investors cannot interpret accounting information based on foreign GAAP and suffer from that deficiency. However, this assumption appears to have never been empirically tested. This study tests whether the above assertion is warranted by the seeming mispricing of cross-listed securities in foreign markets. Assuming that domestic investors can price securities properly, if I find that foreign investors do not react (i.e., price securities) to the accounting information in the same manner as domestic investors, I can accept the IASC's assertion, because the difference in pricing between markets may be resolved by using the International Accounting

Standards, thus benefiting international investors. In other words, the difference in pricing is a necessary condition for the effort by IASC. If the pricing is the same regardless of the accounting standards used, there may not be any benefit in harmonizing accounting standards.

Alternatively, after receiving new accounting information, foreign investors may price securities in the same manner as domestic investors. If this is the case, I may have to wonder whether the International Accounting Standards are of any practical value to investors, because there may not exist any marginal improvement for investors' capability of interpreting foreign firms' operations by using international standards².

This study is important for the accounting literature because, 1) the findings of this study provide the first empirical evidence to directly assess the efficacy of international accounting harmonization, and 2) the study is the first to directly test the usefulness of accounting information in a global setting.

The major finding of this study is that foreign investors appear to form price in a different manner from that of domestic investors. Although further refinement of this study is warranted, the findings support the assertion of IASC and provide an evidence that the necessary condition for their effort is met. Methodologically, this study shows that timing of an event is very important in conducting an event study in an international context. Whether an event occurred during the trading time or not is shown to possibly have a significant impact on inferences from an event study.

The rest of this paper is organized as follows. Section II presents relevant literature. Section III develops the hypotheses tested. Section IV discusses the data and research methodologies used. Section V provides the empirical result and Section VI checks the robustness of the findings. Section VII concludes this paper.

II. Relevant Literature

Accounting information, including earnings, has long been shown to be informative and that it affects investors' expectation of firms' values in both U.S. and Japanese markets. Beaver

(1968) and Morse (1981) report such findings in the U.S. and Sakurai and Gotoh (1985) reports similar findings in Tokyo. Analytical explanations of these observations, based on the assumption of information asymmetry, were recently provided by Demski and Feltham (1994) and McNichols and Trueman (1994).

However, very few accounting studies directly deal with the international information transfer on individual cross-listed securities. I am aware of only three studies, ones by Meek (1983), Frost and Pownall (1996), and Etter (1997)³.

Meek (1983) examined how the U.S. market reacted to the earnings releases of the non-U.S. firms announced in the U.S., which were typically based on non-U.S. GAAP. By examining abnormal returns around the event, he claimed that the U.S. market reacted to the U.S. earnings releases by non-U.S. firms in the same manner as it did to U.S. firms. However, his finding did not exclude the possibility that the U.S. market reacted to the home earnings release and the home market's response to it, instead of the U.S. earnings release because about four-fifth of his sample firms made home earnings releases on the same day as the U.S. release (p. 397). Because of the time difference, the home earnings release usually precedes the U.S. release as long as they are made on the same date. This is a critical issue if I want to test how foreign investors react to foreign GAAP based information, because foreign investors may learn by observing the reaction by domestic investors. Moreover, as the trading times of Europe and the U.S. overlap, the U.S. market should be regarded as a quasi-satellite market for European stocks. Thus, the stock price behavior in the U.S. cannot necessarily be interpreted as mispricing by U.S. investors because of a dynamic feature of satellite markets (Garbade and Silber 1979).

The present study overcomes these two problems by using the trading data of U.S. stocks listed in Tokyo, because I can restrict foreign (Tokyo) investors to interpret the information before domestic (U.S.) investors do and there is no trading time overlap between the two markets.

On the other hand, Frost and Pownall (1996) conducted a case study on an ADR (American Depositary Receipt) of Smithkline Beecham, a U.K. pharmacy firm. They found that,

after the earnings release based on U.K. GAAP, the behavior of the return on the ADR in the U.S. was significantly different from the return on the underlying stock in the U.K. They attributed their somewhat anomalous finding to non-accounting factors such as taxation and market liquidity. However, inference from their study was limited due to the nature of case study. In addition, the same timing issue as discussed above is applicable to their study.

