# ARE INSIDER TRADES PROFITABLE? EVIDENCE FROM DIRECTORS' TRADE ON THE AUSTRALIAN STOCK EXCHANGE

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**Abstract**

This paper argues that directors earning statistically significantly abnormal returns from trades within their own companies. Evidence is provided through the analysis of 8,053 transactions by directors on the Australian Stock Exchange during the period of January 2002 to April 2006. Specifically this paper finds directors' sales to be more profitable than purchases, contrary to much of the existing US and UK research. Director sales exhibit a price reversal effect, in that positive abnormal returns are earned prior to the sale and negative returns after it. There is also evidence to support abnormal returns being associated with buy trades, however these returns are generally earned in the periods well after the transaction has taken place. Furthermore, the profits arising from director trades appear to be negatively related to transaction value and firm size; that is, those trades which are small in terms of dollar value, and are within small cap companies, generally generate larger abnormal returns.

**Keywords:** event study, insider trade, directors' trading, efficient market hypothesis, Australian Stock Exchange, company governance

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## I. Introduction

Insider trading can be defined as trading by individuals with information superior to that possessed by the market. Inside information, under s1042A of the Corporations Act 2001 is defined as, '*information that is not generally available and if the information was generally available, a reasonable person would expect it to have a material effect on the price or value of the particular financial product*'. While this definition does not specifically identify directors as holders of insider information, a number of regulations exist in Australia that require company directors to disclose trades within their own organization[1]. This provides us with a unique opportunity to test the information content of such trades and allows us to determine whether directors are thereby making abnormal returns.

Despite regulations both in Australia and overseas which force directors to disclose their trades, many empirical studies have concluded that in their trades, directors do outperform the market. A limited number of Australian studies exist which examine the profitability of director trades on the Australian Stock Exchange (ASX). Thus the aim of this study is to examine the profitability of directors' buy and sell transactions in their own companies by calculating the cumulative abnormal return (CAR) on these trades. It will also test for a firm size effect, which is in line with existing literature that found directors of small firms tend to make larger abnormal returns on their trades. Furthermore we will test for a relationship between the size of a director's trade in dollar value terms and the profits generated from such transactions.

The motivation for this research is drawn from several considerations. As stated above, there is a lack of recent research in Australia examining the trading activity of directors on the ASX. This paper aims to fill this gap by utilizing Australian data to test whether directors generate abnormal returns in the Australian market. Second, the topic of insider trading has attracted wide media coverage as a result of recent high profile insider trading cases[2]. Given this current attention, it is now timely to test whether directors are 'beating the market'. Finally, there also appears to be a market for director trade information. For instance, the Australian Financial Review regularly reports significant trades by directors in their weekly "Directors' Disclosures" section and data suppliers, such as Aspect Huntley, have recently started to sell this Australian data to investors and institutions alike. The commercialization of such information may indicate there is lucrative content associated with such disclosures.

[1] See next section for director trading regulation in Australia.

[2] These have included the late Rene Rivkin, Steve Vizard and more recently, the investigation of insider trading by Citibank employees.

The combination of the somewhat recent availability and commercialization of such data in the Australian market, and the lack of empirical studies utilizing Australian data, suggest that such a study on the Australian Stock exchange (ASX) was timely.

## II. Literature Review

Historically much research into the trading activity of directors has been conducted in the US, Canada and the UK. A number of studies have highlighted the importance of transaction cost in profitability of directors' trade (Jaffe's 1974, Rozeff & Zaman 1988 Gergory, and Matatko &Tonks 1997). These studies found that directors earn abnormal return by trading in their own companies' shares. However, after taking (round trip) transaction costs into account, the abnormal return becomes zero or negative, indicating that directors may not be able to profit from insider trade.

Ke, et. al (2003), and Wisniewski (2004), have investigated the timing of trades by directors. They found that directors exploit their foreknowledge of accounting disclosures to buy or sell their own shares, but cease trading in the period immediately before the publication date to avoid the appearance of illegal trading. These results imply that regulators may need to look at extending trading black out periods, because director trades have valuable informational content well before a significant event.

Lakonishok & Lee (2001) found in aggregate, insiders, including directors, tend to be contrarian investors with respect to past stock returns. Further confirmation of such a strategy can be seen by Piotroski & Roulstone (2005) who found evidence to support the theory that insiders are contrarian investors, as trades by directors were inversely related to recent returns. The significance of such studies reveals that insiders attempt to conceal their trades and in turn tend to trade in the opposing direction to the market. However, the contrarian strategies are unlikely to be the driving factor for the future return performance of insider transactions. According to Piotroski & Roulstone (2005), insider trades are positively associated with the firm's future earnings performance.

There is also a great deal of research to support the theory that directors can earn greater returns in small, less publicized companies. Studies by Seyhun (1986), Hillier & Marshall (2002), Etebari, Gilbert & Tourani-Rad (2004), and Ryan (2005), found that abnormal stock returns were concentrated in small sized and lower profiled companies. They attribute this phenomenon to a less continuous flow of information from smaller companies, and fewer brokers following the performance of these companies. Exceptions are Lin & Howe (1990), and Eckbo & Smith (1998), who find no significant evidence of a relationship between firm size and profitability.

