**Insider Selling and Exchange Listing Stock Returns**

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**Abstract**

This paper examines whether prior insider selling functions as a signal of the stock performance around exchange listings and whether investors consider the revealed information on announced prior insider sales as a useful signal for evaluating firms’ listing decisions. Consistent with our hypothesis, while we observe no association between prior insider sales and listing day returns, we find that prior insider selling has a strong correlation with post-listing underperformance. Firms with pre-listing insider sales perform more poorly after listing than firms without prior insider sales. By employing a simultaneous equation approach, we also test the alternative explanation that insiders may have simply traded for portfolio adjustment or liquidity reasons. Our empirical results support the informational role of prior insider selling in anticipating post-listing stock returns.

*JEL classification:* G14; G32

*Keywords:* Insider selling; Exchange listing; Stock returns

 **1. Introduction**

 Insider trading has long been an issue of great interest in the literature. However, little research focuses on the relationship between insider sales and exchange listing. The empirical studies concerning exchange listing and firm performance show that the average firm experiences significantly positive abnormal returns prior to listing, while abnormal returns following listing on the exchange are typically negative. Meanwhile, researchers also document the return reversals around the listing period.[[2]](#footnote-3) The opportunism argument of Dharan and Ikenberry (1995) indicates that poor post-listing performance appears to be related to managerial timing of listing applications around the peaks in stock performance. Webb’s (1999) findings also support Dharan and Ikenberry. On the other hand, Cheng (2005) finds no underperformance of new listings in the post-listing period by using calendar-time analyses, consistent with the pseudo market timing hypothesis by Schultz (2003). Managerial actions that coincide with the peaks of firm’s stock prices do not necessarily mean the managers can forecast the overall market. Indeed managers can tell when their firms’ stock prices are high, and by taking actions like exchange listings at these times, there can be the appearance of foresight. However, given the possibility of self interest motivation, insiders of these firms inevitably have the incentive to act on their private information about the timing of listing. Thus, examining the exchange listing performance and the role of insiders should bring more insights about the issue.

As suggested by previous studies that insiders are able to identify the mispricing in equities of their own firms, insider trades hence have important signaling value for investors (e.g., Jaffe, 1974; Finnerty, 1976; Rozeff and Zaman, 1988; Lin and Howe, 1990; Lakonishok and Lee, 2001). Furthermore, researchers also document that insiders can even predict abnormal shifts of future stock price (Seyhun, 1988, 1992) and know of future firm-specific events, including bankruptcy (Seyhun and Bradley, 1997), corporate earnings announcements (Penman, 1982; Elliott et al., 1984), dividend initiations (John and Lang, 1991), seasoned equity offerings (Karpoff and Lee, 1991; Gombola et al., 1999), stock repurchases (Lee et al., 1992), takeover bids (Seyhun, 1990), and exchange listings (Lo et al., 2006). Together, these studies provide a theoretical framework on how insider trading is related to their private information on firm-specific events and offer empirically testable propositions.

In a setting where insiders have privileged knowledge about the firm’s potential projects, their voluntary sales of the firm’s stocks at least partially reveal their private information. Kahle (2000) shows that equity issues with prior insider sales are more likely to be overvalued, and thus more likely to underperform in the long run. This finding is consistent with the view that if insiders possess useful information, their selling should signal poor returns ahead. In accordance with this observation, we take the perspective that insider selling activity (subject to disclosure regulations) is one of the most direct signals available about exchange listing for conveying private information to the market. Given that insiders act on longer-term information rather than upcoming announcements suggested by prior research (e.g., Elliott et al., 1984; Ke et al., 2003), if insiders exploit the extraordinary pre-listing stock returns for personal gains, then insider sale transactions prior to the listing should be related to post-listing performance rather than to listing day returns. As a result, after listing performance should be poorer for firms with prior insider sales than those without.

The main purpose of this paper is therefore to examine the informational role of pre-listing insider selling by testing its relationship with the performance of exchange listing. Specifically, we wish to ascertain whether investors consider the revealed information on announced insider sales preceding listing as a useful signal for evaluating firms’ listing decisions, and whether the pre-listing insider sale activities can be an important mechanism to predict post-listing stock returns.

Over the last decade, the Taiwan Stock Exchange (TSEC) has attempted to lure OTC companies to list on the main board. Since 1992, many OTC firms have responded by moving from the OTC market to the TSEC. The moves of these firms, together with the unique regulation environment in Taiwan that requires the disclosure of *planned* insider sales before trading, provide a favorable opportunity for investigating the information value of insider behavior prior to exchange listing. Owing to the knowledge of insider sale is available to the market before trading, we can avoid the debate about when insider selling is publicly available. Besides, Lo et al. (2006) find that the information on insider sales reported after listing attracts only limited attention, while dissemination of planned insider selling before exchange listing can negatively influence the stock price in Taiwan market. Given that the market pays more attention to the pre-listing planned insider sales, we conduct our tests with sample firms from TSEC based on such knowledge. Since most of the related studies use data from the developed markets, our tests shed light on the nature of insider actions before listing in an emerging market characterized by more strict disclosure regulations on insider selling. Empirical results based on the Taiwanese data may reflect a relatively clearer informed trading behavior and may generate interesting empirical findings along the line of exchange listing.

