

## Executive Stock Option Exercises and the Predictive Ability of Transaction Value

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This paper investigates the predictive ability of executives' stock option exercises by categorising all exercises by the overall value of the transaction. This measure incorporates the cost to the executive of exercising the option, together with the income generated by the associated sale of stock at the time of exercise. As a result, we show that, in contrast to the existing literature, executive stock option exercises do have predictive ability for future stock returns. This is, however, limited to transactions that generate net revenue for the executive, a finding that is the reverse of the evidence relating to standard executive transactions.

JEL Classification – G14

Keywords – Executive Stock Options, Insider Trading, Predictive Ability.

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## 1. Introduction

The existing research on the informativeness of insider transactions has reached an apparent consensus on several points. A key finding is that whilst there is information contained in the trades of insiders (principally executives), this information content is restricted to purchases and not to sales. The explanation for this asymmetry is that, in the case of purchases, executives have to make an actual investment in the stock, whereas a sale could be induced by a number of factors including a liquidity requirement or the need to diversify.

A second finding to emerge from the literature is that there appears to be little information contained in the exercise of executive stock options. This is explained by the fact that the decision to exercise may be complicated by the inherent restrictions imposed on the executive by the option. These restrictions include a vesting period during which the option cannot be exercised, the inability to sell the option and an expiration date. In addition, it is generally argued that there is no rational reason for an executive to exercise an option and hold the stock acquired at exercise. If the executive sells the stock acquired, then it follows that it would be unreasonable to expect the transaction to be informative given the absence of an information content in standard sales.

In contrast to this existing research, executives in the UK do not sell at exercise all the stock they acquire. The predominant reason for this is the tax regime in the UK, which during this period allowed executives to delay the tax

liability associated with the gains made at exercise until the stock was sold. This tax related incentive to hold the acquired stock means that an investment in stock via the exercise of an option should be relatively uninformative. In contrast, a decision to exercise and sell should be much more informative.

In view of the distinction between purchases and sales and the predictive content they have for subsequent returns, we similarly distinguish between option-related transactions that require the executive to make an actual investment in the stock, and those that generate an income. Consistent with this, we find that there is little predictive ability over subsequent returns where the transaction is one that is classified as being an investment, i.e. where an executive decides to exercise and hold. Despite the transaction requiring the executive to make a net investment in the stock, the tax incentive to hold the stock acquired means that there is little information contained in these trades. However, we find that a transaction generating revenue for the executive (an exercise and sell) has significant predictive ability for subsequent returns, implying that these trades also have a significant information content. Finally, by distinguishing between the relative size of the transactions, we are able to show that their predictive ability is not uniformly related to their size. One explanation for this is the notion of stealth trading, i.e. insiders who are trading on information attempt to disguise this by trading smaller blocks of shares. Perhaps a more likely explanation for this, however, is that where trades can be classified as being discretionary, they will be significantly more informative than those that may be motivated by liquidity considerations.

As a result, we conclude that not only are stock option exercises by executives able to predict subsequent stock returns, but there is an asymmetry in this predictive ability that is the reverse of that observed for standard insider transactions. This suggests that tax and other factors may be important in determining whether trades are likely to have predictive ability for future stock returns, rather than simply whether the trade generates revenue or requires an investment.

## 2. Literature

The literature relating to insider transactions has been motivated principally by the desire to investigate market efficiency. Ever since Fama (1970) distinguished between different levels of efficiency depending on the type of information that is incorporated into prices, researchers have attempted to isolate those individuals who are likely to have information that is not in the public domain. In addition, there is the interest in determining the profitability of a strategy that mimics the trades of insiders. As a result, a number of academics have examined the stock price reaction to, and hence the predictive ability of, insider trades. Much of this research has focused on the US, and includes studies by Jaffe (1974), Finnerty (1976), Givoly and Palman (1985), Seyhun (1986, 1988, 1992), Rozeff and Zaman (1988), Pettit and Venkaatesh (1995) and Eckbo and Smith (1998). Whilst this early research suggested that both purchases and sales by insiders had predictive ability, more recent research by Jeng, Metrick and Zeckhauser (2000) and Lakonishok and Lee (2001) has concluded that only insider purchases have