In related studies, researchers have looked for a relationship between the size of a director's trade and the determination of its information content. While we may anticipate a director's trade to be more informative, if it is very large in line with the theory presented by Wisniewski (2004) and Piotroski & Roulstone (2005), it may also be argued that they attempt to mask their action by trading in smaller packages in order to avoid detection. Trading in large parcels would increase the probability of detection and can result in prosecution for insider trading. Kyle (1985), Seyhun (1986) and Easley & O'Hara (1987) all found smaller trades to be more information driven and profitable. Barclay & Warner (1993 report that the optimal size of an information-driven trade tends to be small to small-to-medium. In some of the more recent studies, Hillier & Marshall (2002), and Etebari et al (2004) find smaller trade sizes to be more profitable. However, counter to much of the existing literature, Bettis, et. al (1997) suggest that outside investors can earn abnormal profits, net of transaction costs, by analyzing publicly available information about large insider transactions of top executives.

Of more relevance to Australia, Etebari et al (2004) have examined insider trading by corporate insiders in New Zealand. They found the size of the company, the position of the insider, and the percentage of the insider's holdings being traded all affect the size of the abnormal returns. They also found transactions involving immediate disclosure earned insignificant returns in comparison to those that involved delayed disclosure. This lends support to the argument recently proposed that directors in Australia must disclose changes to their holdings of company stock within 2 business days, in contrast to the current five days required by the ASX Listing Rules, and 14 days required by the Corporations Act 2001[3].

Researchers have attempted to determine whether the type of trade has an impact on the profitability of director trades; that is, whether buy or sell transactions are more profitable. Much of the existing literature such as, King & Roell (1988), Gregory, et. al (1997), Lakonishok and Lee (2001), and Hillier & Marshall (2002) has in general found buy trades to be profitable, while sell trades to be insignificant. A limited number of studies, however, such as one by Pope et.al (1990), have found sales to be profitable while buys to be insignificant. Then again, Gregory et. al (1994) were able to demonstrate that both directors' purchases and directors' sales can produce significant abnormal returns. Yet, when a size effect is controlled for, only directors' purchases show significant abnormal returns. This result have also been supported by Brown & Foo (1998) study of Australian market. Hillier & Marshall (2002) have

[3] Recommendation was made as a part of the Corporations and Markets Advisory Committee, 'Insider Trading Report' (2003) in which recommendation 1 included strengthening the reporting requirements for directors.

attempted to explain this phenomenon by suggesting that directors' sale is driven by non-informational factors, such as liquidity needs, and purchase is driven by information factors. In contrast to evidence from other stock markets, a study on the Oslo stock exchange by Eckbo and Smith (1998) found that insiders earn a zero or negative abnormal performance on insiders' purchases and sales. Similarly, no evidence was found that the size of the firm, nor the size of the trade, impacted on the performance of insider trades.

With regard to Australia, one of the first studies in this area is an investigation of illegal insider trading by Tomasic (1991). He conducted 79 interviews which included brokers, lawyers, financial advisers, market observers, stock exchange personnel and regulatory officials. The response was mixed, and no conclusion could be positively made about the full extent of insider trading. Thus from theses results it was not possible to say how common the practice is in Australia. Brown & Foo (1998) did a more extensive study, testing the profitability of directors' trade in Australia. However, their data was limited to a sample of directors' trade that took place in just one year (1996). Another relevant Australian study, examining director trading activity is by Watson & Young (1999). In this study, they investigate the trading behavior of executive directors and non-executive directors in and around takeover announcements and found buy activity to be significant early in the event window and immediately prior to the announcement. This finding reveals a disregard for any regulation surrounding directors' actions around significant news periods. The problem of regulatory enforcement has been recently highlighted by the Australian Stock Exchange (ASX) which has found that many directors are failing to disclose trades within their own companies at all or within the adequate time frames as stipulated by the ASX's Listing Rules[4]. This presents a challenge for all research of director trading activity, as it is reliant on the integrity of the data disclosed by directors.

## III. Directors Trading Regulation in Australia

This section will examine the obligations of directors of Australian Listed Public companies on the Australian Stock Exchange (ASX). Directors have a number of responsibilities in disclosing their trades in companies in which they are a director. These obligations are covered by both the Corporations Act 2001, and ASX Listing Rules.

The Corporations Act 2001 sets out strict regulation in the conduct of director trades. Specifically, Section 205G details the requirement of directors to disclose trades in their companies. This legislation requires directors to disclose to the market within 14 days any changes to their holdings of company stock. This requirement also applies to directors who are newly appointed to their position as director, and for the listing of a new company.

This requirement under the Corporations Act is further re-enforced by the ASX's own Listing Rules, under which directors are specifically required to adhere to more stringent regulations in comparison to that of the Corporations Act. This is in relation to Listing Rule 3.19A and 3.19B which are designed to complement the existing director notification requirements of Section 205G of the Corporations Act 2001.