By examining the association of insider sale transactions with stock returns around exchange listing, we hope to observe whether insider sales before listing are driven by exceptional pre-listing stock performance, and to assess the predictive capability of prior insider sales for exchange listing day effect as well as post-listing stock performance. We posit that insider sales based on excellent pre-listing returns will be reflected in the relationship between prior insider sale transactions and subsequent post-listing stock returns rather than the listing day returns. A negative association between prior insider sales and post-listing stock returns will indicate that pre-listing insider sales do signal poor future stock performance and can help predict the prospects of the firm.

This paper differs from the previous studies in several ways. First, it is the first attempt at analyzing the post-listing performance from the perspective of insider sales before listing, and provides new insights into the predictive ability of prior insider sales for exchange listing day effect and for post-listing performance. Second, by employing a simultaneous equation approach, it tests the alternative explanation that insiders may have simply traded for portfolio adjustment or liquidity reasons when stock performance is unusually good, regardless of information-based motivation. Finally, it extends the early research on exchange listing and insider trading in an emerging market outside the U.S. By providing evidence that prior insider sale transactions, motivated by their private information regarding listing decisions, have a strong effect on the post-listing underperformance, we believe that this paper contributes to the existing literature on the informational role of insider trading around exchange listing.[[3]](#footnote-4)

The remainder of this paper is organized as follows. Section 2 discusses the data and explains the methodology. Empirical results are analyzed in Section 3. Finally, Section 4 summarizes the conclusions and their implications.

**2. Data and methodology**

**2.1 Exchange listing procedure in Taiwan**

 Similar to the regulation in the US, a detailed sequence of procedures must be followed by a firm to obtain a listing on the Taiwan Stock Exchange (TSEC). First, a firm must meet certain exchange standards that include a minimum firm age, a minimum realized capital, a minimum net income, and a minimum number of owners of round lots of shares. Next, the firm applies for listing in discussion with an exchange. Following a formal application for listed status, an official announcement appears in the exchange’s bulletin. Then the exchange issues an approval of the listing application followed by the date on which the firm is to commence trading on the exchange. These dates (the approval day and the listing day) are published in subsequent issues of statement. Finally, all firms that are approved for listing must enter into a listing agreement with the TSEC.[[4]](#footnote-5) Though the interval between application announcement and listing date may vary in length from company to company, the average (median) period of the sample firms used in this study is 102 (80) days with a minimum of 52 days and a maximum of 574 days.[[5]](#footnote-6)

**2.2 Sample selection and data on insider sale trades**

 The sample of exchange listings and their announcement dates are identified from the TSEC and the Market Observation Post System (MOPS), the online service provided by TSEC, over the period from January 1992 through December 2002 in which there were no changes in insider trading laws. We obtain 191 OTC sample firms changing trading marketplace to the TSEC, excluding observations with incomplete data.

 Article 22-2 of Securities and Exchange Act in Taiwan defines insiders as directors, managers, or shareholders with holdings more than ten percent of the total outstanding shares. According to the Securities and Exchange Act ([Article 22-2](http://eng.selaw.com.tw/FLAWDOC01.asp?lsid=FL007009&lno=22-2) and 25), insiders who want to sell their stocks on the open market must file their plans in advance with the regulatory authority. Also, if insiders do not complete the planned sales during the permitted transaction period, they still have to report any unfulfilled sales after the expiration of the transaction period. Additionally, insiders shall file, by the fifth day of each month, a report with the issuer of the changes in the number of shares they held during the preceding month. The issuer shall then compile the insider trading data and file the report of changes with the authority by the fifteenth day of each month. The data on insider sales are obtained from the database of *Taiwan Economic Journal* (TEJ), and MOPS is used to verify the insider trading information. The TEJ database contains all transactions of stock sales reported by insiders subject to disclosure regulations described in the Securities and Exchange Act. As Seyhun (1992) shows that open market transactions are more informative than other types of trades, our analysis focuses on voluntary open market sales by insiders within the one-year period prior to the listing day.

 Furthermore, because regulation and practice in Taiwan demand more than a year for a firm to actually be listed after announcing its board decision to do so, we consider a full year period before listing to capture the full effects of its information content on the listing day returns and on the post-listing stock returns. Given the security ordinance in Taiwan that requires reporting the frequency of insider sales, but not the purchases of the stocks, and the evidence reported by Lo et al. 2006 that the market participants treat the pre-listing insider sales as a negative signal regarding the future prospects of the exchange listing in Taiwan stock market, there is reason to believe a priori that investors consider an unweighted measure of insider sale trades useful. Therefore, unlike previous studies on aggregate (net) insider trading, this paper uses the number of insider sales to measure the intensity of information content signaled by insider’s actions, since net sales of stock may still have some insiders buying shares and examination of sales alone might be more informative than net sales. Also, trading frequency served as a measure of information content is supported by Kyle (1985) that insider information is gradually incorporated into the price with their accumulating orders. A volume-based measurement will be discussed for robust testing in Section 3.5.

Of 191 sample firms, 119 have at least one insider sale trade reported on the TEJ database during the sample period, and the number of insider sales amounts to 436, averaging 3.66 for each firm.[[6]](#footnote-7)

**2.3 Methodology**

We use the abnormal stock returns to indicate the effects of the event under study. The primary methodology employed to measure the average magnitude of abnormal returns is based upon the market-adjusted returns model, which avoids the need to estimate controversial betas. We obtain daily stock returns from the TEJ’s daily stock price file. The OTC index and TSEC index are used as the proxies for the pre-listing and post-listing markets respectively, and the abnormal returns are computed as the returns in excess of the market index. In order to test the link between the stock performance and insider selling before listing, abnormal returns are calculated first over the pre-listing period from 251 days before to 2 days before the listing day (t=0), then over the 3-day listing event window from day t=-1 to day t=+1, and finally over the post-listing period from day t=+2 to day t=+251.