predictive ability for future stock returns. Furthermore, this predictive ability is fairly limited, being evident only for insiders within the smaller firms. Research conducted in the UK has reached a similar conclusion. This includes studies by King and Roell (1988), Pope, Morris and Peel (1990), Gregory, Matatko, Tonks and Purkis (1994), and Gregory, Matatko and Tonks (1997). The most recent research by Friederich, Gregory, Matatko and Tonks (2002) (albeit focusing on relatively short time horizons after the transaction), also concludes that purchases are more informative than sales. In addition, Friederich, Gregory, Matatko and Tonks (2002) find that executives purchase / sell stock after significantly negative / positive abnormal returns during the 20 days prior to the trade, indicating that they are adept at timing their trades to take advantage of short-term price movements.

At the same time, academics have examined the predictive ability of insider trades in the form of the exercise of executive stock options. This research has been limited given the assumption that the exercise of executive stock options is unlikely to have predictive ability given the restrictions associated with them. Executive stock options cannot be sold, and in the UK are granted with a three-year vesting period during which they cannot be exercised. Furthermore, an option should not be exercised unless the executive intends to sell the acquired stock, since exercise requires the payment of the exercise price. Consistent with this, there is little evidence to indicate that the exercise of an executive stock option has predictive ability for future stock returns. Carpenter and Remmers (2001) find that in a regime in the US where executives are able to sell immediately the shares acquired at exercise, option exercise has predictive ability only when it is by the most

senior managers in small firms. The associated empirical research confirms these predictions relating to the exercise of stock options. Huddart and Lang (2003) find that option exercise by low ranked employees may have predictive ability for future returns, possibly because they face fewer restrictions regarding when they can trade. In addition, there is consistent evidence that option exercise is related to the performance of the stock prior to exercise. Huddart and Lang (1996) and Heath, Huddart and Lang (1999) find that employees' option exercise decisions are positively related to previous short-term stock returns. In contrast, there is no evidence in the UK that option-related trades have predictive ability for future stock returns (see, for example, Gregory, Matatko, Tonks and Purkis (1994)), or are related to previous stock returns.

The resulting implication, that liquidity or expiration rather than information appear to drive the majority of transactions involving the exercise of executive stock options, is complicated in the UK by the framework within which options are granted. Firstly, the guidelines developed by the Association of British Insurers (one of two associations that represent institutional shareholders) impose a limit on options held of four times the executive's pay. This limit, which Main (1999) states has been followed closely by firms in the UK, gives executives a powerful incentive to exercise irrespective of their expectations about their firm's stock. Secondly, during the period of this study, the tax regime in the UK provides executives with a strong motive to hold the stock acquired at exercise. The reason for this is that the gain made at exercise incurs a tax liability only when the stock is sold. These two factors combine to encourage executives in the UK to exercise and

hold the acquired stock. As a result, a decision to exercise and sell is more likely to be taken if the executive has negative information about the stock.

The evidence that purchases have much greater predictive ability than sales for future stock returns is explained by the fact that they are less likely to be driven by liquidity. This paper extends this distinction between insiders' transactions (on the basis of whether they generate revenue or require an investment) to option-related trades. Specifically, we hypothesise that if such trades have predictive ability, then this should be reflected in the net transaction value at exercise. In addition, we would also expect the net transaction value to be related to previous short-term stock returns.

