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Insiders' Profits in the Australian Equities Market

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Insiders' Profits in the Australian Equities Market

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Abstract

In this paper we investigate if directors of Australian companies earn persistent profits on their reported trades, if these abnormal profits are significant enough to be mimicked by outsiders, and if these insider trades have an effect on returns of other investors. We find that insiders take advantage of their private information in stocks of larger corporations, but generally do not in medium and small capitalization firms, indicating that they insiders are attracted to the liquidity and a greater presence of uninformed traders in large stocks. Insiders appear able to determine the value of their information in by trading larger volume and larger portion of their holdings when they have access to valuable information. We find that outsiders can make profitable trades by following insider's trades in large firms, but abnormal returns mimicking insiders in small and medium size firms are limited to insiders' sell trades only, and otherwise result in losses for outsiders. Implications on market fairness and integrity are discussed and conclude that market quality can be improved with public access to good quality aggregated data on reported director insider trades.

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1. Introduction

To assess the importance of insider trading in the Australian market, we investigate if directors earn profits on their reported insider trades, how they time these trades, and what the determinants of such trades are. Using the exact publication dates of these trades we assess whether outsiders are able to profit on this information. By presenting a comprehensive up-to-date analysis of insider trading profitability in Australia, this paper aims to provide fact based policy recommendation for how current insider trading regulation may be further improved.

Insider trading is well covered in the earlier literature, which generally focuses on the value of information contained in insider transactions. The literature typically differentiates between publicly reported insider trades and prosecuted illegal insider trades (Rogoff, 1964, Seyhun, 1986, Rozeff and Zaman, 1988, Meulbroek, 1992, Lakonishok and Lee, 2001). Early studies for Jaffe (1974) and Finnerty (1976) found significant abnormal returns on insider trades and suggested that these can be profitably imitated, which was later refuted by Seyhun (1986). Recent important contributions to the literature are Bhattacharya and Daouk (2002) who report global evidence that insider trading is a significant cost to outsider investors, Jeng, Metrick and Zechkhauser (2003) who find that the returns earned by insiders themselves are significant, Ravina and Sapienza (2010) who show in detail how directors outperform in their trading, and Cohen, Malloy and Pomorski (2012) who finds that focusing on non-routine "opportunistic" insider trades yield value-weighted abnormal returns of 82 basis points per month, while abnormal returns associated with routine insider trades are essentially zero.

In Australia Tomasic and Pentony (1991), Lyon and Du Plessis (2005) and several international law reviews of insider trading regulation, analyse insider trading from the legal perspective. Papers that investigate insider trading in Australia from the capital market perspective are Brown, Foo and Watson (2003), Hodgson and van Praag (2006), Uylangco, Easton and Faff (2010), McInish, Frino and Sensenbrenner (2011), Aspris, Foley and Frino

(2014) and Chang and Watson (2015). Results directly reporting performance of shares after insider rading are presented in the three of these papers. For data from 1996 to 2000, 1996-2003,and 2005 to 2007 respectively, Brown et.al (2003), Hodgson and van Praag (2006) and Uylangco, Easton and Faff (2010) show that insider directors' trades are followed by significant returns in the magnitude of 4% per annum, which in international context indicate that insider trading profits are at the expected level also in Australia (see our comparison across the literature in Table 7).

Recently the insider trading literature has gained momentum as a result of access to new datasets or innovations in methodology. Using detailed data from Nasdaq OMX in Finland Berkman, Koch and Westerholm, (2015a) find significant mean abnormal returns when corporate directors trade, either as an insider in their own company's stock, or as an outsider in other stocks. Important for our study they show that director trades contain information, and the degree of importance is dependent on how well the director is connected.

Mehta, Reeb, Zhao (2014) show US regulations prohibit a firm's employees from exploiting their private information about the firm and mandate that senior executives report their trades in their firm. Private information, however, often exhibits spillover effects and implications for a firm's customers, suppliers, and competitors labelled shadow trading. Important for our study they show that significant insider information often is conducted outside of the regulated channels of director trading.

Cukurova (2014) estimates what outside (non executive) directors learn around annual meetings using evidence from public SEC filings of insider trades in the USA. She shows that a significant proportion of price relevant information is released before the annual meetings through executive director trades, while all information revealed through outside director trades occurs after the annual meetings. For our purpose this is an important result showing how

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public records of director trades contain significant information, particularly once non-routine trades by executive directors are isolated.

Collin-Dufresne and Fos (2015) expand the literature to consider inside information of activist shareholders and show that inside information is hard to detect in transaction data as informed traders enter when the market is more liquid and use limit orders. They conclude that, when informed traders can select when and how to trade, standard measures of adverse selection may fail to capture the presence of informed trading. These results are important to our study as they show that insider trading tends to be focused to more liquid periods and securities when the insider has a strategic choice.

In this paper we investigate reported insider trades by corporate directors and entities of their direct influence and interest. This study aims to first verify previously observed returns following insider trades using comprehensive dataset from Australia for a relatively long period 2005 to 2015, and a relatively wide range of stocks (2094) compared to most previous studies. The sample also identifies discretionary trades from routine trades. Second we investigate if the reported legal insider trading by directors has a negative impact on the return of outside investors, and third we discuss if the current extent of the publication of insider trading is sufficient to deter abuse of inside information, and to give corresponding policy recommendations. We find that insiders take advantage of their private information in stocks of larger corporations. We find that outsiders can make profitable trades by following all insider's trades in large firms, but only by following insider sales in medium and small firms. A calendar-portfolio analysis shows that the insider buy portfolio outperforms before controlling for common risk factors; the average returns are positive and significant at 1% level across all stocks as well as different size groups. However, risk adjusted returns, alphas, are negative and significant suggesting that insider buy portfolio does not outperform across all stocks and different size groups when we take into account compensation for risk factors.

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There are some specific differences in the Australian data compared to international results. The results in this paper contributes to the literature by showing that in modern markets, with significantly lower transaction costs, insider profits are still significant, and appear possible to imitate. Hence inside information is incorporated into prices of Australian equities with a delay.

The outcomes presented in this paper emphasise that reported legal insider trading action has a significant impact on returns, and that investors and money managers need to pay close attention to the actions of corporate directors, particularly in larger firms where insider activity may be harder to detect. The results indicate that current Australian securities law and regulation is sufficient as insider directors generally report their trades on a timely basis, and also almost without exception conduct their trading outside of the windows when they are not allowed to trade. These findings also show that publicly reported insider trading can be better incorporated into investors' decision making as the information they disseminate is not instantly incorporated into prices, permitting those who pay attention to benefit from this information. Hence the current regulation of legal insider trading is appropriate, but the main policy recommendation of this study is that the reporting of these trades should be made more easily accessible in a well structured public database. In the United States for example such data is available directly from the SEC and aggregated in easily retrievable form by commercial data providers. This research required extensive cleaning and compilation of the current pdf records of insider trades to conduct an analysis of the aggregated results. At present it is not expected that many market participants have the resources so keep up to date records of cumulative insider trading activity in the Australian market. One off exchange announcements in isolation do not provide much information without a the context of previous actions of all insiders of the stock. There are however several competing considerations with suggesting publicly available insider trading data such as the protection of the privacy of insiders vs. the

hypothesised improvement in price discovery. At present the regulator can access the required information as the need arises, for example upon detection of suspicious activity, hence the regulator is able to deter illegal activity. This does not however mean that the information content in insider trades is reflected in prices without delay. As long as information about legal insider trading is difficult to track, this information is bound to be incorporate into prices very slowly.