For comparison, we also examine various firm characteristics for the year before and after listing, including market value, insider ownership, daily volume turnover, and systematic risk (beta) that may help explain insider sale trading around exchange listing.

To assess whether investors consider insider sales preceding listing as useful information for evaluating firm’s listing decisions, a regression approach is used to investigate the effect of prior insider sales on the returns of listing period (t-1 to t+1). To control for factors possibly related to listing effects, the ordinary least squares (OLS) regression model is specified as follows:

 (1)

where *ListingdayCARi* is the abnormal returns for the listing event window (t-1 to t+1); the primary independent variable, *InsiderSellingi*, is the number of insider sales reported in the one year period before the listing day; *PrelistingCARi* is the cumulative abnormal returns over 250 days before the listing day (t-251 to t-2); *Sizei* is the log of the average market value of equity in the year prior to the listing; *Ownershipi* is the average percentage of holdings held by insiders in the year prior to the listing; and *Dindustryi* is a dummy equal to one for firms classified as in the electronic industry.[[7]](#footnote-8)

We control for the firm size and insider ownership because previous evidence shows that firms with higher insider holdings experience greater announcement returns for various corporate decisions such as stock repurchases (Vermaelen, 1981), dividend initiations (Born, 1988), sell-offs (Hirschey and Zaima, 1989), stock splits (Han and Suk, 1998a), and junior-for-senior (Hull and Mazachek, 2001). Specifically, Han and Suk (1998a), who use firm size as a proxy for the level of information asymmetry, find that the significant relationship between insider ownership and announcement returns is due to small firm effect. In addition, *PrelistingCAR* can be interpreted as a measure of the extent to which the listing day effect might be predicted by the market. As electronic firms dominate our sample, we also include a dummy to control for the industry effect.

 Next, we employ the regression framework to examine the association of prior insider sale transactions with post-listing stock returns. In other words, our interest lies in ascertaining the predictive content of pre-listing insider sales for future return prospects. The models are given by the following representations:

  (2)

  (3)

where *PostlistingCARi* is the cumulative abnormal returns over 250 days after the listing day (t+2 to t+251); *Betai* is the systematic risk of the firm’s stock estimated by the market model over 250 days before listing; and the other variables are defined in the same way as in Equation (1).

 In addition to the testable relationship in Equation (2), we also use an expanded model in Equation (3) to better compare the results across firms by controlling various firm characteristics proved important in determining stock returns. These include the level of insider ownership (*Ownership*), the size effect (*Size*), the systematic risk (*Beta*) and the industry effect (*Dindustry*). Han and Suk (1998b) suggest that the level of insider ownership is positively related to the stock returns. Dharan and Ikenberry (1995) find that poor post-listing performance is more severe for smaller firms.

To the extent that prior insider sales serve as a valuable signal for post-listing stock performance, the estimated coefficients of *InsiderSelling* are considered to be negative.

**3. Empirical results**

**3.1 Comparisons of abnormal returns before and after exchange listing**

 We first examine daily abnormal returns of sample firms moving from the OTC market to the TSEC to determine whether these firms experience positive abnormal returns before listing and negative abnormal returns after listing. Also, various firm characteristics that may help explain insider sales around exchange listing are presented. Table 1 lists cumulative abnormal returns (CARs) for all the sample listings and the two subgroups—firms with and without prior insider sales. On average, the cumulative abnormal return (CAR) from the application announcement to the actual listing day is 6.77%, and CAR over 250 days before listing reaches 11.46%, both significant at the 0.01 level. Meanwhile, the CARs over 50, 150, and 250 days after listing are -5.65%, -3.66%, and -14.13%, respectively, all significant at the 0.1 level or better. The findings are further verified by the declines in market value as well as by the decreases in insider ownership percentages following the listing. Additionally, the three-day CAR for the listing window (t-1 to t+1) is not significantly different from zero. These results are consistent with the evidences from previous studies regarding exchange listing as mentioned above.

For ease of comparison, the similar data of sample firms with and without pre-listing insider sales are provided in column 3 and 4 in Table 1. Also, the *t*-tests and non-parametric Mann-Whitney tests for the mean and median difference between subgroups are reported in column 5 and column 6. We find that the pre-listing stock returns for firms with prior insider sales are essentially the same as those without insider sales, both showing strong pre-listing performance. For listing day returns, firms with insider sales experience a negative -0.49%, compared with a positive 0.60% for those without insider sales on average. However, both cases and the difference between the two subgroups are insignificant at traditional levels. By contrast, firms in which insiders sell their holdings before listing suffer more negative post-listing abnormal returns than those without prior insider sales, and the mean differences are statistically significant. The evidence clearly demonstrates a negative relationship between prior insider sales and post-listing stock returns and lends support to the conjecture that insiders time their trades to take advantage of extraordinary pre-listing performance and avoid a potential loss that would be suffered if they postpone their sales until the post-listing period.