Etter (1997) treated the U.S. market as foreign, like the above two studies. However, he shares the concern on the effect of home market reactions to earnings release on foreign market with this study. He employed VAR model to separate out the effect of the abnormal return for aggregated return on the U.S. market. He concluded that U.S. investors found information content in Japanese (and U.K.) earnings announcements. It is not clear, however, whether U.S. investors priced the securities in the same manner as the home (Japanese and U.K.) investors.

Current study contributes to the literature in two ways. First, by using the data in Tokyo Stock Exchange (hereafter TSE) and using late earnings announcements as events, I eliminated the effect of home market trading. This design allows maximum control over the quasi-experiment. Second, by using stock prices rather than stock returns, I reduced the measurement error problem that is inevitable with return studies. Because of these, the results provide clear evidence that pricing of U.S. stocks in Japan is different from that in the U.S. This finding is a supporting evidence that international accounting harmonization is potentially beneficial to international investors.

III. Hypothesis

First, I must emphasize that the security price, not the return, is the focus of this study. This is a departure from most, if not all, of existing accounting and finance literatures. The reason for the departure is that I am not aware of any asset pricing theory that deals with multiple markets where identical securities are traded nonsynchronously and denominated in different currencies⁴. Therefore, I cannot use security returns in this study as there is no benchmark for calculating 'normal' return. This lack of theory is very often overlooked in the existing finance

literature that looks for the correlation between returns in different markets. Instead, I will depend on a very naive assumption, which is 'globally conditional homogeneous beliefs.'⁵ This is a standard assumption employed in asset pricing theory in finance, including CAPM and APT. Under this assumption, investors in different markets must price securities homogeneously if they share the same information set.⁶ This assumption allows us to use security prices to test the hypotheses discussed below.

If investors are (not) sophisticated enough to be able to interpret accounting information based on foreign GAAP, the prices of the cross-listed securities at the foreign exchange will (not) be determined in the same manner as in the domestic exchange. Therefore, after adjusting for the fluctuation of the foreign exchange rates, the prevailing security prices in the foreign market after the earnings release will (not) be the same as the prevailing prices in the domestic market. The following null hypothesis will be tested.

H1: The pricing of the cross-listed securities in the foreign market is the same as the prices in the domestic market, immediately following an earnings release.

Insert Figure 1 here.

To test the above hypothesis, I use the stock prices of the U.S. firms cross-listed in TSE. Because of the time difference between the U.S. and Japan (see Figure 1), the news released after the close of the U.S. market is first used by the investors in Tokyo⁷. The investors in the U.S. have to wait until the next morning to use the information released after the U.S. market closes. Therefore, transactions in TSE are free from the learning from the U.S. trading on the same information release. This is an important departure from past studies that used the U.S. market as a foreign market.

IV. Research Method

Data

The securities to be tested are all stocks of listed U.S. firms cross-listed in the Foreign Section of Tokyo Stock Exchange at any point between 1985 and 1993. Seventy-seven firms were identified. The stock price data were obtained from CRSP for the U.S. market and *Nihon Keizai Shimbun* (Nikkei Newspaper) for TSE, respectively. To be included in the study, firms must have price data from both exchanges on the same date. It should be noted that, for a given firm, TSE price data are not available for all trading days because there are days when no transaction occurred⁸.

The exchange rates are closing rates (Telegram Transfer Mean, T.T.M.) in Tokyo, collected from *Asahi Shimbun*. I also used the exchange rates (T.T.M.) in New York at noon, provided by Federal Reserve Bank of New York to check the sensitivity of the test result to different exchange rates⁹. The tested events are quarterly earnings announcements by the firms.