The paper is organised as follows. Section 2 describes the unique data set from the ASX. Section 3 provides the results for profitability of insider trading for insiders. Section 4 presents the determinants of insider's abnormal returns. Section 5 discusses the outsider's abnormal profits, and section 6 concludes.

2. Data

2.1. Data on Insider Transactions and institutional background

In Australia shareholders that are classified as insiders (corporate directors, corporations where the director has an interest, director controlled trusts and immediate family members) are required to lodge a "Change in Director Interest Notice" or Appendix 3Y, with the ASX within 10 working days of a trade in securities or options of the firms where they are a director.[1] The directors are requested to report the following items (but do not always provide complete details): the trade date (report date is known from the date and reference number of each report), company trading code, the intentions of the trade, whether the interest is direct or indirect, initial, acquired, disposed and post-trade holdings are also reported. We hand collect this data

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[1] In Australia the term "insider" refers to directors under the Corporations Act (2001), where a director is defined in Section 9. As pointed out by Chang and Watson (2015) endnote 1 page 1, "the definition differs from the use of the term in the US where it includes officers, executives and large shareholders. In Australia, large shareholders are known as substantial shareholders and they report changes in their shareholdings separately."

using a procedure of machine reading the reports and manually verifying the correctness of the data. The items we require for a complete observation are trade date, report date, company trading code, insider ID, and volumes of purchase and sale of the insider trade. In this paper we include only insider transactions that are discretionary trades by the insider. This means that we do not include transactions related to purchase plans, dividend reinvestments plans, issues of performance rights, trades where shares are bought at a discount (option exercises) or sold at a premium (company buy backs). The sample initially consists of 31,344 trade transactions in 2094 different Australian firms during the period of December 8, 2005 to February 12, 2015. It includes trade date, report date, and volume of purchases and sales for all reported net transactions where an insider trades shares of her own firm.

We run the following filtering procedure to ensure our empirical procedure gives us reliable results:

1- We aggregate observations with same stock, same insider, same trade date and type of transactions.

2- We delete duplicate observations for an insider during the same day.

3- We delete buy transactions for same stocks, same dates but different insiders. The reason is that their purchase is very likely to be motivated by award system of the firm rather than insider information.

4- We delete transactions with less than 100 shares traded.

This filtering procedure leaves 21,387 transactions for our empirical tests.

2.2. Market Data

We obtain daily data on share trading (VWAP[2], share volume, dollar volume, time-weighted dollar spread, average trade size, buyer-initiated and seller initiated trade volume) from Australian Equities databases. We collect monthly total shares outstanding from Share Price and Price Relative (SPPR) databases. Both of these databases are provided by Securities Industry Research Centre of Asia-Pacific (SIRCA). These data sets are then merged with the Insider data set. Since we focus on daily returns and the insider records do not contain trades that are offset within the same trading day, using VWAP as the trade price is sufficient. We check if a stock has at least 50 non-missing price data 200 days prior to the trade date, at least 50 non-missing price data 200 days after the trade date, and no missing price data on the trade date. If an observation does not comply with these requirements, we exclude it from the sample. The sample now contains 19,710 insider-price data observations after applying this requirement.

Table 1 provides a breakdown of the characteristics of the director insider trading sample by market capitalisation of the insider firms. The first to the fourth columns in Table 1 presents descriptive statistics for director insider transactions in all, large, medium and small firms based on their market capitalisation. In order to classify the firms into different size categories, we rank all stocks at the beginning of the sample period, and assign the stocks into three size groups with an equal number of representative firms.

The average market capitalisation for the large, medium and small firm categories are 1.99, 0.45 and 0.0098 billion dollars, respectively. There is a total of 2,094 firms in the sample which represents roughly two-third of all Australian listed shares. The total number of open market

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[2]Volume Weighted Average Price (*VWAP*) is calculated as follows, where i denotes the trade and n is the total number of trades in the day: $VWAP = \frac{\sum_{i=1}^{n} volume_i \times price_i}{\sum_{i-1}^{n} volume_i}$. SIRCA reports this ratio for all stocks in its Australian Equities database.

purchases and sales by insiders is 21,387 for the complete sample and 8,504, 6,992 and 5,891 for large, medium and small firms, respectively, suggesting that the number on inside transaction is higher in larger stocks.

The ratio of insiders' purchases to sales is 1.6 for all, 0.75 for large, 1.69 for medium and 2.64 for small firms. These buy to sell ratios indicate (except for large stocks) that when insiders trade, they tend to buy more frequently than they sell, and the frequency of buys to sells decreases with the size of the firm. Interestingly, insiders in large firms sell more than they buy, possibly indicating more liquidity driven trading in large firms.[3]

We finally analyse the proportion of days with insider trades and the clustering of insider trades in the second part of Table 1. The proportion of insider trades to all trades in all stocks is 0.58%, with 0.47%, 0.73% and 0.64% in large, medium and small stocks, respectively. The results in Table 1 show that while insider trades are quite equally dispersed across time and in stocks, there are clear periods of higher concentration of director trades that analysts will wish to focus on. While some stocks experience a large number of insider trades, the average number of days per stock per year that insider trades is 3.1 days, and the number of trades each such day is 6.25.

3. Profitability of Insider Trading

In this section, we investigate whether the insiders earn significant abnormal profits on trades in their own firm stock. We analyse trading performance using two approaches: an event study approach and a portfolio calendar approach.

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[3] The sample include only discretionary non-routine trades by directors.

3.1. Event study approach

For each date with insider trades, we first allocate a firm to a buy or a sell portfolio based on the imbalance in trading volume by insiders. If the volume of buy (sell) transactions exceeds the volume of sale (buy) transactions on that day, the firm is assigned to buy (sell) portfolio. Insiders who buy as many shares as they sell are ignored. Then, we calculate the daily abnormal returns (ARs) for each stock in each size group as the actual daily returns minus the equally weighted return cross all stocks in the same size group (excluding the stock in the interest).

In order to investigate the performance of insiders after they trade their firm shares, we compute the cumulative average of abnormal returns (CAARs) for each insider over different short-term and long-term horizons, and then calculate the mean and median of these averages across all insiders. The t-statistics are based on the standard deviation of the average CAARs across all insiders. The short-term horizons are between day 1 to 5 (1,5), day 1 to 10 (1,10) and day 1 to 20 (1,20) after the trade date. The long-term horizons are between day 1 to 60 (1,60), day 1 to 120 (1,120), and day 1 to 250 (1,250) after the trade date. Table 2 reports mean, median, *t*-statistics and the number of insiders with at least one trade for buy and sale transactions and overall sample that includes both buy and sale trades across different size groups.