### 3. Data and methodology

This study is based on data supplied by Directus Ltd for the period January 1992 – July 1998. Directus Ltd compile a complete record of all executive transactions that take place in the UK. This period yields a sample of 5779 exercises for which we have associated stock returns data, together with the exercise price at the time of exercise. Table 1 below presents additional summary statistics relating to our sample of exercises. In addition, we also present data on the two sub samples that we investigate, which we denote as Revenue and Invest. These are respectively transactions that generate net revenue, or require a net investment. The net transaction value is determined simply by the cost of exercise (as determined by the quantity exercised and the exercise price), and the value of the corresponding sale of stock. Only sales of stock that occur at the same time as the exercise are regarded as part of that particular transaction. Although it is possible that an

executive may subsequently sell additional stock, this possibility is disregarded as an analysis of our data indicates it to be rare.

#### Table 1

Table 1 shows that the 5779 exercises within our sample relate to a total of 899 firms. Thus each firm has an average of just over 6 exercises. The average market capitalisation at exercise is £2.65bn. There is some evidence to suggest that the market capitalisation of firms where the executive makes a net investment is smaller than where the executive generates revenue from the transaction. Finally, the number of event days is the number of days during the period on which at least one exercise takes place. Given the respective number of exercises, it is clear that, for the sample as a whole, an average day will see approximately four stock option exercises.

There are two features of our data that preclude the use of a standard event study methodology to test whether an event is associated with an abnormal stock return. These are the lack of independence in pre-event stock returns, and the event clustering illustrated by Table 1. The lack of independence in returns prior to the event arises because the nature of a stock option exercise means that each event must be related to previous stock returns. An option will only be exercised if it is in-the-money, i.e. if the current stock price exceeds the exercise price. As a result, it is unlikely that an exercise will be independent of a stock's previous returns. Furthermore, a specific hypothesis that we wish to examine is whether the decision to exercise is driven by the stock's immediate returns prior to that exercise. There is some evidence consistent with this for employee stock options (see, Huddart and Lang (1996) and Heath, Huddart and Lang (1999)). This lack of



independence means that the use of a market model to calculate abnormal returns around an exercise would not be appropriate.

We overcome the bias that would be induced by the use of a market model by measuring abnormal returns through the use of a benchmark portfolio. The abnormal returns associated with each exercise are determined by the firm's returns relative to the equally weighted returns to their size and momentum benchmark portfolio. At every event, or exercise, we sort all firms into forty benchmark portfolios. These benchmark portfolios are created by an initial sort into deciles based on market capitalisation, followed by a second sort by the previous year's return (up to a month before exercise). Thus there are four momentum ranked portfolios for each size ranked decile, yielding forty portfolios in all. This approach is similar to that applied in Carpenter and Remmers (2001).<sup>1</sup>

The second issue noted above is the clustering of events that is evident in Table 1. This event clustering is likely to induce significant cross-sectional dependence between the abnormal returns. A key assumption in

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<sup>1</sup> We adjust for size because of the strong evidence that size can be important in explaining the cross-section of average stock returns (see, for example, Fama and French (1992)), and is a common approach in the literature (see, for example, Loughran and Ritter (1995) and Esplenaub, Gregory and Tonks (2000)). We also adjust for momentum because of the consistent finding that stocks exhibit return persistence over the medium term (see, for example, Jegadeesh and Titman (1993), Rouwenhorst (1998) and Jegadeesh and Titman (2001)). Adjusting for a momentum effect may be particularly important in our study because we expect the exercise decision to be influenced by previous stock returns. Moreover, Lyon, Barber and Tsai (1999) show that ignoring pre-event returns induces a bias in test statistics of abnormal returns that is positively related to the sign of the pre-event returns. They suggest that matching firms to benchmark portfolios sorted by pre-event return can control for this.

standard event study methodology is that these should be independent, and as a result, we are unable to aggregate the abnormal returns in event time. Such an approach would yield misspecified test statistics. We therefore use a calendar-time approach (see, for example, its application in Brav and Gompers (1997)), which Lyon, Barber and Tsai (1999) show is particularly suited to an analysis where cross-sectional dependence is induced by overlapping returns.<sup>2</sup>