The trading dates are divided into three subsamples. The first contains the earnings announcement dates when the announcements are made on or after 4:00pm in New York (hereafter late announcements) and the second contains the earnings announcement dates when the announcements are made before 4:00pm in N.Y. (hereafter early announcements). The former is the main interest of this study while the latter group serves as a control group in this study, as this is the case where Tokyo investors can learn market reaction to the news from the preceding trading activities in New York. The third sample contains all other trading dates without earnings announcement and grouped as no announcement dates. The earnings announcement dates and their timing were determined by the *Broad Tape*, retrieved from *Dow Jones News Retrieval*.

Statistical Tests

I conducted a resampling test to obtain a more robust statistical inference. I employed the bootstrap method described in Efron (1982)¹⁰. The use of resampling is appropriate in this study because the underlying distribution of variable is unknown. I computed the difference between the Tokyo price (converted to U.S. dollars) and the U.S. price, in terms of dollar value and

deflated by the U.S. price. I then tested whether the differences on the day after a late announcement are distributed in the same manner as the difference at other dates. Both the mean error and mean standard deviation of the error were compared across the three subsamples. The mean error measures Tokyo market's bias to U.S. pricing, whereas the mean standard deviation measures how much Tokyo market was 'off the mark' from the U.S. market. The mean standard deviation is the main focus of this study, as it measures difficulty Tokyo investors are facing in valuing U.S. GAAP based earnings announcement. Large standard deviation is interpreted as the evidence that investors had difficulty in pricing securities.

V. Empirical Results

Table 1 and Figure 2 show the result of resampling on pricing difference.

Insert Table 1 and Figure 2 here.

Resampling was done by using raw dollar value difference and variance deflated by U.S. stock price. From each data group, observations were randomly drawn with replacement. The sample standard deviation was calculated for the bootstrap sample. This procedure was repeated 1,000 times.

In Panel A, the magnitude of pricing error after late announcement is larger than other dates and it is negative. However, as one can see in Figure 2, the difference is not statistically significant. Therefore, one cannot construct a profitable arbitrage trading strategy based solely on late announcement. The variable of main interest is the standard error of the price difference reported in Panel B.

Insert Figure 3 here.

As seen in Panel B, the standard error of the price difference after late announcement is significantly larger than that of early/no announcement. It is also evident in Figure 3. Pricing

behavior after early announcement and that of after non-announcement are similar. However, the standard deviation of 'early' group is slightly larger than that of 'none' group. This is consistent with the finding that security price fluctuates on the following day of the earnings release (Patell and Wolfson 1984). The result shows that, inconsistent with the null hypothesis, foreign investors had differently priced securities from domestic investors did after the earnings announcement without observing the pricing by domestic investors, who are assumed to be as skillful as anyone in the market.

VI. Sensitivity Checks

The interpretation of results obtained above is dependent upon the assumption that late earnings announcement is the only treatment (i.e., everything else was controlled) in this quasi-experiment. The following tests were conducted to eliminate some possible causes that may explain the above findings.

Pricing around Late Announcement

If the pricing of securities *before* late announcement is different from others, then I should conclude that the mispricing was due to other reasons than interpretation of the earnings releases. For example, firms that announce their earnings announcement may, for some reason, be the firms whose accounting information is difficult for foreign investors to interpret. To test this hypothesis, I tested whether pricing errors are differently distributed on the day immediately prior to late earnings releases¹¹.

 Insert Table 3 here.

The result, however, does not show much difference between 'late' group and 'none' group¹². As seen in Table 3, both mean pricing error and its standard deviation are very similar among 'late' group and 'none' group.

Similar arguments to the above can be made if late announcement changes security pricing afterwards. For example, having no earnings announcement during the day when announcement was expected may be perceived as a bad news by investors (Damodaran 1987) and it may change subsequent pricing behavior. To test this, I examined how the securities were priced two days after late announcements.

Insert Table 4 here.