Under the ASX Listing Rules, entities are required to disclose director trades within 5 business days. This requirement takes precedence over Section 205G of the Corporations Act 2001 which stipulates 14 days for such disclosures. While there are more stringent requirements for directors under the ASX rules, their obligations do differ slightly. Section 205G places the obligation of disclosure on the director, but as the Listing Rules are a contract between the ASX and listed entities, rules 3.19A and 3.19B place the primary notification obligation on the entity. Therefore it is up to each entity to enter into an agreement with its directors to ensure the necessary disclosures are made to the ASX.

In ASX Guidance Notice 22, March 2002, the ASX prescribe a pro-forma in which entities can enter into such an arrangement with its directors. This was designed to aid entities in complying with its obligations to the ASX, and in addition makes directors aware of their individual obligations to their companies.

The ASX further reinforces director disclosure policy under the 'ASX Corporate Governance Council's Principles of Good Corporate Governance and Best Practice Recommendations'. Principle 3 aims to promote 'Ethical and Responsible Decision-Making', and specifically Recommendation 3.2 requires companies to disclose the trading policy of its directors, officers and employees[5]. This should be widely accessible for investors and regulators alike, and in addition it provides guidance to directors of their individual obligations stipulated by the ASX and ASIC[6].

While there are a number of regulations stipulated by ASIC and the ASX surrounding director trades, it is the practical enforcement of these laws

[4] ASX Media Release 19 October 2005, 'ASIC and ASX Urge Directors to Notify Market Operators of Shareholding'. Joint campaign by ASIC and ASX to increase awareness among directors of listed public companies to disclose their trades. This was undertaken as a result of findings by the ASX, ASIC, and BT Governance Advisory Service, which found directors failed to comply with their obligations to disclose changes in their holdings.

[5] Recommendation 3.2, Principles of Good Corporate Governance and Best Practice Recommendations, March 2003, p. 26.

[6] As a result, directors have no excuse of not knowing the rules.

that has come under recent scrutiny. One of the fundamental investigations into the enforcement of director share trading in Australia was a report released in November 2005 by the BT Governance Advisory Service. The report was commissioned by institutional investors who found that S&P/ASX200 companies and directors may not be doing enough to prevent perceptions of insider trading[7].

The report found that 15% of all trades by S&P/ASX200 directors, 432 out of a total of 2936 trades in 2004, were not notified to the market within 5 business days as required by ASX Listing Rules. Late lodgment of trades ranged from a few days to more than 4 years in some cases. This was widespread across over 60% of companies within the Index, as a total of 123 companies failed to disclose changes in directors' interest within the required time. They also found 3 companies which did not have a share trading policy as recommended by Principles 3 of the Good Corporate Governance Council. These findings reveal a systemic failure of the regulations set by the ASX.

The BT report also noted some of the implications of poor corporate governance in director trading. They cited market risk, litigation risk and regulatory risk as a consequence of poor market supervision. Market risk was tied with investor confidence, as investor perception of directors making abnormal profits due to private information may lead to the appearance of an 'unlevel playing field'. Late lodgment of director trades may also limit investors' ability to profit from observing director activity. A study by Bhattacharya & Daouk (2002) found that the cost of equity in a country does not change after the introduction of insider trading laws, but decreases significantly after the first prosecution. Glosten & Milgrom (1985) also found a market based cost to insider trading resulting in a market becoming less liquid and less informationally efficient. Therefore the importance of enforcement of these laws in the Australian context is crucial to avoid any perception of director misconduct and potential damage to the reputation of the market.

## IV. Hypothesis Testing, Data, and Methodology

In light of insight gained from previous research and current legislation, we have applied a number of tests to detect abnormal returns from directors' trade on the Australian Stock Exchange. These results will have certain implications for the Efficient Market Hypothesis (EMH). A strict view of the EMH implies that those in a position that may be privy to private information should not be able to generate abnormal returns. Thus a possible proxy to test the profitability of private information may be an analysis of the trading activities of directors within their own companies. If the Australian share market was inefficient, we would expect that company directors, who can be assumed to have access to inside information about their company, would be able to time the purchase (sale) of their shares before a future increase (decrease) in the share price. Empirically director trades do appear to be a reasonable proxy for private information since much of the research indicates abnormal returns being generated. We may reasonably assume that directors of Australian Listed Companies have access to information that is not publicly available. It is whether they trade and profit from such information that has a number of implications for market efficiency. If we find directors of ASX companies making abnormal returns, we may then be able to reasonably argue that the Australian market is not strong form efficient. There may also be a number of implications for 'outside' investors who can mimic directors' trade if they observe that they are consistently outperforming the market.

In line with the existing literature, we wish to test for statistically significant positive (negative) cumulative abnormal returns in relation to director purchases (sales). This may be due to a director's foreknowledge of an upcoming good (bad) news event or any other significant accounting disclosures. We expect director trades to be well timed, and in turn outperform (underperform) the market, thus generating an abnormal return.

We shall also test for cross-sectional determinants in the profitability of director trades by examining whether there is any significant relationship between abnormal returns and the nominal size of a director's transaction.