The calendar-time approach is based on determining an abnormal return for each calendar day. The abnormal return ( $AR_{it}$ ) associated with a particular day for any exercise is:

$$AR_{it} = R_{it} - E(R_{it}), \quad (1)$$

where  $R_{it}$  is the return for firm  $i$  on day  $t$  and  $E(R_{it})$  is the firm's expected return, given by the equally weighted return to its benchmark portfolio. From the abnormal returns to each exercise, we derive a time series of abnormal returns for a particular event window. For any event window, the abnormal return each day in calendar time ( $AR_t$ ) is the mean abnormal return to the portfolio of firms  $n_t$  with an exercise in the preceding event period:

$$AR_t = \frac{1}{n_t} \sum_{i=1}^{n_t} AR_{it}. \quad (2)$$

Thus, for example, the abnormal return for the 1 month post-event window on day  $j$  is composed of the mean abnormal return to the portfolio of firms that had an exercise during the month prior to day  $j$ . The components of

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<sup>2</sup> Unfortunately, the calendar-time approach does not produce abnormal returns that would correspond precisely to those that would be experienced by investors following a strategy that

the portfolio of qualifying firms changes each day. The mean abnormal return (MAR) associated with a particular event window is simply the mean of the calendar time abnormal returns:

$$\text{MAR} = \frac{1}{T} \sum_{t=1}^T \text{AR}_t , \quad (3)$$

where T is the total number of days within our sample. To test the null hypothesis that the mean abnormal return (MAR) for any given event window is zero, we use a t-statistic derived from the time series standard deviation of the abnormal returns  $\sigma(\text{AR})$ :

$$t(\text{MAR}) = \frac{\text{MAR}}{\sigma(\text{AR}_t) / \sqrt{T}} . \quad (4)$$

#### 4. Results

As discussed above, we hypothesise that if the exercise of executive stock options has predictive ability for future stock returns, this predictive ability would be determined by the net value of the transaction. The existing research on standard transactions implies that this predictive ability will be greatest where an executive makes an investment, rather than where revenue is generated. However, we note that the framework within which options are granted suggests that executives have a strong incentive to exercise and hold (implying that they should make a net investment in the stock when they exercise). The obvious benefit associated with delaying the tax liability associated with the gain made at exercise means that a decision to generate

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mimicked the trades of the insiders. We find that the event-time abnormal returns are similar to those reported below, but the problem of misspecified test statistics remains.

revenue from an exercise by exercising and selling should have important implications for future stock returns. Specifically, we anticipate that revenue-generating transactions imply negative future stock returns.

In order to investigate this, we calculate the net transaction value associated with each exercise. This is simply the difference between the cost of exercising (exercise price times quantity of stock exercised) and the revenue generated by selling stock at the same time (stock price times quantity of stock sold). If the former exceeds the latter then the exercise is classified as requiring the executive to make an investment, whereas the reverse is a revenue-generating exercise. As shown in Table 1, of our sample of 5779 exercises, 2731 are revenue generating, whilst 3048 require an investment. As would be expected, the average revenue generated (£185,004) is considerably greater than the average investment made (£53,432).

Previous research in the UK relating to standard executive transactions (Friederich, Gregory, Matatko and Tonks (2002)) has suggested that medium-sized trades may be relatively more informative. We therefore similarly distinguish between net trades classified as small, medium and large, where a trade classified as medium is one generating revenue (or requiring investment) of £5,000 - £70,000. Table 2 presents the abnormal returns around exercises classified as requiring an investment, whilst Table 3 presents the same for revenue-generating transactions. Both tables give the abnormal returns for that complete sample of transactions, together with the three subdivisions depending on the size of the transaction.

Table 2

### Table 3

Table 2 shows that there is no evidence of significant post-event abnormal returns where the exercise and sell decision requires the executive to make a net investment. There is, however, some evidence that the decision to exercise is influenced by the previous returns experienced by the stock. These are small but significantly positive for the complete sample, as well as for the medium and large transactions. These results indicate that whilst these transactions have no predictive ability for future stock returns, the decision to exercise and invest in the stock may be related to previous stock returns, suggesting that executives time their exercises to capture short-term gains. This is a feature of exercise decisions that has been observed in respect of employee stock options in the US (see, for example, Heath, Huddart and Lang (1999)).