Table 2, panel A reports the results for all firms in the sample. Number of buy inside transactions (N=1,983) is greater than the number of sell transactions (N=951) across all firms. The mean CARs for buy transactions in short run is significant: the insiders accumulate 0.55% (*t*-statistics=2.43) after one week. However, their returns decrease over the longer horizons and they incur significant loss of 2.39% (*t*-statistics=2.87) after three months and 5.1% (*t*-statistics=1.91) after one year. The short-term significant abnormal return subsequent to insiders' purchases can be due to the market reacting to the good news implicit in insiders' purchases. In contrast, following their sell trades and over the short-term, the mean CAR is

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insignificant. Over the long-run CAR grows to -2.57% (*t*-statistics=2.7) after 3 weeks, -8.15% (*t*-statistics=-6.92) after 3 months, and -9.96% (*t*-statistics=-4.52) after 6 months. Insiders accumulate 11.42% (*t*-statistics=-1.84) after one year following their sell trade. Note that negative daily abnormal returns for sale transactions are imply positive returns for insiders as they show abnormal stock price declines following insider's sales.

We expect that if insiders buy (sell) stock prior to an announcement of favourable (unfavourable) information, then insider's purchases (sales) will be followed by positive (negative) abnormal returns. The results in table 2 indicate that insiders underperform after they purchase and outperform after they sell. This suggests that insiders tend to buy after announcing good news, but tend to sell their shares before unfavourable information about their firm becomes public. The mean CARs for overall sample that contains both buy and sale transactions decreases over time, and they are insignificant over all horizons.

Figure 1 shows the cumulative average of abnormal returns (CAARs) over 199 days before and up to 300 days after each event day for insider trades, separately for buy and sell portfolios. Panels A and B of Figure 1 demonstrate how the stock price declines for purchases and rise for sales after the insider trade date, confirming our previous results that insiders underperform (outperform) after their purchase (sale).

We expect that if insiders refrain from buying (selling) share until after unfavourable (favourable) information is announced, then insiders' purchases (sales) will be preceded by negative (positive) abnormal returns. Figure 1, panels A and B show that before the insider trade date, the stock price declines for purchases and rises for sales. This is consistent with the intuition that insiders tend to refrain from buying stock until after the bad news about their firm becomes public, and from selling stock until after good news is announced.

Table 2, panel B reports the cumulative returns for small market capitalisation firms. For insider buys, the mean CARs are insignificant in the short run. They decrease over the time

and become significantly negative in the long-run. Insiders in small firms incur loss of -2.25% (*t*-statistics=-2.69), 7.38% (*t*-statistics=-5.09) and 17.41% (*t*-statistics=-3.02) after 3 weeks, 3 months, and one year, respectively. In contrast, for sell transactions, insiders accumulate abnormal returns of -5.4% (*t*-statistics=-2.41), and -16.31% (*t*-statistics=-5.89), -15.3% (*t*-statistics=-2.32) after 3 weeks, 3 and 6 months, respectively.

The results in Table2, panel B, indicates that insiders tend to purchase after revealing good news, but tend to sell their shares before unfavourable information about their firm becomes public. The mean CARs for the overall sample is small in magnitude and significance over the short-term. However, they are significantly negative (both economically and statistically) 3 weeks, 3 and 12 months after the trade. The performance of insiders after their trade is very similar in panels A and B, indicating that results in Panel A is driven by small firms dominant in the Australian market.

Table 2, panel C reports the results for the medium market capitalisation firms. Following buy transactions, the mean CARs are significant in the short run, but decrease over time and become insignificant in the long run. An insider in a medium size firm on average accumulates 0.91% (*t*-statistics=3.09) and 0.86% (*t*-statistics=2.04) after one and two weeks, respectively. However, they incur a significant loss of -3.74% (*t*-statistics=-2.04) after 6 months. The short-term outperformance can be attributed to the good news implicit in insider's purchase. Long-tern loss indicates that insiders tend to purchase after revealing good news about their firm.

For sell transactions, the mean CARs decrease over time suggesting an increasing cumulative abnormal returns for the insider, but they only become significant after 3 months (-6.22% and *t*-statistics=-2.38) and 6 months (-10.21% and *t*-statistics=-2.46). This is similar to what we find for small firms where insiders make increasing abnormal profit in the long run, but not in the short term after they sell their own firm shares. This support the intuition that insiders in medium size firms, like small forms, tend to sell their shares before revealing

unfavourable information about their firm. The mean CARs for overall sample that contains both buy and sale transactions are insignificant, economically and statistically, in the short- and long-term for the medium size firms.

Table 2, panel D reports the results for insider transactions in large firms. Insiders in large firms accumulate increasing significant abnormal returns over time in both short- and long-run after their sell and buy transactions. For buy transaction, the insider accumulates 0.7% (t-statistics=3.28) abnormal returns one week after the trade and it grows to 1.9% (t-statistics=1.77) after three weeks. The mean CARs are 2.47% (t-statistics=2.00) and 2.34% (t-statistics=1.92) after 3 and 6 months, respectively, following the insider's purchase. These results are different to results for small and medium stocks for which the mean CARs is decreasing over time and insignificant and even negative in the long-run. The results suggests that insiders in large firms tend to buy before announcing good news to the public.

For sell transactions, mean CARs are decreasing and significant over the time suggesting that there is increasing positive abnormal returns for the insider following their sell transactions. The mean CARs is -0.87% (t-statistics=-3.75) after a week and they grow to -2.39% (t-statistics=-5.51), -5% (t-statistics=-4.89), -11.44% (t-statistics=-4.66) after 3 weeks, 3 months and one year following the transaction day, respectively. These results indicates that insiders tend to sell before announcing bad news. The results for the overall sample that includes all buy and sale transactions across large stocks show that insiders accumulate an increasing abnormal returns over time in their inside transactions. Their mean CARs changes from 0.64% (t-statistics=3.66) over one week to 5.19% (t-statistics=1.9) after one year following their transaction date.

The results for large firms are consistent to findings in prior research on insider trading (Seyhun, 1986; Jaffe, 1974; Jeng et al., 2003; Lakonishok and Lee, 2001 and Ravina and

Sapienza, 2010), in which there is abnormal returns for insiders after their buy and sale transactions.

In summary, the results in Table 2 show that insiders in large firms make abnormal profits in buying and selling their firm's shares over the short- and long-term. Insiders in small firms earn abnormal returns only in their sell transactions and after one month following their trade. Insiders do not profit from buy transactions in small firms. Insiders in medium size firms accumulate abnormal returns in their buy transactions up to 2 weeks (short-term), and in their sell transactions after 3 months (long-term) following their trade. This finding suggests that insiders in larger firms often take advantage of their private information more often compared to those in smaller firms in the Australian market. The possible explanation is that large firms have a larger proportion of uninformed traders or traders with liquidity needs that can act as counterparties to the insiders. In smaller and less liquid firms the insiders dominate the market and they are not able to profit as much from their information advantage.

3.2. Calendar time portfolio approach

In this section, we analyse the performance of insiders using a calendar time portfolio approach. At the beginning of each month, we allocate each stock into the insider buy (sale) portfolio if insiders for the particular stock are net buyer (seller) of that stock over the previous three months. We exclude the stock if the volume of buys and sales are equal. This allocation results in two portfolios based on insider trades over previous three calendar months. We keep the portfolios for one month and rebalance at the beginning of the next month. We calculate the equally weighted portfolio returns in each month for each portfolio. We compute portfolio time series average returns to analyse the monthly performance of these portfolios. We also estimate portfolio alphas, as the proxy for risk-adjusted insiders' performance, based on the Fama–

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French three-factor model and the Carhart (1997) four factor model. The results are tabulated in Table 3.