The study covers trades by directors of all Australian Stock Exchange (ASX) listed companies during the period from January 2002 to April 2006. The director trade data was provided by Aspect Huntley Pty Ltd. The trades excluded from our dataset include indirect transactions, in which indirect shares were those not necessarily held under the owner's direct name. Transactions involving options were also eliminated as there is no distinction made in the data if this was an exchange trade option, or an option issued as a part of a director's remuneration package. Since it could not be determined whether the director made a conscious decision to purchase or sell the option, all options were eliminated from the dataset. This decision is consistent with the finding by Gregory, et.al (1997) that, in the majority of cases, including options did not change their results. The final dataset then only included direct purchases and sales made by directors within the sample period, and consisted of 6,913 buys, and 1,140 sells over the four-year period from January 2001, to April 2004. To be included in the sample, a director of a listed company had to trade at least once in the sample period. This resulted in transactions from 1,052 firms listed on the ASX.

[7] Institutional investors were PSS/CSS, the Catholic Superannuation Fund, Vic Super, the NT Government & Public Authorities, Superannuation Scheme & Emergency Services Super.

The daily returns and the number of outstanding shares data for companies listed in our final dataset were provided by the Securities Industry Research Centre of Asia Pacific (SIRCA). Data for the number of outstanding shares was necessary in order to construct the ten equally weighted portfolios. The daily All Ordinaries Index data, representing the return on the market, were also provided by SIRCA. In total the study utilized four separate data sets: trades made by directors, daily company returns, daily All Ordinaries Index returns and the number of outstanding shares of each company.

Table 1 presents a summary of trades by directors. They provide a degree of insight into the differing descriptive statistics of buy and sell trades. Purchases make up 85.84% of total director transactions in the sample period. While we see that there were many more purchases than sales, the mean number of shares sold was nearly four times that of purchases. This was also reflected in mean purchase value of $93,795, as compared to a sale of $757,550. The median value of transactions for purchases and sales also reflected a similar ratio, in which the median buy was $7,500 as compared to the median sale of $86,140[8]. These results indicate directors were selling far less frequently, but when they did sell shares in their company, they were trading a much larger quantity and value.

The high value associated with director sales can also be seen in Table 2. We can see director sales over $1,000,000 account for nearly 13% of total sales, as compared to only 1.38% of total purchases. Figure 1 also reveals the very high frequency of director purchases between $1,000 and $10,000. These account for 47.91% of buy trades, while only 11.07% of sell trades[9]. It is not until we see transaction values equating to between $25,000 and $50,000 that the proportion of sales (11.14%) is higher than purchases (7.97%). Table 2 reveals the high degree of purchase transactions at the lower values, also exposing the high frequency of sell transactions.

Analyzing the percentage change in a director's portfolio, as seen in Table 1, portrays a similar story. The percentage change in a director's portfolio is defined as the number of shares traded divided by the number of shares held by the director prior to the trade. The median change in directors' purchases was 4.80%. This is significantly lower than the sell sample, in which we find a median of 19.12%. Therefore it appears directors are selling a greater proportion of their portfolio in each transaction, as compared to purchases. This may be due to a number of factors. Personal liquidity constraints may limit the expenditure directors can afford in purchasing their company shares. This may force them to smooth their purchases by breaking up their transactions into multiple trades over a longer period of time.

Alternatively we may see greater returns from sales, due to the strength of signal arising from large sell transactions. If directors are trading both relatively and absolutely more of their portfolio, as shown in Table 1, this may be argued as a stronger signal to the market. Thus the price reaction arising from such a trade may be greater, and result in a larger fall in the share price. For this reason, we may infer sell trades to be more profitable.

In order to estimate abnormal share price returns, an event study methodology was adopted for the analysis. The event is defined as the day the director transaction took place. Since we expect different results for buy and sell trades, the sample has been split into two subsamples. The market model was the adopted approach for the analysis. The advantage of such a model is that it controls for the effect of market movements through the market portfolio, and also allows for an individual security's responsiveness, as measured by beta[10]. The estimation period for the market model is consistent with recent studies from Hillier & Marshall (2002), and Etebari, et. al (2004) who adopted an estimation period well before the event (trade) took place. For each event we estimated the market model over day's t = - 200 to t = - 61 called estimation period. Beta was calculated by using the Scholes and Williams (1977) procedure. As in OLS, the intercept estimator forces the estimated regression line through the sample mean. Using the market model as a benchmark, the abnormal returns of each security over a test period run from T = - 60 days prior to the event date, to T = + 120 trading days after the event date[11]. A relatively long event window was chosen to reveal the long-run effects of director trading, although abnormal returns for shorter subperiods around the event date shall also be reported. In addition, following Duncan & Etebari (1997), and Etebari et al (2004), the average abnormal return (or average prediction error) $AAR_T$ was calculated over an interval of two or more trading days beginning with day $T_1$, and ending with day $T_2$. For example, we shall later estimate an event window of $T_1$ = - 60 days before the event through to $T_2$ = + 120 days.

[8] The large difference in mean and medians between buy and sell trades is consistent with the existing literature. It suggests a small number of very large transaction value have skewed the mean value, thus it is also useful to display the median trade values. See Brown & Foo (1998) and Hillier & Marshall (2002).

[9] These figures are consistent with Brown and Foo (1998) study of Australian market.

[10] To save on space, the details of event study methodology are not presented here. Interested readers may refer to papers by MacKinlay (1997), Binder (1998), and Khotari & Warner, (2004) for more details.