In contrast to the investment-requiring transactions, the revenue-generating transactions do appear to have strong predictive ability for future stock returns. In addition, the decision to exercise and generate revenue is strongly influenced by the previous stock returns over the month prior to exercise. For the complete sample, pre-exercise abnormal returns are 2.53% (t-statistic of 11.17). This pre-exercise abnormal return for revenue-generating transactions does not depend on the size of the transaction – we obtain returns of 2.59% and 2.54% for the Small and Large sub samples respectively. Post-exercise, revenue-generating transactions imply that future stock return performance will be poor. For the complete sample, we obtain 1 month and 3 month abnormal returns of -0.63% (t-statistic of -2.41) and -1.51% (t-statistic of -3.36). This result is consistent with the fact that

generating revenue at exercise will effectively bring forward a tax liability, and therefore such a transaction predicts subsequent negative abnormal returns.

Table 3 also shows that this predictive ability is inversely related to the amount of revenue generated by the transaction. The Small sub sample yields significant abnormal returns over 1 and 3 months of  $-1.06\%$  and  $-2.57\%$ , whilst the Large sub sample yields insignificant abnormal returns over the same periods of just  $-0.29\%$  and  $-1.09\%$ . One view could be that these results reinforce the 'stealth trading' hypothesis supported by Friederich, Gregory, Matatko and Tonks (2002). They argue that medium value transactions are relatively more informative than large value ones because insiders attempt to disguise the fact that they are trading on information. An alternative view is that a transaction that generates a relatively small amount of income may indicate strong negative information because such a transaction is essentially discretionary. It is difficult to explain a decision to bring forward a tax liability by selling at exercise and generating a small amount of revenue as being driven by liquidity needs. As a result, such transactions are more likely to be informative than large value ones where the decision may be motivated by liquidity. It is unlikely that the impact of taxation can fully explain our results. Transactions that generate substantial net revenue (over £70,000) incur a correspondingly large tax liability. The willingness on the part of the executive to incur this, together with the absence of a predictive content, suggests that liquidity, or diversification, may be important factors motivating their exercise behaviour.

This analysis of transaction value ignores the fact that the predictive ability of a transaction may be determined not just by its size, but by its size

relative to the size of the firm to which it relates. We examine this by measuring the revenue generated (or investment required) at exercise relative to the market capitalisation of the firm. The complete sample results are the same as before. The subdivisions into Small, Medium and Large are now arbitrarily defined to give three equally sized sub samples for both the revenue-generating and investment-requiring transactions.

Table 4

Table 5

The results are presented in Tables 4 and 5. Table 4 shows that there is now some evidence that where the executive makes a large investment relative to the size of the firm, subsequent abnormal returns are positive and significant over the 1 and 3 month periods – 1.17% (t-statistic of 3.44) and 1.06% (t-statistic of 2.00) respectively. This is more in line with existing research relating to standard executive transactions.

The results in Table 5 are again similar to those in Table 3. There is some evidence that the relative amount of revenue executives generate at exercise is positively related to pre-exercise returns. 1 month pre-exercise abnormal returns are 1.78% for the Small sub sample and 3.79% for the Large sub sample. This indicates that the extent to which executives capture short-term gains is determined by the size of these gains. Despite this, the Small sample continues to yield consistently negative and significant post-exercise abnormal returns. It is therefore clear that the predictive ability of revenue-generating transactions is being driven by the smaller transactions, whether this is measured in absolute terms (less than £5,000) or in relative terms to the size of the firm.