Panel A of Table 3 shows that the insider buy portfolio outperforms before controlling for common risk factors; the average returns are positive and significant at 1% level across all stocks as well as different size groups. However, risk adjusted returns, alphas, are negative and significant suggesting that insider buy portfolio does not outperform across all stocks and different size groups when we take into account compensation for risk factors. For example, the monthly Fama-French alpha (panel A, column 2) for all stocks in the sample is 28 basis points per month (t-statistics=-24.34). This average monthly underperformance corresponds to a loss of 3.4 percent per annum.

In contrast, the insider sale portfolio in panel B has significant negative monthly alphas across all stocks and different size groups, suggesting that the insider sale portfolio outperform after controlling for risk factors. The risk adjusted monthly returns, alpha, across all stocks for the sale portfolio (Panel B, column 2) is -33 basis points (*t*-statistics= 5.13) which is close to the monthly alphas for the insider buy portfolio (i.e., -28 basis points).

4.   Determinants of Insiders' Abnormal Profits

In this section, we investigate the source of insider's abnormal returns after they trade their own firms' stocks. We define CARs over the short-term period of 1 to 10 days (1,10) and 1 to 120 days (1-120), as the dependent variable in a set of regressions to examine if a group of independent variables can explain the abnormal returns for insiders. CARs are calculated for overall sample that includes both buys and sales. We use an OLS regression with fixed effects for insiders and firms. The independent variables are dummy variables for sales transactions, S, and the natural log of the daily close price, Log V, dollar volume of insider trading (defined as the product of VWAP and volume of shares traded by the insider) Log TV, and portion of

shares of the firms traded by insiders, Log PV. All the variables have been used in prior literature on insider trading to examine the determinants of superior predictive ability of insiders. (e.g. Jaffe, 1974; Seyhun, 1986).

Table 4-panel A reports the results of the regressions when the dependent variable is the cumulative daily average abnormal returns (CARs) over the window of (1,10) days after the insider trading day. There are six different regression models based on dependent variables employed in the regression. Model 1 in Table 4-panel A shows the regression estimation of CARs over 10 days after the trade on dummy variable for sales transactions. The slope of the dummy variables is positive and significant for small size group. This provides evidence that insiders in small firms cannot forecast future abnormal stock prices movements. They purchase stock prior to abnormal price falls and sell stock before abnormal price rises, indicating that they incur loss in their buy-sell transactions in short- and long-term. This is consistent with our results in Table 2, panel B (last column) that shows negative abnormal returns for insiders over the window of (1-10) and (1-120) days following their trade.

Model 2 in table3-panel A presents the results for the regression of CARs on the natural log of the daily close price of the firm. The results indicate that share price is negatively related to insiders' abnormal profit across all stocks as well as different size groups.

Model 3 in table 4-panel A reports the results for the estimation of the regression of CARs on the natural log of the dollar value of insider trades. The estimates for small stocks are positive (0.004) and significant (*t*-statistics=1.94) indicating that insider abnormal returns increase with the log of the dollar value of the transactions.

Model 4 in table 4-panel A uses the natural log of the proportion of the shares of the firm traded by insiders. The results indicate a positive relation between the insiders' abnormal returns and the log of proportion of the firm traded in both small and large firms. Models 3 and

4 suggest that insiders trade larger dollar volume (in small firms) or higher percentage of shares (in both small and large firms) to exploit more valuable information.

Model 5 uses the natural log of the dollar value of insider trades and the natural log of stock price as explanatory variables. The coefficient of the dollar value of trading becomes significantly positive for large stocks and stronger for small stocks, while the coefficient of share price remains significantly negative. Including frim size increases the significance of the dollar value of trading, indicating that insiders respond to more valuable information by trading a greater dollar volume of stock.

Model 6 provides the results of the regression of CARs on the natural log of the proportion of the firm traded and log of firm size. Once again, the proportion of the firm traded is positively related to insider's abnormal returns, while firm size is negatively related to insider's abnormal profits in both large and small stocks.

Panel B, in table 4 provides the results for the determinants of the insider abnormal returns over the long term i.e. 120 days after they trade. The estimates in panel B is stronger than those in panel A. The slope of the sale dummy variable (Model 1) is positive and significant for all size groups, providing evidence that insiders in all firms cannot forecast future abnormal stock prices movements in the long-run.

Model 2 in table 4-panel B shows that share price is negatively related to insiders' abnormal profit across all stocks as well as different size groups over the long run. This is similar to our findings in panel A.

The coefficients for trade volume and proportion of shares traded in models 5 and 6 are significantly positive after controlling for the stock price across all stocks and different size groups. The exception is for the medium size stocks, where the proportion of trade is insignificant even after controlling for price. This finding suggests that insiders respond to

more valuable information by trading greater dollar volume of stock or higher proportion of their share.

The results in panel A and B are summarized as follows. First, there is a significant negative relationship between insider abnormal returns and firm equity price. This suggests that the most profitable insider trades occur in low value firms. Second, insiders appear able to determine the value of their information in the long-run by trading a larger volume of stocks or larger portion of their shares when they have access to valuable information.

5.　Outsiders' Abnormal Profits

In this section, we examine the availability of abnormal returns to outsiders following the day that insider reports their trades to the ASX. This is also the date that insider trades become publicly available. According to the legislation in Australia, insiders must report their trade within 10 days after their transaction.

We compute the total number of inside transactions for overall sample categorised by the number of calendar days between the insider trading day and the report date (i.e. number of days insiders delay to submit their reports). Then we investigate the extent that insiders in Australia follow the legislation and how much they earn during the time that their trades have not yet been public.

Table 5 presents the results for firms in different market capitalisation categories. The results show that most of insiders report their transactions (about 60% of total transactions) less than 3 days after they trade. More than 90% of transactions in each size group are reported in the first week following the trade, suggesting that information about the majority of insider trades in Australia becomes public in a week.

Table 6 reports the cumulative daily average abnormal returns over different time frames after insider trades become public. This is the cumulative returns for outsiders if they follow

insider trades, i.e. they buy (sell) following the news about insider purchase (sell) becomes available.

The results for buy transactions of outsiders in panels A, B and C of Table 6, show that outsiders incur loss if they follow insider's purchase in all firms (panel A) as well as small (panel B) and medium (panel C) size group firms in short- and long-term. However, for large stocks, they earn from 1.02% (t-statistics=1.84) 2 weeks following their trade up to 1.88% (t-statistics=1.78) and 2.32 % (t-statistics=1.82) 3 and 6 months, respectively, after they purchase stocks.

The results for sale transactions across all stocks and size groups (panels A, B and C in Table 6) show that outsiders make profit over all window periods after they sell following public announcement of insider's sale. However, the abnormal return after a year for small and medium size stocks is statistically insignificant.

The results over all transactions (buy and sell) for small stocks (panel B, Table 6) show that there is a loss for outsiders after 3 and 12 months if they follow insider's transactions in small firms. However, outsiders who follow insiders in large stocks earn an increasing abnormal return from 0.29% (t-statistics=1.79) after a week up to 5.3% (t-statistics=1.91) after one year following the insider report date.