The results were somewhat surprising. As seen in Table 4, the pricing error on late announcement has smaller standard deviation compared to other two groups. A possible explanation is that Japanese investors, having trouble in interpreting late announcement, looked following U.S. pricing closer than usual and thus resulted smaller pricing errors on the next day. Although this finding is not inconsistent with prior findings, further examination on this issue is warranted.

'Good' News and 'Bad' News

Patell and Wolfson (1982) found that 'bad' news tends to be announced later in the day. Therefore, if 'bad' news confuses foreign investors more, then late announcement will result in larger deviation of pricing errors. Although the 'late' group contains some firms that consistently announced their earnings after market close for several years, the news content still may be the driving force of the reported result in Section 6. Following Patell and Wolfson, I divided late announcement group into two subgroups, based on whether the reported quarterly earnings were increase or decrease from the corresponding quarter of the previous year. This approach assumes a very naive earnings forecast model, that is,

$$E_t = E_{t-4} \tag{1}$$

where E denotes quarterly earnings and t denotes quarters.

Insert Table 5 here.

The result shown in Table 5 does not support the hypothesis that either 'good' or 'bad' news was a driving force of the results in Section V. Both 'good' and 'bad' subgroups have significantly larger standard deviations of pricing errors than that of 'none' group. Thus I conclude that neither 'good' nor 'bad' news was a cause of my findings.

VII. Discussion and Conclusion

I performed bootstrap analysis to detect possible different investors' pricing behavior at late earnings announcement. It rejected the null hypothesis, meaning there exists difference of the pricing of securities between the late earnings announcement days and other days. Especially, the pricing is 'off the mark' when foreign investors cannot observe the pricing by domestic investors. This finding suggests that foreign investors are interpreting accounting information in a different manner than domestic investors, thus supports the IASC's assertion that international investors are the beneficiary of international accounting harmonization. The findings satisfy a necessary condition to support the effort by IASC. From a methodological standpoint, the finding in this study suggests that the timing of (earnings) announcement is critical in performing a study related to international information transfer, an interesting research topic which is drawing attention by accounting and finance researchers.

The above finding was robust across two different foreign exchange rates. The measure of pricing error did not alter the result, either. Examination of pricing around late announcements generally supported different pricing behavior on late announcements by foreign investors. Comparison of 'good' and 'bad' news failed to explain the different reactions by them, either.

Ideally, similar tests to the ones done in this study that use different combination of markets should be done to strengthen my findings. However, to the best of my knowledge, late earnings announcement is a unique feature of the U.S. market. Another way to strengthen this

study would be a comparison of pricing after late U.S. announcement in Asian markets other than Tokyo. Unfortunately, this test is not feasible as there are not many U.S. firms listed in other Asian markets.

It is possible to refine and extend this study in several ways. First, the influence of European markets (e.g., London), was not explored in this study. It will be fruitful to examine continuous pricing process across markets. The problem with this research avenue is that there exists no theory that can explain asset pricing procedure in the simultaneous *and* multiple market setting. Also, usage of NY opening/intraday price rather than close price will eliminate the effect of new information released during the day following late announcement. Second, analytical work that explains asset pricing in a global context is eagerly wanted. Existing studies are very limited in explaining the institutional phenomenon, which may have caused the underpricing in Tokyo found in this study.

Endnotes

- ¹ I will contrast the words 'U.S.' and 'Tokyo' because the sample firms in this study are listed on either NYSE or NASDAQ in the U.S. while all of them are listed on the Tokyo Stock Exchange in Japan.
- ² Even if this is the case, IAS may be still of interest for other parties such as regulators and accounting profession.
- ³ It is interesting to note that empirical finance literature has not dealt with individual securities in an international context. Most of them deal with market indices, instead.
- ⁴ There exist theoretical models that incorporate some of these concerns. For example, Garbade and Silber (1979) deals with satellite markets (with synchronous trading), while Solnik (1983) and Ikeda (1991) offer international asset pricing models with foreign exchange rate fluctuation risk.
- ⁵ Formally, this assumption can be stated as follows (Jarrow 1988).