## 5. Conclusion

These results contrast with those in the literature for standard executive transactions. The literature documents that purchases are more informative than sales because, it is argued, purchases require the executive to make an investment in the stock. We find no evidence to suggest that this is the case for executive stock option transactions. It is possible that the reason for the lack of predictive ability in transactions that require an investment is the tax regime that applies to the options exercised during this period. Executives only incur a tax liability on the gain they make at exercise when they sell the acquired stock, giving them a strong incentive to exercise and hold in order to delay this tax liability.

The absence of predictive ability for investment-requiring transactions is in contrast to our findings in relation to the revenue-generating transactions. Here we find that executives exercise to capture short-term positive abnormal returns during the month prior to exercise. Post-exercise, these transactions have strong predictive ability for periods up to 6 months. An analysis of this according to the size of the transaction indicates that it is the smaller transactions that drive this predictive ability. We conclude that the larger transactions do not have predictive content because they are more likely to be driven by liquidity, or the need to diversify. These results are consistent with the existing research that finds that medium value transactions are relatively more informative than large value ones, possibly because informed traders attempt to conceal their information by trading smaller blocks of shares.



Alternatively, we suggest that small revenue-generating transactions are essentially discretionary, and therefore may provide more information to outside investors.

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Table 1 Summary Statistics - UK Executive Stock Option Exercises

1992 - 1998

	No. of Exercises	No. of Firms	No. of Event Days	Mkt. Cap. (£m)	Mean Revenue or Investment
All	5779	899	1497	2654	
Revenue	2731	618	1109	2987	185,004
Invest	3048	727	1208	2355	53,432

All represents the complete sample of exercises that take place between January 1992 and July 1998 for which we have the associated data on returns and exercise price. Revenue are those transactions that generate net revenue for the executive, whilst Invest are those transactions that require the executive to make a net investment in the stock. No. of firms is the number of firms for which there is at least one option exercise in the respective categories. No. of Event Days is the number of days on which at least one exercise occurs. Mkt. Cap. is the mean market capitalisation of the firm at the time of exercise. Mean Revenue or Investment is the average revenue or investment for the two types of transaction.

Table 2 Abnormal Returns Associated with Investment Requiring  
Option Exercises

Stock Option Exercises January 1992 – July 1998					
	-1 month	+1 month	+2 months	+3 months	+6 months
Invest All	0.76 [3.04]	0.29 [1.20]	0.32 [1.14]	0.14 [0.39]	-0.00 [-0.01]
Invest Small	-0.06 [-1.68]	0.21 [0.56]	0.62 [1.28]	0.28 [0.44]	-0.95 [-1.05]
Invest Medium	1.09 [3.23]	-0.13 [-0.42]	0.16 [0.48]	-0.07 [-0.16]	0.60 [0.87]
Invest Large	1.32 [2.88]	0.23 [0.46]	-0.51 [-0.94]	-0.32 [-0.49]	-0.24 [-0.23]

Invest represents the mean percentage abnormal returns associated with exercises that require a net investment. Small represents net transactions with a value below £5000, Medium represents net transactions with a value between £5,000 - £70,000 and Large represents net transactions with a value over £70,000. Thus Invest (Small) represents the abnormal return for exercises where the combined cost of exercising and associated sale of stock require the executive to make an effective net investment of less than £5,000. Mean percentage abnormal returns are measured over the respective windows using a calendar time methodology. Calendar day abnormal returns are the mean abnormal returns to all those firms that have an event such that they lie within the particular window on that day. A firm's abnormal return each day is that firm's return minus the firm's respective size/momentum portfolio return. The corresponding t-statistics, measuring significance from zero, are in brackets.