[11] We use t as an abbreviation for the estimation period and T as an abbreviation for the test (event) period.

**Table 1**. Descriptive Statistics of Sample

| | |
|---|---|
| No. of Companies | 1,052 |
| No. of Buys | 6,913 |
| No. of Sells | 1,140 |
| No. of Trades | 8,053 |

| | *Buy Sample* | *Sell Sample* |
|---|---|---|
| *No. of Shares Traded* | | |
| Mean | 143,340 | 565,257 |
| Median | 4,361 | 85,081 |
| *Value of Shares Traded* | | |
| Mean ($) | $93,795 | $757,550 |
| Median ($) | $7,500 | $86,140 |
| *% Change in Portfolio* | | |
| Mean | + ∞* | 35.07% |
| Median | 4.80% | 19.12% |

Notes:
*No. of Shares Traded* is defined as the number of shares the director buys or sells; *Value of Shares Traded* is defined as the number of shares traded multiplied by the transaction price; *% Change in Portfolio* is defined as the number of shares traded divided by the number of shares held by the director prior to the trade;
* The mean buy % change in portfolio is + ∞ since the initial holding for some directors in the sample was zero.

**Table 2.** Frequency Distribution of Size of Director Trades

| | All Trades By Value | | All Trades by % of total BySell | |
|---|---|---|---|---|
| Size ($000's) | Buy | Sell | Buy | Sell |
| < 1 | 785 | 18 | 11.36% | 1.59% |
| 1<10 | 3,312 | 127 | 47.91% | 11.07% |
| 10<25 | 1,137 | 168 | 16.45% | 14.78% |
| 25<50 | 551 | 127 | 7.97% | 11.14% |
| 50<100 | 440 | 160 | 6.36% | 14.03% |
| 100<250 | 361 | 181 | 5.22% | 15.92% |
| 250<500 | 142 | 105 | 2.05% | 9.17% |
| 500<1,000 | 90 | 107 | 1.30% | 9.40% |
| > 1,000 | 95 | 147 | 1.38% | 12.89% |
| Total | 6,913 | 1,140 | 100% | 100% |

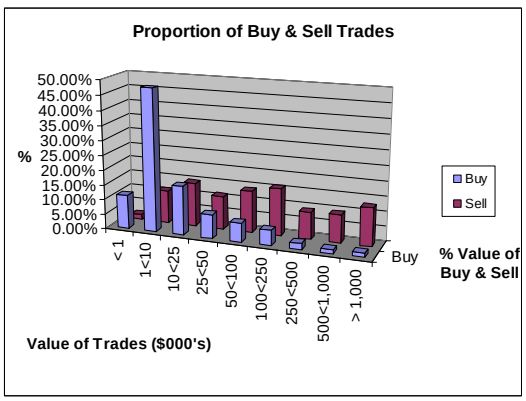


**Figure 1.** Proportion of Buy & Sell Trades

The standardized cross-sectional Z-test is applied to measure the statistical significance of CARs. This test is reported to perform well, even if there is an increase in the variance within the event period. Boehmer et.al (1991) report on this finding, and as such, it is a more appropriate test for our sample, which consists of some small, thinly traded companies. In addition, the actual director's trade itself may result in an increase in the volume of trades, leading to an increase in return volatility. The assumptions behind this test include the returns being both cross-sectionally independent and normally distributed. Due to the central limit theorem, the distribution of the sample average standardized abnormal returns is normal.

In order to test for a negative relation between a firm's size and the profitability of a director's trade, we must first assign portfolios according to size. Each month, all firms were ranked according to their market capitalization and sorted according to five equally weighted portfolios[12]. Average portfolio returns and betas were generated using the daily ASX company return data provided by SIRCA.

The frequency of director trades can be seen in Table 3 below. It reveals that in our lowest portfolios, there was very thin director trading. Most of the trades were attributed to the largest cap company portfolio which accounted for over 60% of the total trades in our sample.

## V. Results

In order to determine the profitability of director trades, we analyzed CARs during the period surrounding director's trades. Table 4 displays CARs generated using event windows commencing 60 trading days before the transaction, and tracks the performance to 120 trading days after the event. The overall sample's mean CAR for buy and sell reveal that positive abnormal returns are generated well before the transactions took place. We can see in the period prior to the event, the CARs for both the buy and sell trade events are statistically significant and positive, however, buy transactions display smaller CARs. With the event horizon commencing at day -60, a mean CAR of 2.36%, significant at the 5 percent level, is associated with buy transactions, and a mean CAR of 5.44%, significant at the 0.1 percent level, is associated with sell transactions.

In a shorter period after the event day, buy CAR remains small and positive, however, sell CAR reverse in size and become negative. For the event window of T = 0 through to T = + 5, buy CAR is 0.19%, significant at the 5 percent level. In contrast to findings by Hillier and Marshall (2002) who found much of the buy CAR could be attributed to the days immediately after the trade, this may indicate the market has not reacted strongly to the buy transaction. However, it is important to note that investors may not be aware of the trade at this point, as directors have up to five days to disclose their trades under ASX Listing Rules[13]. In addition, information in table 4 is only relevant for directors' trade profitability, and as such no comprehensive conclusions can be drawn about the speed of market adjustment.