Given a traded asset $x \in M$, every investor agrees that $x(\omega)$ is the time 1 dollar cash flow to asset x , given state ω occurs.
- ⁶ I assume no 'new' information release in NY on the following day of the earnings announcement. This is the same assumptions made in the event study literature that employs multiple days (e.g., three days) window. News such as analysts' recommendation revision based on the earnings announcement are not considered as 'new' in this study, as such information is a part of the decision making process of the market as a whole on the earnings announcement. Also see Greene and Watts (1995).
- ⁷ Although TSE requires foreign firms to promptly disclose information after announcements are made in their home country, (some firms do not comply prompt disclosure rule), it does not require foreign listed firms to disclose financial information according to Japanese GAAP. Reconciliation to Japanese GAAP is not required, either. Firms are required to translate the financial statements into Japanese. Thus, Japanese investors do not receive Japanese GAAP-based financial information of U.S. firms at all.
- ⁸ There is no market maker (e.g., specialists) in TSE. Therefore, an actual transaction between investors is required to obtain a prevailing price.
- ⁹ The correlation between two exchange rates was .9998 for the sample years.
- ¹⁰ Marais (1984) offers a concise description of bootstrap and an example of its application to accounting research.
- ¹¹ The sample 'late' observations used in this subsection are *not* identical to the observations reported in Section 6, as some firms do not have stock price available for the day prior

to/following the earnings announcement. However, using firms whose data was available for three consecutive days around late announcement (75 announcements), the results were virtually the same as the ones reported here.

- ¹² It is reasonable that 'early' group is now different from others. Because of the timing difference, New York price reflects earnings announcement made on the day whereas Tokyo price does not.

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Table 1**Means and Standard Errors in the Difference of Pricing between U.S. and Tokyo
After Earnings Announcements**

Panel A

Price Difference (Tokyo Price - U.S. Price)

1. Exchange Rate = Tokyo

Announcement Type	Mean (Dollar amount) (s.e.)	Mean (Deflated by price) (s.e.)

Late	-.4794 (.2017)	-.0080 (.0036)
Early	-.1745 (.0370)	-.0031 (.0008)
None	-.1472 (.0038)	-.0027 (.0001)

2. Exchange Rate = NYC

Announcement Type	Mean (Dollar amount) (s.e.)	Mean (Deflated by price) (s.e.)

Late	-.4845 (.2066)	-.0084 (.0037)
Early	-.1692 (.0395)	-.0030 (.0008)
None	-.1567 (.0039)	-.0029 (.0001)

Table 1 (cont.)

Panel B

Standard Error of Price Difference

1. Exchange Rate = Tokyo

Announcement Type	S.E. (Dollar amount) (s.e.)	S.E. (Deflated by price) (s.e.)
Late	2.0412 (.2487)	.0376 (.0037)
Early	1.2325 (.0542)	.0262 (.0011)
None	1.0817 (.0191)	.0231 (.0003)

2. Exchange Rate = NYC

Announcement Type	S.E. (Dollar amount) (s.e.)	S.E. (Deflated by price) (s.e.)
Late	2.0847 (.2595)	.0381 (.0037)
Early	1.3088 (.0584)	.0269 (.0011)
None	1.1170 (.0185)	.0236 (.0003)

Table 2**Means and Standard Errors in the Difference of Pricing between U.S. and Tokyo Days Prior to Earnings Announcements**

Price Difference (Tokyo Price - U.S. Price)

Exchange Rate = Tokyo*

Announcement Type	Mean (Dollar amount) (s.e.)	Mean (Deflated by price) (s.e.)
Late	-.2614 (.1305)	-.0054 (.0028)
Early	-.1812 (.0467)	-.0024 (.0010)
None	-.1463 (.0042)	-.0027 (.0001)

Standard Error of Price Difference

Exchange Rate = Tokyo*

Announcement Type	S.E. (Dollar amount) (s.e.)	S.E. (Deflated by price) (s.e.)
Late	1.2585 (.1342)	.0265 (.0026)
Early	1.6017 (.0869)	.0339 (.0032)
None	1.0715 (.0185)	.0229 (.0003)

* Using New York exchange rate provides very similar results and thus are not reported.