 Table 2 lists the comparisons of various firm characteristics. We find that the market value and volume turnover before listing are significantly larger for the subgroup with insider sales, indicating that insider sales appear to be concentrated on the stocks of larger companies and that these sales seem to trigger a wave of transactions by other market participants. These results are consistent with the findings of Finnerty (1976) and support the leading indicator hypothesis of Givoly and Palmon (1985). We also observe that insider ownership percentages are significantly lower for firms with prior insider sales, reflecting the phenomenon that insiders tend to decrease their stock holdings in anticipation of poor future prospects. The results in Table 1 and Table 2 indicate that exceptional pre-listing stock returns and poor post-listing performance are evident in Taiwan stock market, and the differences between the subgroup with insider sales and that without insider sales are pervasive across post-listing performance and firm characteristics.

 The correlation matrix for the variables is reported in Table 3. The Pearson (Spearman) correlation coefficients are reported at the lower-triangle (upper-triangle). As expected, *InsiderSelling* variable shows significantly negative relation to *PostlistingCAR* in both measures, implying that insider sales preceding listing convey information about poor future prospects. Additionally, Table 3 apparently shows a negative correlation between *PrelistingCAR* and *PostlistingCAR*. This result suggests that firms with strong pre-listing performance tend to significantly underperform in the post-listing period, and thus supports the opportunism hypothesis for these stocks. Moreover, the correlation between *Size* and *InsiderSelling* is statistically significant with the positive sign, and is in line with previous findings that insider sales tend to be concentrated on large company stocks (Rozeff and Zaman, 1988). However, *Size* is negatively related to *Ownership*. This negative relationship between firm size and insider ownership is consistent with Demsetz and Lehn (1985), who attribute the negative association to wealth constraints and risk aversion of insiders.

**3.2 Prior insider sales and listing day returns**

 Based on the signaling model of insider trading in John and Mishra (1990), the implications for insider sales prior to the listing are derived from the strategies of the insiders and the pricing function in the efficient market. By this reasoning, listing firms accompanied by more insider sales before listing should elicit more negative stock price responses than those accompanied by fewer or no prior insider sales.

To test for the directional relationship, the sample firms are divided into three subgroups according to the number of insider sales reported before listing. As shown in Panel A of Table 4, positive listing period returns are observed for subgroup 1 and subgroup 2 (firms without and with fewer prior insider sales), while the three-day CAR (t-1 to t+1) is negative for subgroup 3 (firms with more insider sales). However, none of these mean CARs is statistically significant, neither is the difference across subgroups. The results in both Panel A and Panel B of Table 4 provide further evidence that, with regard to the signaling effect on the listing event, firms with different insider selling patterns appear to elicit similar market responses.

To further verify the informational role of insider sales before listing, a regression approach is used to test whether the activity of pre-listing insider selling provides a useful context for evaluating exchange listing decisions. Table 5 reports the results of estimation for Equation (1). The coefficient estimate on *InsiderSelling* is negative but insignificant (*t*=-0.378), indicating that there is little relation between prior insider sales and listing day effect. Interestingly, the coefficient estimated on *Size* is negative (-0.208) and significant at the 0.01 level (*t*=-2.714), which suggests that firm size, instead of insider selling, affects listing day CARs, and has greater effect for smaller sized firms.[[8]](#footnote-9)

**3.3 Prior insider sales and post-listing stock returns**

 Given the insignificant relationship between prior insider sales and listing period returns presented in the previous section, we then examine the association of post-listing stock returns with prior insider selling based on the information asymmetry context. If insiders do exploit the extraordinary pre-listing stock returns for personal gains, then their sales before listing should be related to the post-listing performance.

 As shown in Table 1, post-listing stock returns are more negative for firms with insider sales before listing than those without. Correlation analysis in Table 3 also depicts significant connection between these two variables. To further explore the predictive capacity of prior insider sales for post-listing stock returns, we perform additional tests with results provided in Table 6. Consistent with earlier prediction, the sample is again partitioned into 3 subgroups and the post-listing stock returns decrease monotonically with increasing insider sales. The test statistics in Panel B also reveal that post-listing returns are significantly different across subgroups (*F*=3.21).

Table 7 reports regression results of Equations (2) and (3). The estimated coefficient of *InsiderSelling* variable in Equation (2) is -0.139 (*t*=-2.262), significant at the 0.05 level, indicating that post-listing stock performance is negatively related to insider sales before listing. This negative relation prevails even after controlling for other factors in Equation (3). The magnitude and significance level are virtually identical, and the coefficient estimate on *InsiderSelling* still maintains its negative sign. This evidence suggests that the negative effect of prior insider sales on the post-listing stock returns is greater for firms that have more insider sale transactions reported in the pre-listing period.

Notably, empirical results in Table 7 also exhibit negative and significant coefficients on *PrelistingCAR* in both models. This negative relation suggests that firms with more favorable pre-listing performance tend to experience poorer post-listing performance, and buttresses further the opportunism hypothesis of Dharan and Ikenberry (1995), in which managers appear to change the trading market to an exchange at times of high performance.

In conclusion, these results help corroborate our hypothesis that insider sales will signal subsequent post-listing stock returns. The findings on the predictive content of insider transactions for subsequent stock returns are primarily consistent with related literature (Seyhun, 1988; Seyhun and Bradley, 1997; Karpoff and Lee, 1991). Consequently, investors of soon-to-be-listed companies can expect a more negative post-listing stock performance as the number of pre-listing insider sales increases.