In summary, outsiders can make profitable trades by following insider's trades in large firms, but the abnormal returns of doing transactions following insiders in small and medium size firms are limited to insider's sale trades.

Results in Table 2 (gain for insiders) and Table 6 (gain for outsiders) are not readily comparable across all window periods except for the period of 1 to five (1,5) days. The reason

is that most of the insiders report their trade in the first week after their trade. Therefore, the abnormal returns for insider over later periods include the abnormal returns for outsiders.[4]

Comparing Tables 2 and 5 for the period of one to five days reveals interesting results. Table 1, panel A shows that while the insider earns abnormal return one week after their purchase, outsider gets nothing over a week if she follows the insider. This is vice versa for the sale transactions. While insider's abnormal return one week after their sale is insignificantly different from zero, it is significant for outsiders: they earn 1.09% (*t*-statistics=-2.71) one week after their transaction. But the results over all transactions (last column in panels A of Tables 2 and 5) show that neither insider nor outsider earn profit one week after their transactions.

However, the results for large stocks indicate that both outsiders and insiders profit one week following their buy *and* sale transactions. The results for buys and sales (last column, Panel D, Table 2 and 5) show that insiders' abnormal return is *higher*, statically and economically, than that of outsiders. Insider's accumulated abnormal return after one week is 0.64% (*t*-statistics=3.66), while the profit for outsiders is 0.29% (*t*-statistics=1.79) after one week. Ten days following the insider's trade, the accumulated abnormal return is 1.05 % for both insiders (Table 2) and outsiders (Table 6), suggesting that over this period, the inside information is available to all market participants.

6.   Contrasting our results to previous studies and policy recommendation

Seyhun (1986) finds that insider trading profits are not significant after transaction costs in the US, Collin-Dufresne and Fos (2015) conclude that, when informed traders can select when and how to trade, standard measures of adverse selection may fail to capture the presence of informed trading. Meanwhile previous studies as well as the present one shows that in Australia

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[4] Note that we have used VWAP as a proxy for trade price for both insiders and outsider.

insider trades do contain significant information that is reflected in prices with a delay. Table 7 indicates that the profits of insider trade lies persistently at just above 4% for large stocks, while they may be significant and large on insider sales in medium and small capitalisation stocks. With more accessible reporting we predict that the information contained in director insider trades would be more quickly reflected in prices, markets would become more efficient, and the currently highly significant autocorrelation in prices in most markets including Australia, would decrease or disappear. This may however come at the cost of the privacy of individuals with insider status coupled with costs of maintaining a public database of aggregated insider transactions, and there are limits to how much normative prescriptions the regulator can and should put in corporate executives.

7. Conclusions

In this paper we investigate if directors of Australian companies earn persistent profits on their insider trades and if these abnormal profits are significant enough to be mimicked by outsiders.

We find that insiders take advantage of their private information in stocks of larger corporations. We find that outsiders can make profitable trades by following all insider's trades in large firms, but only by following insider sales in medium and small firms. There are some specific differences in the Australian data compared to international results. When we compare our results to the results of Seyhun (1986) we find similar level of statistical and economic significance and difference between large and small stocks. One of the main results from Seyhun (1986) was that after transaction costs, outside investors could not make profits on their information about insider trades. The results in this paper contributes to the literature by showing that in today's equity markets, with significantly lower transaction costs and higher turnover rates, insider profits are still significant, and inside information is still incorporated

into prices of Australian equities with a delay. Our results also support Jeng, Metrick and Zechkhauser (2003), who find that the returns earned by insiders themselves are significant when close attention is paid to measuring these appropriately. Finally we extend the findings in previous Australian research into the most recent years (Brown, Foo and Watson (2003), Hodgson and van Praag (2006) and Uylangco, Easton and Faff (2010)).

The outcomes presented in this paper emphasise that reported legal insider trading action has a significant impact on returns, and that investors and money managers need to pay close attention to the actions of corporate directors, particularly in larger firms where insider activity may be harder to detect. Investors and regulators can conduct an analysis similar to ours using real time data by updating their database on insider trading with from the public records.

Future research (and future extensions of this paper) can further contribute to our understanding of the impact of transaction costs, both explicit (fees) and implicit (bid-ask spreads and market impact) on insider performance. The purpose of such analysis would further validate our finding that insider trading profits are still of sufficient significance and persistence to be beneficial for those who follow insiders. The results presented in this paper will be particularly useful for investors that wish to increase the quality of the information used in their investment allocation and timing decisions. The results are also important for regulators promoting a market with the highest possible level of informed prices. A market that optimises the way information is reflected in prices is in our view a more liquid and resilient market with higher integrity and fairness.

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Figure 1
Cumulative Daily Average Abnormal Returns around the Insider Trading Day

This figure presents the cumulative daily average abnormal returns (CAARs) from 199 days before to 300 days after the insider trading day for a portfolio that consists 2094 firms traded by insiders during 2005/12/08 to 2015/02/12. The CARs are separated by sale and buy transactions as well as overall sample that includes both buy and sale transactions, and illustrated for all stocks, small, medium and large stocks. For the overall sample (which includes both buy and sell transactions), the abnormal returns for sales are multiplied by minus one before averaging across all transactions to compute CAARs.