Results in table 4 reveal a reversal of trends for sell transactions. In the days prior to the sell trade we saw significantly positive large CARs. However only five days after the sell transaction, we see a reversal of the CAR at -0.44%, significant at the 0.1 percent level. This reversal in CAR is followed through for all our event window intervals at 30, 60, 90, and 120 days respectively. We see in the event window of T = 0 day to T = 120 days, a CAR of -9.39%, significant at the 1 percent level. Nearly half of this negative return is accounted for in just the first 30 days after the trade, with a CAR of - 4.19%. Our results indicate that directors who sell their company shares appear to time their trades almost perfectly. Evidence of price reversal in sale transactions is also supported by Lakonishok and Lee (2001). They suggest that directors sell shares in their companies after an increase in the price. The price reverses afterwards and results in negative returns.

Alternatively, for buy transactions, the abnormal returns are significantly lower. After 30 days, there is a positive abnormal return of just 0.18%, significant at the 10 percent level. This initial very small abnormal return may be a result of directors trading on future information that has yet to be disclosed to the market. Thus as such this information has not been priced. This argument is supported when we stretch the event period out to 90 and 120 days respectively, as we see higher abnormal returns of 2.93%, significant at 0.1 percent level and 3.98%, significant at the 0.1 percent level. This result may suggest directors who purchase their company shares are better able to predict the long run performance of their company, and the forthcoming increase in the share price. However, the returns are quite modest in comparison to sell trades, and are further reduced when factoring in transaction costs[14].

[12] Five portfolios were constructed over the traditional ten portfolios as done by many US and UK studies. This was due to problems of thin trading in the Australian market. When ten equally weighted portfolios were constructed in this study, there were a number of lower deciles that had very few director trades, which thus limited our scope to test for a size effect. Therefore five equally weighted portfolios were deemed more appropriate.

[13] ASX Listing Rule 3.19A and 3.19B.

[14] Rozeff and Zaman (1988) applied a 2% transaction cost to trades. Thus if we apply a similar cost to our buy trades, this nearly eliminates any potential abnormal profits.

**Table 3.** Frequency of Trades by Portfolio

| Portfolio | Purchase Transactions | Sell Transactions |
|---|---|---|
| 1 | 143 | 27 |
| 2 | 432 | 69 |
| 3 | 707 | 156 |
| 4 | 1,272 | 351 |
| 5 | 4,359 | 537 |
| Total | 6,913 | 1,140 |

**Table 4.** CARs for Buy and Sell Trades from Prior to and Post Director Trade Dates

| | Buy Transactions | | Sell Transactions | |
|---|---|---|---|---|
| Window (days) | Mean Cumulative Abnormal Return | t-stat | Mean Cumulative Abnormal Return | t-stat |
| - 60, - 1 | 2.36 | (1.730)* | 5.44 | (4.711)*** |
| - 30, - 1 | 0.67 | (4.406)*** | 2.33 | (2.440)** |
| - 1, 0 | 0.14 | (1.830)* | 0.39 | (2.222)* |
| 0, + 1 | 0.05 | (1.106) | 0.26 | (0.697) |
| 0, + 5 | 0.19 | (1.836)* | - 0.44 | (-3.702)*** |
| 0, + 30 | 0.18 | (2.128)* | - 4.19 | (-6.304)*** |
| 0, + 60 | 1.42 | (1.868)* | - 4.41 | (-3.193)*** |
| 0, + 90 | 2.93 | (5.719)*** | - 7.07 | (-3.483)*** |
| 0, + 120 | 3.98 | (6.924)*** | - 9.39 | (-2.966)** |

Notes: Reported returns are in % form. The symbols $, *, **, and *** denote statistical significance at the 10%, 5%, 1%, and 0.1% levels.

Figure 2 illustrates how directors have timed the profitability of their trades. The line graph indicates the CARs from event period T = -60 days through to T = + 120 days. It reveals the extent to which directors appear to time their sell trades. The CAR for sell trades is continually increasing until the director sells at T = 0, in which the CAR decreases sharply. It reveals directors have timed their sale transaction almost perfectly by selling just before their company's downturn in price.

Figure 2 uncovers a different picture for buy trades. We see a much flatter CAR in the days before the buy transaction taking place. This continues to plateau over the next 30 days past the event date, until the CAR eventually starts to rise again. It shows the abnormal returns generated from buy transactions are occurring many days after the transaction. This is in contrast for sell transactions in which we see an immediate response.