**3.4 Test for non-information based insider sales before listing**

 As shown in Table 3 and Table 7, post-listing performance has a statistically significant relationship with the number of prior insider sales. However, regardless of information-based motivation, the observed negative relationship can also be explained by portfolio adjustments or liquidity reasons when insiders consider the stock price exceptionally high. To explore this possibility, we estimate the following regression using the negative binomial model to address the relationship between prior insider selling and pre-listing CARs since our dependent variable is the number of insider sales and our data do not meet the requirement of Poisson distribution.

 (4)

where the variables are measured in the same way as in Equation (3). As firm size does affect insider trading activity (Ke et al., 2003; Lakonishok and Lee, 2001), the variable *Size* is included to count for the size difference among firms. In addition, we control the insider ownership (*Ownership*) since it may affect the degree of information access, and greater access to inside information may lead to more active trading (Demsetz, 1986). Likewise, the industry effect is neutralized by the dummy variable *Dindustry*.

If insiders exploit the private information about the listing decisions to trade their shares, then relatively more insider sales would be made for firms with more negative post-listing stock returns. As such, a highly negative relation is expected between post-listing stock returns and prior insider sales. However, if insiders have just timed their sales for portfolio adjustments or liquidity reasons under unusually good stock prices regardless of information-based consideration, insider selling should be also related to pre-listing stock performance (*PrelistingCAR*).

Table 8 presents the estimation results of Equation (4) using a simultaneous regression with respect to Equation (3). The coefficient on *PostlistingCAR* is negative and significant (*t*=-1.937), while the coefficient on *PrelistingCAR* is insignificant (*t*=-0.096). Consistent with our conjecture, this finding suggests that insider sales before listing are related to the subsequent poor stock returns, and that, on average, there are more insider sales for firms with more negative post-listing stock returns. Furthermore, this result supports the claim that insider sales before listing are motivated by the inside information of post-listing underperformance. We also find that *Size* is positively and significantly associated with *InsiderSelling*, confirming previous evidence that large firms tend to have more insider sales than small firms do. Overall, the findings in Table 8 support the view that insiders have access to private information that is related to managerial timing of listing decisions, and trade their sales before listing accordingly.

**3.5 Further tests**

 Several tests are performed to check for the robustness of the results. First, there are pairs of independent variables that are significantly correlated with each other (see Table 3). As this may cause collinearity problems, variance inflation factors (VIFs) are analyzed according to the diagnostic test of Kennedy (1986). As shown in Table 5 and Table 7, VIFs for Equations (1) through (3) are all below 3, indicating that collinearity does not pose an issue in this study. Also note that the directional relationship between dependent variable and various independent variables does not reverse when other independent variables are included. Additionally, based on the Glejser’s test (1969), heteroskedastic error terms are examined by regressing them on independent variables. This analysis also indicates no problems. The *R*2s are quite close to zero in all cases. The tests are unable to reject the hypothesis that the errors are homoskedastic. As for Equation (4), we re-estimate the parameters by computing robust standard errors and find the results similar to those reported in Table 8.

Second, to check if the results are influenced by the outliers, we re-estimate Equations (1) through (4) after deleting observations with three or higher standard deviations from each sample mean for all variables. The regression results are virtually the same as those reported above.

Third, we conduct the same tests using the number of shares traded (a volume-based measure of *InsiderSelling* variable) instead of the number of insider sales. For scaling effect, we take the natural logarithm of the number of shares for insider sales. While the magnitude and significance level are lower using this volume-based measure in the tests, we find that these two approaches provide similar results.[[9]](#footnote-10) With regard to the information effects of prior insider sales on listing period returns and on post-listing performance, we find no meaningful difference comparing with the results in Table 4 to Table 8.

Finally, to examine whether the results are sensitive to the choice of performance measure, abnormal returns are re-estimated using the market model and the buy-and-hold method. The parameters of the market model for the pre-listing event period are estimated based on the daily returns of 150 trading days (t= -401 to t= -252) using the OTC index as the proxy for the market. For the post-listing event period, the estimation interval is from t= +252 to t= +401 and the TSEC index is the proxy for the market. Likewise, we calculate the buy-and-hold abnormal returns relative to the OTC index for the pre-listing event period and the TSEC index for the post-listing event period. The results obtained qualitatively resemble those generated using the market-adjusted returns model. In addition, as shown in Table 1, Table 2, Table 4 and Table 6, we also use the non-parametric statistics to retest the results, and find no inconsistencies with the parametric tests depicted above.

**4. Summary and conclusions**

This paper extends the studies of exchange listing and insider trading by examining the informational role of prior insider sales in stock returns around exchange listing in Taiwan market. Although previous research has documented a great deal about market reactions to exchange listings, few inquiries have been made about related insider activity and the effects of prior insider trading on listing day returns and post-listing performance.