Table 3 Abnormal Returns Associated with Revenue Generating  
Option Exercises

Stock Option Exercises January 1992 – July 1998					
	-1 month	+1 month	+2 months	+3 months	+6 months
Revenue All	2.53 [11.17]	-0.63 [-2.41]	-1.03 [-2.96]	-1.51 [-3.36]	-1.96 [-2.54]
Revenue Small	2.59 [3.51]	-1.06 [-2.06]	-1.30 [-1.83]	-2.57 [-2.92]	-4.39 [-3.01]
Revenue Medium	2.74 [8.82]	-1.42 [-4.74]	-1.90 [-4.80]	-2.40 [-4.91]	-3.13 [-4.05]
Revenue Large	2.54 [9.24]	-0.29 [-0.89]	-0.55 [-1.34]	-1.09 [-1.88]	-0.96 [-1.16]

Revenue represents the mean percentage abnormal returns associated with exercises that yield a net income. Small represents net transactions with a value below £5000, Medium represents net transactions with a value between £5,000 - £70,000 and Large represents net transactions with a value over £70,000. Thus Revenue (Small) represents the abnormal return for exercises where the combined cost of exercising and associated sale of stock yields the executive an effective net revenue of less than £5,000. Mean percentage abnormal returns are measured over the respective windows using a calendar time methodology. Calendar day abnormal returns are the mean abnormal returns to all those firms that have an event such that they lie within the particular window on that day. A firm's abnormal return each day is that firm's return minus the firm's respective size/momentum portfolio return. The corresponding t-statistics, measuring significance from zero, are in brackets.

Table 4 Abnormal Returns Associated with Investment Requiring  
Option Exercises Relative to the Firm's Market Capitalisation

Stock Option Exercises January 1992 – July 1998					
	-1 month	+1 month	+2 months	+3 months	+6 months
Invest All	0.76 [3.04]	0.29 [1.20]	0.32 [1.14]	0.14 [0.39]	-0.00 [-0.01]
Invest Small	0.02 [0.05]	-0.08 [-0.29]	-0.10 [-0.38]	-0.32 [-0.60]	-0.71 [-0.52]
Invest Medium	0.61 [2.00]	-0.43 [-1.50]	-0.60 [-1.22]	-0.89 [-1.77]	-1.59 [-1.36]
Invest Large	1.36 [2.59]	1.17 [3.44]	1.09 [1.87]	1.06 [2.00]	2.15 [1.12]

Invest represents the mean percentage abnormal returns associated with exercises that require a net investment. A sort of net investment relative to the firm's market capitalisation yields the Small, Medium and Large subdivisions respectively. Mean percentage abnormal returns are measured over the respective windows using a calendar time methodology. Calendar day abnormal returns are the mean abnormal returns to all those firms that have an event such that they lie within the particular window on that day. A firm's abnormal return each day is that firm's return minus the firm's respective size/momentum portfolio return. The corresponding t-statistics, measuring significance from zero, are in brackets.



Table 5 Abnormal Returns Associated with Revenue Generating  
Option Exercises Relative to the Firm's Market Capitalisation

Stock Option Exercises January 1992 – July 1998					
	-1 month	+1 month	+2 months	+3 months	+6 months
Revenue All	2.53 [11.17]	-0.63 [-2.41]	-1.03 [-2.96]	-1.51 [-3.36]	-1.96 [-2.54]
Revenue Small	1.78 [5.95]	-0.65 [-2.02]	-2.00 [-3.97]	-2.98 [-5.11]	-2.88 [-2.06]
Revenue Medium	2.13 [7.42]	-0.13 [-0.31]	-0.72 [-1.53]	-1.29 [-2.34]	-1.48 [-1.07]
Revenue Large	3.79 [10.01]	-0.41 [-1.49]	-0.59 [-0.97]	-0.71 [-1.01]	-1.56 [-1.03]

Revenue represents the mean percentage abnormal returns associated with exercises that require a net investment. A sort of net investment relative to the firm's market capitalisation yields the Small, Medium and Large subdivisions respectively. Mean percentage abnormal returns are measured over the respective windows using a calendar time methodology. Calendar day abnormal returns are the mean abnormal returns to all those firms that have an event such that they lie within the particular window on that day. A firm's abnormal return each day is that firm's return minus the firm's respective size/momentum portfolio return. The corresponding t-statistics, measuring significance from zero, are in brackets.