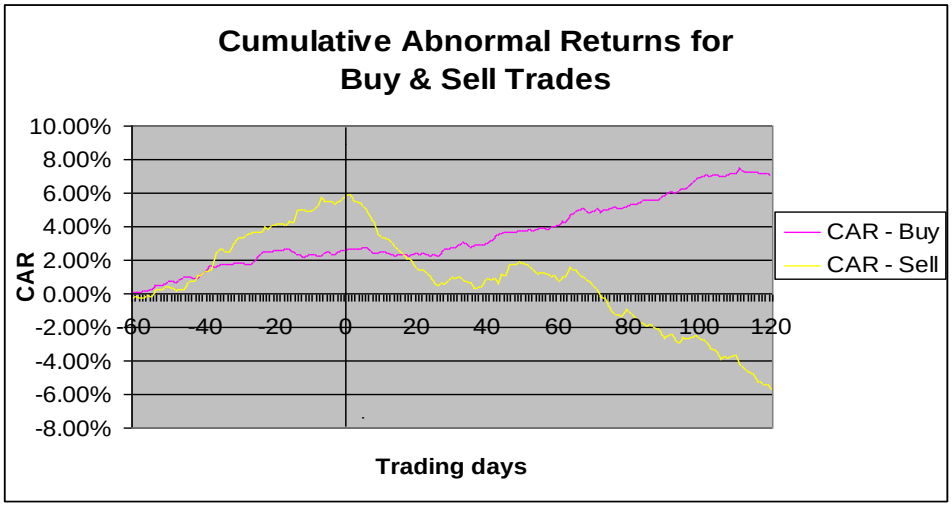


**Figure 2.** Cumulative Abnormal Returns for Buy & Sell Trades

**Table 5.** Profitability of Purchases by Transaction Value

| Purchase Transactions Portfolio | 60 Day Pre Event CAR % | | Event Day AAR % | | 60 Day Post Event CAR % | |
|---|---|---|---|---|---|---|
| < $25K | 2.90 | (2.569)** | 0.07 | (-0.583) | 2.25 | (2.321)* |
| ≥ $25K < $250K | 0.11 | (-1.974)* | - 0.18 | (-2.177)* | - 1.48 | (-0.837) |
| ≥ $250K | 1.63 | (-0.378) | - 0.11 | (0.483) | - 3.70 | (-1.103) |

Notes:
Reported returns are in % form. The symbols $, *, **, and *** denote statistical significance at the 10%, 5%, 1%, and 0.1% levels.

**Table 6.** Profitability of Sells by Transaction Value

| Sell Transactions Portfolio | 60 Day Pre Event CAR % | | Event Day AAR % | | 60 Day Post Event CAR % | |
|---|---|---|---|---|---|---|
| < $25K | 2.65 | (0.721) | 0.16 | (0.446) | - 8.36 | (-2.227)* |
| ≥ $25K < $250K | 5.23 | (2.707)** | 0.16 | (0.230) | - 4.20 | (-3.091)*** |
| ≥ $250K | 8.36 | (4.538)*** | 0.42 | (0.477) | - 1.96 | (-0.371) |

Notes:
Reported returns are in % form. The symbols $, *, **, and *** denote statistical significance at the 10%, 5%, 1%, and 0.1% levels.

A similar pattern was found for sell transactions as detailed in Table 6. There were no significant returns in the post event period of T = + 60 days for purchase transactions over $250,000. Again they were the smaller transactions that revealed significant CARs. For sell trades under $25,000, the mean CAR was - 8.36%, significant at the 5% level, at the T = + 60 day interval. At the equivalent event period for the total sell sample as detailed in Table 5.2, there was a CAR of - 4.41%. Thus, sell transactions under $25,000 appear to result in almost twice the negative CAR as compared with the total sample of sells.

These results indicate that the profitability of both buy and sell trades are inversely related to transaction value.

The results are consistent with the theory present by Barclay and Warner (1993) who also found small trades to be more profitable. They suggested this may be due to the perceived increase in probability of detection from large transaction values. However it is not possible to determine the exact reason as to why smaller trades are more profitable. It may be argued that larger trades have greater informational content, however much of the existing literature supports our findings that trade size is inversely related to abnormal returns[15].

In order to determine whether returns are size specific, we examine the relationship between abnormal returns and the size of the firms. Tables 7 and 8 present the results for buy and sell trades respectively[16].

Table 7 reveals a strong negative relationship between firm size and abnormal returns for purchase transactions. In the post 60 day event period for the lowest ranked portfolio, there is a CAR of 9.66% significant at the 5 percent level. This is 8.24% higher than the return generated on the total sample of buy trades within the same event period[17]. The positive CARs from each portfolio continue to reduce as we move through each of the sized portfolios. Interestingly, we have statistically significant negative

[15] Existing literature that found small trades to be more profitable include, Kyle (1985), Seyhun (1986), Easley & O'hara (1987), Barclay & Warner (1993), Hillier & Marshall (2002), and Etebari, Tourani-Rad, & Gilbert (2004).

[16] The detailed estimated results for buy and sell transactions ranked according to firm size are available. However, they are not presented here due to the limitations on space.

[17] Refer to Table 4.

CARs for our upper two portfolios in the post 60 day event period. This reveals director purchases of our top two ranked portfolios are actually making negative abnormal returns on their trades. The positive CARs appear to be driven by small cap companies for purchase transactions.

The results are similar for sell transactions. While Table 8 reveals in the post 60 day event period only our top three portfolios to be statistically significant, we can still observe a negative relationship between firm size and absolute CAR value. In the third ranked portfolio within this event period, we find a CAR of -18.83%, statistically significant at the 5% level. Although this observation appears to be unusually large in absolute value, it is important to note that there were only a limited number of sell trades in this portfolio[18]. Thus the results in this portfolio may be magnified due to a number of outliers. We continue to find statistically significant negative returns for our largest two portfolios. A CAR of -6.81%, significant at the 0.1% level for portfolio 4, and a CAR of -5.03% significant at the 0.1% level for portfolio 5, were also found in the 60 day post event period. This reveals that CARs become less negative as firm size increases.