Our empirical results indicate that stock exchange listings on the TSEC typically experience excellent pre-listing performance and poor post-listing returns. Statistical tests on subgroups formed according to the number of insider sales reported before listing show that firms with more pre-listing insider sales significantly underperform in the post-listing period when compared to those with fewer or no prior insider sales. Correlation and regression analyses not only offer further evidence that the pattern of insider selling before listing affects the post-listing performance, but also show that poor post-listing performance becomes more severe when pre-listing insider sales increase. Additionally, firms with better pre-listing performance appear to suffer greater negative post-listing impact. However, we find that prior insider sales do not have a significant valuation effect on listing day returns, and that the price reversal phenomenon found in exchange listing literature is not related to insider selling activity before listing. Together, these empirical results support the informational role of prior insider sales in anticipating a firm’s post-listing underperformance. Also, these findings imply that the efficiency with which insider trading around exchange listing deserves examination.

For practical implications, our findings can guide investors of soon-to-be-listed companies in evaluating the significance of an increase in pre-listing insider sale transactions. Investors of firms with more prior insider sales can anticipate a more negative post-listing performance and develop effective trading strategies by utilizing the information content of the selling activities of insiders. Besides, insider trading provides a useful leading indicator of future economic prospects, which means that analysts can gain the ability to time markets by knowing the actions of insider sales. Moreover, these results should encourage officials and regulators to consider a more substantial and timely disclosure policy relating to the identification of insider actions.

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**Table 1 CARs of sample firms around exchange listing during 1992-2002**

This table presents CARs of sample firms before and after exchange listing from 1992 through 2002. The firms with prior insider sales are those in which there is at least one insider sale trade reported on the TEJ database within the one-year period before the listing day. The test statistics in column 5 and column 6 are heteroscedastic *t*-tests of equal means and non-parametric Mann-Whitney *p*-values of equal medians comparing firms with prior insider sales (column 3) with firms without prior insider sales (column 4). Figures in parentheses are median values. \*, \*\* and \*\*\* indicate statistical significant at the 0.1, 0.05 and 0.01 levels, respectively.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | All firmsN=191 | Firms with prior insider salesN=119 | Firms without prior insider salesN=72 | *t*-statistics for the difference | Mann-Whitney *p*-vaules for the difference |
| CARs over the 250 days before listing (%)CARs over the 100 days before application (%)CARs from application to listing days (%) CARs over the listing period (%)CARs over the 50 days after listing (%)CARs over the 150 days after listing (%)CARs over the 250 days after listing (%) | 11.46 (10.68)5.00 (5.36)6.77 (4.40)-0.07 (-0.08)-5.65 (-6.65)-3.66 (-5.21)-14.13(-12.36) | 11.67 (11.82)5.11 (4.52)6.23 (5.41)-0.49 (-0.83)-7.03 (-6.20)-5.97 (-6.30)-17.57 (-13.90) | 11.11 (10.96)4.81 (4.48)7.66 (6.63)0.60 (0.13)-3.37 (-6.77)0.15 (-4.21)-8.46 (-8.56) | 0.080.07- 0.37- 1.45-1.98\*\*- 1.71\*- 2.56\*\* | 0.990.900.760.140.47 0.10\* 0.07\* |

**Table 2 Comparisons of various firm characteristics**

This table provides comparisons of various firm characteristics between firms with prior insider sales and firms without prior insider sales. The firms with prior insider sales are those in which there is at least one insider sale trade reported on the TEJ database within the one-year period before the listing day. The test statistics in column 5 and column 6 are heteroscedastic *t*-tests of equal means and non-parametric Mann-Whitney *p*-values of equal medians comparing firms with prior insider sales (column 3) with firms without prior insider sales (column 4). Figures in parentheses are median values. \*, \*\* and \*\*\* indicate statistical significant at the 0.1, 0.05 and 0.01 levels, respectively.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | All firmsN=191 | Firms with prior insider salesN=119 | Firm without prior insider salesN=72 | *t*-satistics for the difference | Mann-Whitney *p*-values for the difference |
| Firm age on listing day (years)Market Value before listing (NT $billions)Market Value after listing (NT $billions)Insider ownership before listing (%)Insider ownership after listing (%)Volume turnover before listing Volume turnover after listingBeta before listingBeta after listing | 17.61 (16.33)7,270 (3,495)6,862 (3,049)35.45 (34.57)32.15 (31.12)1.49 (1.31)1.73 (1.29)0.89 (0.91)0.81 (0.84) | 17.03 (14.25)8,181 (3,697)7,425 (3,411)34.34 (32.70)30.34 (29.98)1.69 (1.45)1.85 (1.49)0.91 (0.96)0.83 (0.87) | 18.58 (18.25)5,764 (2,324)5,932 (2,135)37.30 (36.34)35.13 (36.80)1.17 (1.03) 1.52 (0.91)0.85 (0.83)0.78 (0.84) | -1.26 1.83\*1.28 -1.67\* -2.25\*\* 3.24\*\*\*1.350.861.15 | 0.05\*0.00\*\*0.02\*0.110.06\*0.10\*0.130.910.98 |