Panel A: CAARs for buy transactions   Panel B: CAARs for sale transactions

Panel C: CAARs for overall sample (buy and sale transactions)
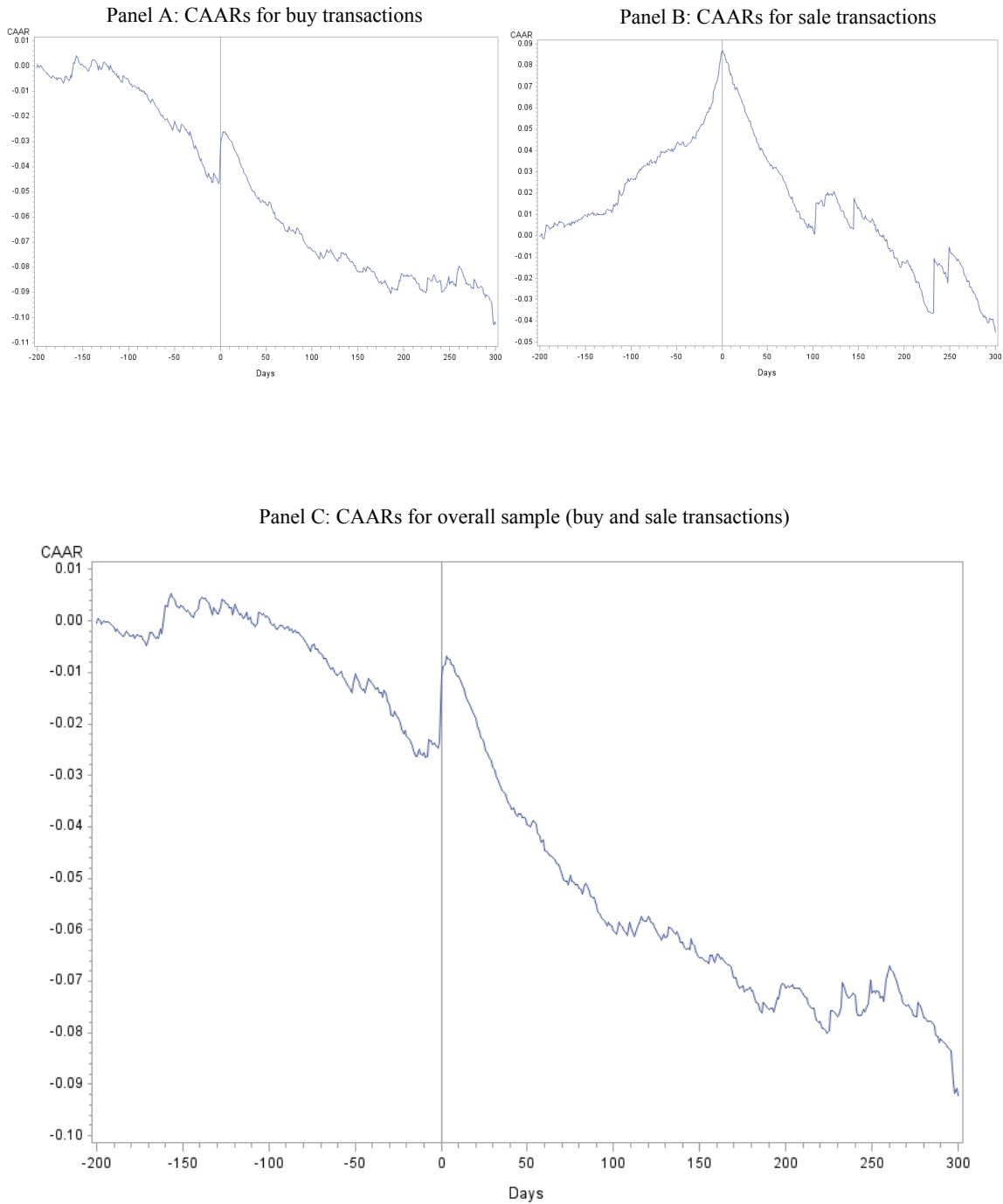
Table 1
Summary Statistics

This table reports cross-sectional average summary statistics for the sample of director insider trades in their own firm stock on the ASX from 2005/12/08 to 2015/02/12 and comparable market statistics for the same period (Total volume of shares traded in the market).

Director Insider Trades	All	Large	Medium	Small
Market Capitalisation-Mean (in $million)	682.4	1992.5	44.9	9.8
Market Capitalisation-Median (in $million)	38.51	336.27	38.51	9.63
Number of firms	2,094	698	698	698
Number of insider transactions	21,387	8,504	6,992	5,891
Proportion of insider transactions	100%	39.8%	32.7%	27.5%
Ratio of buy to sale insider transactions	1.6	0.75	1.69	2.64
Market Related Statistics				
Total number of transactions in the market	3,702,817	1,811,064	964,261	927,492
Proportion insider trades to all trades	0.58%	0.47%	0.73%	0.64%
Days with insider trades per year per stock				
Mean	3.10	3.23	3.07	2.94
Min	1	1	1	1
Max	40	40	33	32
Number of insider trades on above days				
Mean	6.25	6.26	6.51	5.91
Min	1	1	1	1
Max	40	40	33	32

Table 2
Performance of Insiders (Cumulative daily Average Abnormal Returns)

This table reports the mean and median of cumulative average abnormal returns (CAARs) over different time frames after insiders trade shares of their own firm and across different size groups. In each panel, first (second) column present the characteristics of CAARs after insiders buy (sell). Third column reports the CAARs for the overall sample of transactions that includes both buy and sale. The whole sample consists 2094 firms traded by insiders during 2005/12/08 to 2015/02/12.The t-statistics are computed using Newey-West (1987) method with four lags. *, **, *** indicate significances at the 10%, 5% and 1% level, respectively.

Panel A: All Stocks

Event period	CARs (Buy)				CARs (Sell)				CARs (Overall Sample)	
	Mean	t-stat	Median	N	Mean	t-stat	Median	N	Mean	t-stat
(1,5)	0.0055**	2.43	-0.0011	1983	-0.004	-0.5	-0.0109	951	0.0026	0.67
(1,10	0.004	1.37	-0.0053	1983	-0.0072	-0.8	-0.0193	951	0.0022	0.51
(1,20)	-0.0052	-1.28	-0.0145	1983	-0.0257***	-2.7	-0.0288	951	-0.0043	-0.87
(1,60)	-0.0239***	-2.87	-0.0472	1982	-0.0815***	-6.92	-0.0833	948	-0.013	-1.56
(1,120)	-0.0277	-1.48	-0.0802	1963	-0.0996***	-4.52	-0.1279	932	-0.0137	-0.76
(1,250)	-0.051*	-1.91	-0.1348	1909	-0.1142*	-1.84	-0.2041	892	-0.0356	-1.41

Panel B: Small Stocks

Event period	CARs (Buy)				CARs (Sell)				CARs (Overall Sample)	
	Mean	t-stat	Median	N	Mean	t-stat	Median	N	Mean	t-stat
(1,5)	0.0004	0.07	-0.0084	665	-0.0193	-1.26	-0.0222	233	0.0012	0.21
(1,10	-0.0074	-1.13	-0.0188	665	-0.0127	-0.63	-0.0374	233	-0.0065	-0.93
(1,20)	-0.0225***	-2.69	-0.0421	665	-0.054**	-2.41	-0.0736	233	-0.0177**	-2.08
(1,60)	-0.0738***	-5.09	-0.1106	665	-0.1631***	-5.89	-0.1868	231	-0.0519***	-3.73
(1,120)	-0.0677	-1.32	-0.1945	662	-0.153**	-2.32	-0.3129	226	-0.0485	-0.98
(1,250)	-0.1741***	-3.02	-0.3402	640	-0.0905	-0.53	-0.4540	212	-0.1593**	-2.56

Table 2, continued

Panel C: Medium Stocks

Event period	CARs (Buy)				CARs (Sell)				CARs (Overall Sample)	
	Mean	t-stat	Median	N	Mean	t-stat	Median	N	Mean	t-stat
(1,5)	0.0091***	3.09	0.0019	666	0.0137	0.63	-0.0112	308	0.0002	0.02
(1,10)	0.0086**	2.04	-0.0032	666	0.0064	0.28	-0.0214	308	0.0027	0.27
(1,20)	-0.0073	-1.27	-0.0199	666	-0.0066	-0.28	-0.0385	308	-0.009	-0.86
(1,60)	-0.0159	-0.94	-0.0590	665	-0.0622**	-2.38	-0.1107	307	-0.0077	-0.43
(1,120)	-0.0374**	-2.04	-0.0984	660	-0.1021**	-2.46	-0.1775	301	-0.0165	-0.84
(1,250)	-0.0264	-0.59	-0.1676	642	-0.1315	-0.91	-0.3372	285	0.001	0.03