Table 3**Means and Standard Errors in the Difference of Pricing between U.S. and Tokyo Days Following Earnings Announcements**

Price Difference (Tokyo Price - U.S. Price)

Exchange Rate = Tokyo*

Announcement Type	Mean (Dollar amount) (s.e.)	Mean (Deflated by price) (s.e.)
Late	-.1325 (.0921)	-.0012 (.0018)
Early	-.0831 (.0357)	-.0014 (.0007)
None	-.1483 (.0039)	-.0027 (.0001)

Standard Error of Price Difference

Exchange Rate = Tokyo*

Announcement Type	S.E. (Dollar amount) (s.e.)	S.E. (Deflated by price) (s.e.)
Late	.9074 (.0960)	.0174 (.0011)
Early	1.2174 (.1156)	.0247 (.0016)
None	1.0790 (.0196)	.0230 (.0004)

* Using New York exchange rate provides very similar results and thus are not reported.

Table 4**Comparison of 'Good' and 'Bad' News**

Price Difference (Tokyo Price - U.S. Price)

Exchange Rate = Tokyo*

Announcement Type

Mean (Dollar amount)
(s.e.)Mean (Deflated by price)
(s.e.)

'Good'

-.4823
(.3384)-.0054
(.0052)

'Bad'

-.5399
(.2647)-.0174
(.0069)

'None'

-.1473
(.0042)-.0027
(.0001)

Standard Error of Price Difference

Exchange Rate = Tokyo*

Announcement Type

S.E. (Dollar amount)
(s.e.)S.E. (Deflated by price)
(s.e.)

'Good'

2.6110
(.4151).0385
(.0039)

'Bad'

1.7146
(.1803).0429
(.0077)

'None'

1.0814
(.0204).0231
(.0003)

* Using New York exchange rate provides very similar results and thus are not reported.