**Table 3 Correlation coefficients between selected variables**

The Pearson (Spearman) correlation coefficients are reported at the lower-triangle (upper-triangle). *InsiderSelling* is the number of insider sales reported during the one year period before the listing day; *ListingdayCAR* is the abnormal returns for the listing window (t-1 to t+1); *PrelistingCAR* is the pre-listing period abnormal returns over 250 days before listing (t-251 to t-2); *PostlistingCAR* is the post-listing period abnormal returns over 250 days after listing (t+2 to t+251); *Size* is the log of market value of equity in the year prior to the listing; *Ownership* is the percentage of holdings held by insiders in the year prior to the listing; *Beta* is the systematic risk of the firm estimated by the market model over 250 days before listing ; and *Dindustry* is a dummy equal to one for firms classified in the electronic industry. The sample size is 191. \*, \*\* and \*\*\* indicate statistical significant at the 0.1, 0.05 and 0.01 levels, respectively.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Insider-**Selling* | *Listingday-**CAR* | *Prelisting-**CAR* | *Postlisting-**CAR* | *Size* | *Ownership* | *Beta* | *Dindustry* |
| *InsiderSelling**ListingdayCAR**PrelistingCAR**PostlistingCAR**Size**Ownership**Beta**Dindustry* | - 0.0930.101- 0.175\*\*0.195\*\*\*- 0.043 0.004- 0.053 | - 0.048- 0.0530.138\*- 0.203\*\*\*0.046 0.096- 0.039 | 0.026- 0.054- 0.524\*\*\*- 0.034- 0.039 0.0540.173\*\* | - 0.151\*0.150\*\*- 0.460\*\*\*0.0030.089- 0.015- 0.091 | 0.252\*\*\*- 0.161\*\*- 0.0150.034-0.232\*\*\*0.242\*\*\*0.217\*\*\* | - 0.044- 0.001- 0.0420.098- 0.223\*\*\*- 0.159\*\*- 0.052 | 0.0090.132\*0.097- 0.0280.290\*\*\*- 0.146\*\*0.676\*\*\* | - 0.061- 0.0360.175\*\*- 0.0550.263\*\*\*- 0.0490.688\*\*\* |

**Table 4 CARs by subgroup over the listing period (t-1 to t+1)**

This table reports three-day CAR (t-1 to t+1) for the sample of 191 exchange listings from 1992 through 2002. Panel A reports the results for the full sample and three subgroups with t-tests and Wilcoxon sign rank tests on whether CAR is equal to zero. The three subgroups are formed according to insider sales reported before listing. Panel B provides *F*-test and non-parametric Kruskal-Wallis test for equality of listing period CARs across subgroups. The statistic reported for Kruskal-Wallis test is *p*-value. \*, \*\* and \*\*\* indicate statistical significant at the 0.1, 0.05 and 0.01 levels, respectively.

|  |
| --- |
|  Panel A Listing period CAR by subgroup |
| Subgroup | Number of observations | Insider sales before listing | Mean CAR (%) | *t*-statistics  |  Median CAR (%) | Wilcoxon *p-*values |
| 123Total | 726257191 | 00< No. <=2 (Median)2< No. <=26 (Max.)0-26 | 0.600.10-1.03-0.07 |  1.02 0.15-1.69-0.21 | 0.13 0.00-1.70-0.08 | 0.550.94 0.09\*0.43 |
| Panel B Test for equality of listing period CARs across subgroups  |
| Test | Subgroups compared | Statistics |
| *F*-testKruskal-Wallis test | 1, 2 and 31, 2 and 3 | 1.850.70 |

**Table 5 Regression results of listing day CARs on prior insider sales**

This table reports regression results of prior insider sales on the returns of listing period (t-1 to t+1). The dependent variable, *ListingdayCAR*, is the abnormal returns for the listing event window (t-1 to t+1). *InsiderSelling* is the number of insider sales reported in the one year period before the listing day; *PrelistingCAR* is the pre-listing period abnormal returns over 250 days before listing (t-251 to t-2); *Size* is the log of market value of equity in the year prior to the listing; *Ownership* is the percentage of holdings held by insiders in the year prior to the listing; and *Dindustry* is a dummy equal to one for firms classified in the electronics industry. VIF represents the variance inflation factor and is used to detect whether multicollinearity is a problem. Figures in parentheses are *t-*values. \*, \*\* and \*\*\* indicate statistical significant at the 0.1, 0.05 and 0.01 levels, respectively.

|  |  |  |
| --- | --- | --- |
| Independent Variables | Estimates | VIF |
| *Intercept**InsiderSelling**PrelistingCAR**Size**Ownership**Dindustry**F-*statistic *p*-value*R*2Adj. *R*2Number of observations | 1.076 (2.753\*\*\*)-0.028 (-0.378)0.023 (0.319)-0.208 (-2.714\*\*\*)0.007 (0.100)-0.117 (-1.567)2.8120.018\*\*0.0710.046191 | 1.0601.0491.1671.0591.101 |

**Table 6 CARs by subgroup over the post-listing period (t+2 to t+251)**

This table reports post-listing CAR (t+2 to t+251) for the sample of 191 exchange listings from 1992 through 2002. Panel A shows results for the total sample and three subgroups with *t*-tests and Wilcoxon sign rank tests on whether CAR is equal to zero. The three subgroups are formed according to insider sales reported before listing. Panel B provides *F*-test and non-parametric Kruskal-Wallis test for equality of post-listing CARs across subgroups. The statistic reported for Kruskal-Wallis test is *p*-value. \*, \*\* and \*\*\* indicate statistical significant at the 0.1, 0.05 and 0.01 levels, respectively.

|  |
| --- |
|  Panel A Post-listing CARs by subgroup |
| Subgroup | Number of observations | Insider sales before listing | Mean CAR (%) | *t*-statistics  |  Median CAR (%) | Wilcoxon *p-*values |
| 123Total | 726257119 | 00< No. <=2 (Median)2< No. <=26 (Max.)0-26 | -8.46-15.15-20.20-14.13 | 2.35\*\*2.61\*\* 3.12\*\*\* 3.10\*\*\* | -8.56-12.66-16.74-12.36 | 0.08\*0.06\*0.06\*0.01\*\*\* |