Panel D: Large Stocks

Event period	CARs (Buy)				CARs (Sell)				CARs (Overall Sample)	
	Mean	t-stat	Median	N	Mean	t-stat	Median	N	Mean	t-stat
(1,5)	0.007***	3.28	0.0019	652	-0.0087***	-3.75	-0.0085	410	0.0064***	3.66
(1,10)	0.0146**	2.2	0.0004	652	-0.0143***	-4.38	-0.0142	410	0.0105***	3.19
(1,20)	0.019*	1.77	-0.0081	652	-0.0239***	-5.51	-0.0186	410	0.0142**	2.41
(1,60)	0.0247**	2	-0.0089	641	-0.05***	-4.89	-0.0521	410	0.0216**	2.22
(1,120)	0.0234*	1.92	-0.0094	641	-0.068***	-4.21	-0.0724	405	0.0251**	2.38
(1,250)	0.0494	1.58	-0.0141	627	-0.1144***	-4.66	-0.1111	395	0.0519*	1.9

Table 3
Performance of Insiders (Calandar Time Portfolio Retruns)

This table reports the monthly performance of buy and sale portfolios constructed based on net trade of insiders over the prior three months. At the beginning of each month, we assign each stock into the insider buy (sale) portfolio if insiders for the particular stock are net buyer (seller) of that stock over the previous three months. We calculate the equally weighted portfolio returns in each month and rebalance the porftfolios on monthly basis. Ave Return is the time series average returns of portfolios. Fama–French Alpha and Carhart Alpha are the intercepts estimated from the time-series regression of portfolio returns against the Fama–French three factors and also the four factors comprising the three Fama–French factors and the Carhart (1997) momentum factor, respectively. All values are in percentage. T-statistics are in parentheses and adjusted for HAC using Newey-West (1987) method with four lags. *, **, *** indicate significances at the 10%, 5% and 1% level, respectively.

Size Group	Buy Portfolio			Sell Portfolio		
	Ave Return	Alpha		Ave Return	Alpha	
		Fama-French	Carhart		Fama-French	Carhart
All stocks	0.11***	-0.28***	-0.28***	0.09	-0.33***	-0.32***
	(9.93)	(-24.34)	(-24.41)	(1.47)	(5.13)	(-5.03)
Small	0.19***	-0.19***	-0.19***	0.02**	-0.28***	-0.27***
	(7.77)	(-7.74)	(-7.86)	(2.06)	(-5.22)	(-5.08)
Medium	0.10***	-0.30***	-0.30***	0.03	-0.37***	-0.37***
	(94.40)	(-13.65)	(-13.65)	(1.12)	(-13.94)	(-13.95)
Large	0.06***	-0.32***	-0.32***	0.10**	-0.38***	-0.37***
	(4.28)	(-23.48)	(-23.56)	(2.29)	(-29.57)	(-29.38)

Table 4
Determinants of Insiders Performance

This table reports the determinants of daily cumulative abnormal returns after insider trades. The independent variables are dummy variables for sales transactions, S, the natural logarithm of the daily close price of the firm, Log V, the log of dollar volume of insider trading (defined as the product of VWAP and volume of shares traded by the insider) Log TV, and the log of the portion of shares of the firms traded by insiders, Log PV. T-statistics reported in parenthesis are computed using Newey-West (1987) method with four lags. *, **, *** indicate significances at the 10%, 5% and 1% level, respectively.

Panel A: Determinants of Cumulative Abnormal Returns in Short-run (10 days after the trade)

Size Group	Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
All Stocks	Intercept	0.0020	-0.0086***	-0.0031	0.0302***	-0.0349***	0.0192***
		(1.27)	(-4.77)	(-0.41)	(4.33)	(-4.26)	(2.59)
	S	0.0103**					
		(2.14)					
	LogV		-0.0167***			-0.0182***	-0.0128***
			(-9.37)			(-9.91)	(-6.26)
	LogTV			0.0008		0.0025***	
				(1.05)		(3.28)	
	LogPV				0.0035***		0.0030***
					(4.12)		(3.41)
Large Stocks	Intercept	0.0062***	0.0170***	0.0034	0.0198***	0.0017	0.0305***
		(4.29)	(8.48)	(0.42)	(2.61)	(0.22)	(3.87)
	S	0.0030					
		(0.82)					
	LogV		-0.0140***			-0.0151***	-0.0130***
			(-6.29)			(-6.60)	(-5.17)
	LogTV			0.0003		0.0015**	
				(0.46)		(1.98)	
	LogPV				0.0014*		0.0014*
					(1.78)		(1.77)
Mid-Cap Stocks	Intercept	0.0043*	-0.0144***	0.0128	0.0251*	-0.0275	0.0033
		(1.80)	(-2.74)	(0.80)	(1.73)	(-1.50)	(0.19)
	S	0.0108					
		(1.34)					
	LogV		-0.0146***			-0.0153***	-0.0108***
			(-4.48)			(-4.53)	(-2.72)
	LogTV			-0.0006		0.0012	
				(-0.37)		(0.74)	
	LogPV				0.0026		0.0016
					(1.33)		(0.74)
Small Stocks	Intercept	-0.0073*	-0.0619***	-0.0383**	0.0628***	-0.1322***	0.0277
		(-1.69)	(-5.54)	(-2.03)	(3.73)	(-5.46)	(1.19)
	S	0.0367*					
		(1.94)					
	LogV		-0.0228***			-0.0260***	-0.0145***
			(-5.51)			(-6.14)	(-3.09)
	LogTV			0.0040*		0.0069***	
				(1.94)		(3.25)	
	LogPV				0.0108***		0.0107***
					(4.47)		(4.06)

Panel B: Determinants of Cumulative Abnormal Returns in Long-run (120 days after the trade)

Size Group	Variables	Model					
		1	2	3	4	5	6
All Stocks	Intercept	-0.0450***	-0.1549***	-0.0576	0.1168***	-0.3459***	0.0384
		(-6.89)	(-15.99)	(-1.44)	(3.83)	(-7.99)	(1.17)
	S	0.1135***					
		(5.58)					
	LogV		-0.1565***			-0.1647***	-0.0964***
			(-16.33)			(-16.81)	(-10.48)
	LogTV			0.0027		0.0179***	
				(0.68)		(4.53)	
	LogPV				0.0202***		0.0184***
					(5.43)		(4.77)
Large Stocks	Intercept	0.0059	0.0906***	-0.0189	0.1168***	-0.0324	0.1963***
		(1.06)	(11.89)	(-0.63)	(4.06)	(-1.10)	(6.57)
	S	0.0400***					
		(2.87)					
	LogV		-0.1083***			-0.1154***	-0.0977***
			(-12.69)			(-13.52)	(-10.14)
	LogTV			0.0028		0.0115***	
				(1.06)		(4.23)	
	LogPV				0.0112***		0.0111***
					(3.65)		(3.60)
Mid-Cap Stocks	Intercept	-0.0517***	-0.2829***	-0.0470	0.0640	-0.5203***	-0.1247**
		(-3.93)	(-9.40)	(-0.51)	(1.34)	(-4.99)	(-2.21)
	S	0.1936***					
		(4.35)					
	LogV		-0.1750***			-0.1824***	-0.0986***
			(-9.28)			(-9.43)	(-7.45)
	LogTV			0.0016		0.0225**	
				(0.17)		(2.41)	
	LogPV				0.0156**		0.0096
					(2.43)		(1.40)
Small Stocks	Intercept	-0.1110***	-0.5929***	-0.1382	0.2182**	-0.8592***	0.0169
		(-7.23)	(-9.37)	(-1.30)	(2.34)	(-6.28)	(0.12)
	S	0.2280***					
		(3.40)					
	LogV		-0.1880***			-0.2001***	-0.0877***
			(-7.97)			(-8.26)	(-3.09)
	LogTV			0.0038		0.0261**	
				(0.32)		(2.20)	
	LogPV				0.0525***		0.0587***
					(3.94)		(3.78)

Table 5
Number of Insider's Transactions before Reporting to ASX.