Figure 1

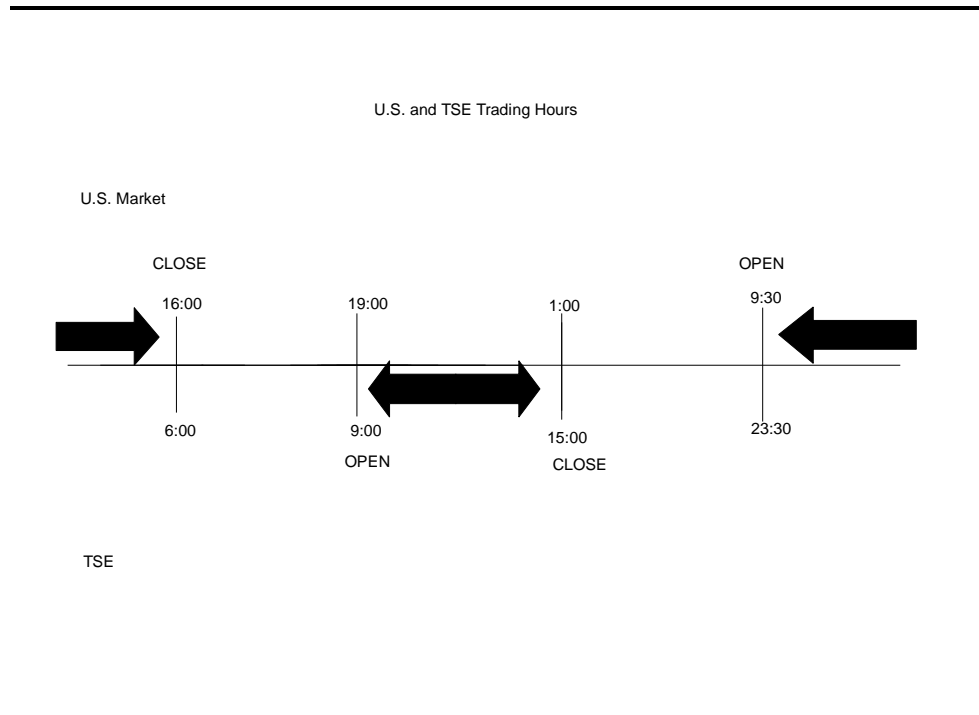


Figure 2

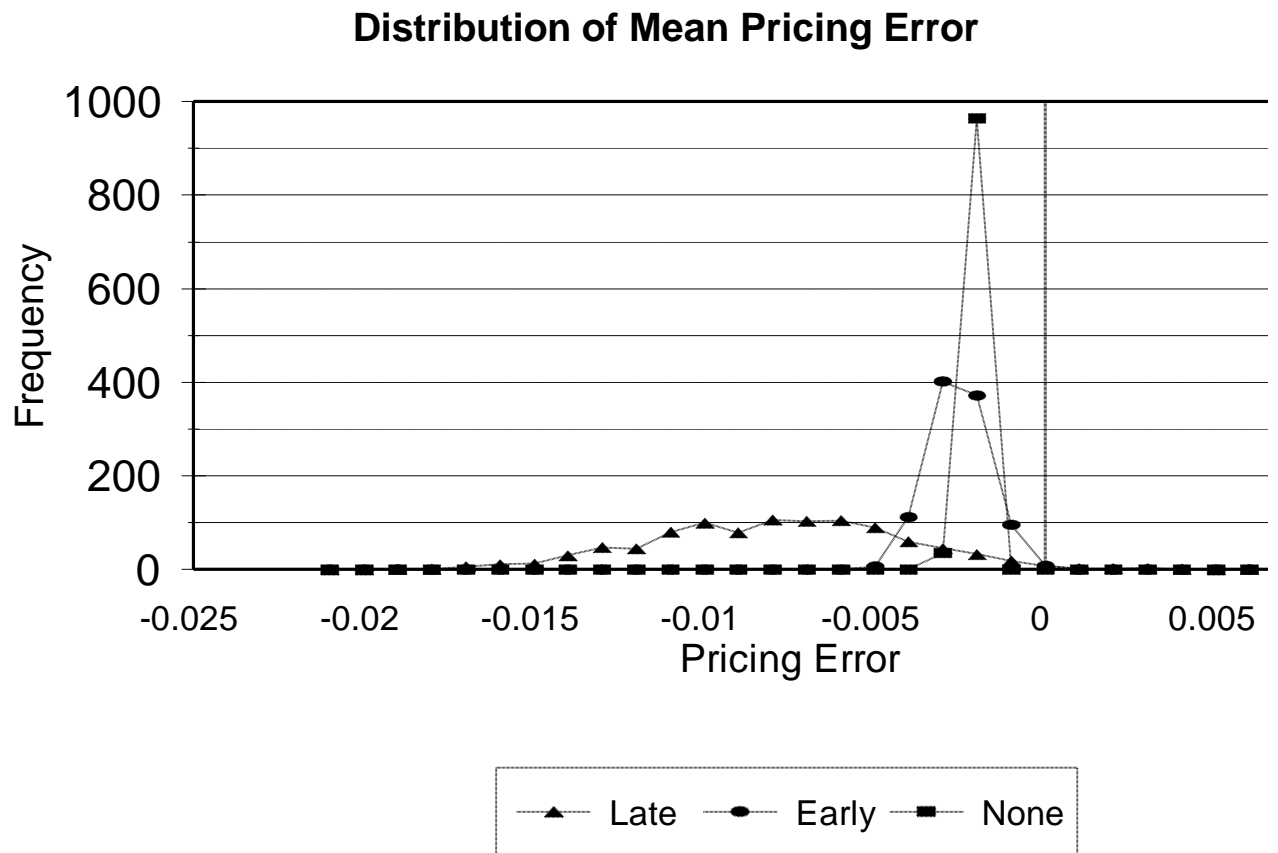


Figure 3