The results obtained from sell transactions follow a similar trend to our buy trades. Small cap companies were associated with large positive CARs for buy trades, which is consistent with the large absolute CARs observed for sell trades in the lower ranked portfolios. Therefore we can conclude there is a negative relationship between firm size and cumulative abnormal returns.

## VI. Summary and Conclusion

The aim of this paper was to empirically investigate the relationship between the trading activity of directors in their own companies and the market price performance of these companies surrounding such trades. Our results indicate that directors are making abnormal returns on their transactions. Buy trades are followed by an increase in their company's share price, while sell trades are followed by a fall in price. In the cross sectional examination of director trades, a negative relationship was also found in relation to the size of the trade and the size of the firm in determining the level of director profitability; that is, greater profits are generated by low valued trades and in firms which are small in terms of market capitalization.

One of the most significant challenges when analyzing director trading activity is distinguishing varying rationales of the trading decisions by directors. Trades may be motivated for any number of reasons and as a result may not be purely informational. Non-informational motives may include liquidity and taxation requirements, and the closing out of speculative long positions. In addition, directors who resign from the company may reduce or sell off their entire holdings within a company. The added difficulty remains in defining an 'informed' insider as opposed to an 'uninformed' insider. We can only proxy for what is believed to be an informed trader, in which all company directors were categorized for this study. However it may be possible to differentiate the type of directors into specific categories as some may be better informed than the others. For example Etebari's, et. al (2004) study on the New Zealand exchange separated executive and non-executive directors. They also separated the CEO and chairman, and compared their results. In general they found the position of the director impacted on the size of the abnormal return. Thus an obvious extension for this study would be to separate trade data according to the position of directors and conduct a comparative study. Corporate groups may have different informational content and as a result their trades may be motivated by varying factors. The profits generated on their trades may also differ, which would assist outsiders in identifying an appropriate trading strategy based on such information.

Another extension for this research is to analyze the trading activity of directors around company announcements. Such studies have been conducted overseas, and have found that directors trade in the periods well before significant news and accounting disclosures[19]. No Australian study can be found that has examined director trading activity around corporate news announcements. A further extension to this study could be to analyze the value of aggregate directors' trades by constructing a purchases-to-sales ratio, and tracking it against the performance of the All Ordinaries Index. This research was limited in that the dataset only included a trade date, however it may also be informative to analyze the markets reaction to the disclosure of the trade. Such an analysis could possibly use intra-day data, and test for any significant differences between the trade and disclosure dates. This would provide a clearer insight into the efficiency of the ASX, and the possible speed of price adjustment.

[18] Portfolio three for sell transactions contained 156 observations out of the total 1,140 sell transactions.

[19] See Ke, Huddart & Petroni (2003), and Wisniewski (2004).

**Table 7.** Purchase Transactions by Size Portfolios

| Purchase Transactions Portfolios | 60 Day Pre Event CAR | % | Event Day AAR | % | 60 Day Post Event CAR | % |
|---|---|---|---|---|---|---|
| 1 | 1.81 | (-0.091) | - 0.45 | (0.520) | 9.66 | (2.090)* |
| 2 | - 1.54 | (-0.954) | 1.14 | (2.899)** | 7.52 | (3.560)*** |
| 3 | - 3.21 | (2.175)* | 0.33 | (0.547) | - 0.44 | (0.392) |
| 4 | - 0.49 | (-1.594)$ | - 0.29 | (-2.143)* | - 2.63 | (2.394)** |
| 5 | - 1.23 | (6.211)*** | 0.00 | (-0.825) | - 1.12 | (-5.937)*** |

Notes:
Portfolios were ranked according to market capitalization with portfolio 1 being the lowest, through to portfolio 5 as the highest.
Reported returns are in % form. The symbols $, *, **, and *** denote statistical significance at the 10%, 5%, 1%, and 0.1% levels.

**Table 8.** Sale Transactions by Size Portfolios

| Sale Transactions Portfolio | 60 Day Pre Event CAR | % | Event Day AAR | % | 60 Day Post Event CAR | % |
|---|---|---|---|---|---|---|
| 1 | - 8.29 | (-0.205) | 0.25 | (0.456) | - 1.42 | (0.777) |
| 2 | 0.51 | (0.656) | 0.05 | (0.448) | - 8.35 | (-0.155) |
| 3 | 1.40 | (0.744) | 0.87 | (0.646) | - 18.83 | (-3.006)* |
| 4 | 5.56 | (3.660)*** | 0.07 | (-0.091) | - 6.81 | (-4.815)*** |
| 5 | 0.80 | (0.738) | 0.06 | (0.094) | - 5.03 | (-6.661)*** |

Notes:
Reported returns are in % form. The symbols $, *, **, and *** denote statistical significance at the 10%, 5%, 1%, and 0.1% levels.

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