Panel B Test for equality of post-listing CARs across subgroups

|  |  |  |
| --- | --- | --- |
| Test | Subgroups compared | Statistics |
| *F*-testKruskal-Wallis test | 1, 2 and 31, 2 and 3 |  3.21\*\*0.10\* |

**Table 7 Regression results of post-listing CARs on prior insider sales**

This table reports the association of prior insider sale transactions with post-listing stock returns. The dependent variable, *PostlistingCAR*, is the post-listing period abnormal returns over 250 days after listing (t+2 to t+251). *InsiderSelling* is the number of insider sales reported in the one year period before the listing day; *PrelistingCAR* is the pre-listing period abnormal returns over 250 days before listing (t-251 to t-2); *Size* is the log of market value of equity in the year prior to the listing; *Ownership* is the percentage of holdings held by insiders in the year prior to the listing; *Beta* is the systematic risk of the firm estimated by the market model over 250 days before listing; and *Dindustry* is a dummy equal to one for firms classified in the electronics industry. VIF represents the variance inflation factor and is used to detect whether multicolinearity is a problem. Figures in parentheses are *t-*values. \*, \*\* and \*\*\* indicate statistical significant at the 0.01, 0.05 and 0.01 levels, respectively.

|  |  |  |
| --- | --- | --- |
|  Independent Variables |  Equation (2)  |  Equation (3)  |
| Estimates | VIF | Estimates | VIF |
| *Intercept**InsiderSelling**PrelistingCAR**Size**Ownership**Beta**Dindustry**F-*statistic *p*-value*R*2Adj. *R*2 Number of observations | -1.319 (-0.286)-0.139 (-2.262\*\*)-0.514 (-8.371\*\*\*)39.1260.000\*\*\*0.2940.286191 | 1.0051.005 | -0.826 (-0.736)-0.143 (-2.251\*\*)-0.509 (-7.925\*\*\*)0.033 (0.499)0.069 (1.070)-0.009 (-0.105)-0.008 (-0.088)13.0720.000\*\*\*0.2990.276191 | 1.0621.0821.1741.0851.9762.019 |

**Table 8 Negative binomial regression results of factors affecting insider sales before listing**

This table reports regression results of factors affecting insider sales before listing based on the negative binomial model. The dependent variable, *InsiderSelling*, is the number of insider sales reported in the one year period before the listing day; *PrelistingCAR* is the pre-listing period abnormal returns over 250 days before listing (t-251 to t-2); *PostlistingCAR* is the post-listing period abnormal returns over 250 days after listing (t+2 to t+251); *Size* is the log of market value of equity in the year prior to the listing; *Ownership* is the percentage of holdings held by insiders in the year prior to the listing; and *Dindustryi* is a dummy equal to one for firms classified in electronics industry. Figures in parentheses are *t-*values. \*, \*\* and \*\*\* indicate statistical significant at the 0.1, 0.05 and 0.01 levels, respectively.

|  |  |
| --- | --- |
|  Independent Variables | Estimates |
| *Intercept**PrelistingCAR**PostlistingCAR**Size**Ownership**Dindustry**LR-*statistic *p*-value*R*2Adj. *R*2Number of observations | -2.064 (-2.015\*\*)-0.0002 (-0.096)-0.035 (-1.937\*)0.337 (3.070\*\*\*)0.007 (0.885)-0.442 (-2.011\*\*)125.4550.000\*\*\*0.0810.056191 |

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2. See Ying et al. (1977), Grammatikos and Papaioannou (1986), McConnell and Sanger (1987), Edelman and Baker (1990, 1994), Dharan and Ikenberry (1995), and Webb (1999), etc. [↑](#footnote-ref-3)
3. Lamba and Khan (1999) also examine the aggregate trading activities of insiders before exchange listing and delisting and find that insiders exploit their private information by purchasing or postponing the sale of stock before listing. However, they do not empirically analyze the effect of insider sales on the listing day returns and on the post-listing performance as we do here. [↑](#footnote-ref-4)
4. Much of the information in this section has been drawn from [www.tse.com.tw](http://www.tse.com.tw). [↑](#footnote-ref-5)
5. A search of the Taiwan Stock Exchange bulletin over the period 1992 to 2002 reveals no firms that formally applied for an application to transfer from the OTC market to list on the TSEC was rejected. [↑](#footnote-ref-6)
6. In spite of the planned nature of such sales reported by insiders, the fulfilled ratio reaches 85% during our sample period. [↑](#footnote-ref-7)
7. Electronic firms are defined as firms with two-digit SIC code of 23, 24, 30, 31, 32, 33, 34, 35, 53, 54, 61, 62, and 80. [↑](#footnote-ref-8)
8. We also use the time interval from t-5 to t+5 to retest the listing day effect, and find similar results. [↑](#footnote-ref-9)
9. As the securities ordinance described in Footnote 2 requires insiders to report planned sales and unexecuted trades, if any. We also use the *actual* insider sales, measured by subtracting unexecuted trades from planned sales reported by insiders, to retest the information effects, and find the results remain robust across control for unfulfilled insider sales that might have confounding impact. [↑](#footnote-ref-10)