This table reports the number of insider's transactions (buy and sale) from 2005/12/08 to 2015/02/12, grouped by the number of calendar days between the insider trading day and the day that insider's reports are received by ASX and immediately becomes public. The number of transactions is presented in size groups. The percentage of total number of transactions in each size category is reported in brackets.

Size Group	Total number of transactions	Number of transactions from trade day to report day				
		Delay less than or equal to 3 days	Delay between 3 and 5 days	Delay between 5 and 7 days	Delay between 7 and 10 days	Delay more than 10 days
All Stocks	21,387	12,650	3,845	3,135	463	1,294
		[59%]	[18%]	[15%]	[2%]	[6%]
Large Stocks	8,504	4,951	1,531	1,387	168	467
		[58%]	[18%]	[16%]	[2%]	[6%]
Medium Stocks	6,992	4,241	1,239	913	168	431
		[61%]	[18%]	[13%]	[2%]	[6%]
Small Stocks	5,891	3,458	1,075	835	127	396
		[59%]	[18%]	[14%]	[2%]	[7%]

Table 6
Gain (Loss) of Outsiders after Insider's Report Submitted to ASX

This table reports daily average of cumulative abnormal returns for outsiders after the insider's trades become public. The t-statistics are computed using Newey-West (1987) method with four lags. *, **, *** indicate significances at the 10%, 5% and 1% level, respectively.

Panel A: All Stocks

Event period	CARs (Buy)				CARs (Sell)				CARs (Overall Sample)	
	Mean	t-stat	Median	N	Mean	t-stat	Median	N	Mean	t-stat
(1,5)	-0.0003	-0.21	-0.0045	1993	-0.0109***	-2.71	-0.0099	954	0.0023	1.46
(1,10)	-0.002	-0.73	-0.0087	1993	-0.0185***	-4.01	-0.0194	954	0.0012	0.44
(1,20)	-0.009**	-2.32	-0.0176	1993	-0.0362***	-6.56	-0.0261	954	-0.0021	-0.59
(1,60)	-0.0251***	-2.97	-0.0483	1991	-0.0875***	-9.59	-0.0784	952	-0.0092	-1.17
(1,120)	-0.0327*	-1.75	-0.0820	1973	-0.1027***	-5.07	-0.1298	934	-0.0127	-0.71
(1,250)	-0.0483*	-1.81	-0.1356	1919	-0.122**	-2	-0.2089	896	-0.0266	-1.06

Panel B: Small Stocks

Event period	CARs (Buy)				CARs (Sell)				CARs (Overall Sample)	
	Mean	t-stat	Median	N	Mean	t-stat	Median	N	Mean	t-stat
(1,5)	-0.0028	-0.72	-0.0123	670	-0.0202	-1.38	-0.0191	231	0.0022	0.59
(1,10)	-0.0123**	-2.46	-0.0251	670	-0.0392**	-2.53	-0.0466	231	-0.006	-1.32
(1,20)	-0.0234***	-3	-0.0450	670	-0.0796***	-4.48	-0.0829	231	-0.0103	-1.41
(1,60)	-0.0709***	-4.57	-0.1194	670	-0.1685***	-6.93	-0.1957	230	-0.0448***	-3.08
(1,120)	-0.0722	-1.43	-0.1985	666	-0.1458**	-2.26	-0.2892	224	-0.0491	-1.01
(1,250)	-0.1631***	-2.85	-0.3204	644	-0.1003	-0.6	-0.4394	211	-0.1436**	-2.33

Table 6, continued

Panel C: Medium Stocks

Event period	CARs (Buy)				CARs (Sell)				CARs (Overall Sample)	
	Mean	t-stat	Median	N	Mean	t-stat	Median	N	Mean	t-stat
(1,5)	-0.0006	-0.22	-0.0056	669	-0.01*	-1.95	-0.0145	309	0.0018	0.77
(1,10)	-0.0037	-1.05	-0.0112	669	-0.0131*	-1.83	-0.0241	309	-0.0006	-0.18
(1,20)	-0.0157***	-2.86	-0.0225	669	-0.0278***	-3.2	-0.0297	309	-0.0078	-1.5
(1,60)	-0.0222	-1.32	-0.0587	668	-0.0894***	-5.51	-0.1101	308	-0.0025	-0.16
(1,120)	-0.0472**	-2.5	-0.0975	664	-0.1231***	-3.6	-0.1770	302	-0.0136	-0.77
(1,250)	-0.0283	-0.63	-0.1764	646	-0.15	-1.06	-0.3343	286	0.0112	0.35

Panel D: Large Stocks

Event period	CARs (Buy)				CARs (Sell)				CARs (Overall Sample)	
	Mean	t-stat	Median	N	Mean	t-stat	Median	N	Mean	t-stat
(1,5)	0.0024	1.33	0.0001	654	-0.0064***	-2.96	-0.0048	414	0.0029*	1.79
(1,10)	0.0102*	1.84	0.0010	654	-0.0109***	-3.54	-0.0095	414	0.0105**	2
(1,20)	0.0128*	1.96	-0.0041	654	-0.0184***	-4.27	-0.0174	414	0.0122**	2.07
(1,60)	0.0188*	1.78	-0.0056	653	-0.041***	-4.12	-0.0441	414	0.0204**	2.11
(1,120)	0.0232*	1.82	-0.0108	643	-0.064***	-4.01	-0.0667	408	0.0259**	2.34
(1,250)	0.0487	1.54	-0.0225	629	-0.1133***	-4.69	-0.0948	399	0.053*	1.91

Table 7

Summary of the Literature on Insider Trading Returns

This table reports a comparison across major international studies and all Australian studies with comparable results. We report the average abnormal annual return for insider purchases, i.e. the average return on the stocks above the market over one year after an insider trade was reported.

*) we have implied this combined effect from their reported executive and independent director returns, **) buy portfolio following director trades based on accounting accruals, ***) abnormal returns over 10 days post director trade, ****) for large stock sample

Summary of Studies of Insider Trading Returns

Authors	Publication Year	Data Sample	Market	Main Finding Abnormal Annual Return Insider Purchases	Interpretation
Jaffe	1974	1962-1968	US	7.0%	Significant
Finnerty	1976	1969-1972	US	4.8-8.3%	Significant
Seyhun	1985	1975-1981	US	4.3%	Not Significant
Jeng, Metrick and Zechkhauser	2003	1976-1996	US	6.0%	Significant
Ravina and Sapienza	2010	1986-2003	US	12.8%*)	Significant
Brown, Foo and Watson	2003	1996-2000	Australia	4.4%	Not Significant
Hodgson and van Praag	2006	1996-2003	Australia	4.3%**)	Significant
Uylangco, Easton and Faff	2010	2005-2007	Australia	0.4%***)	Significant
Berkman, Bradrania, Viljoen and Westerholm	2016	2005-2015	Australia	4.9%****)	Significant