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**R&D Project Announcements  
and the Impact of Ownership Structure**

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Keywords: Capital Investment, Investment Announcements, Research and Development, Event Study

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# **R&D Project Announcements and the Impact of Ownership Structure**

## **Abstract**

This paper examines the stock market reaction to research and development (R&D) announcements made by listed UK companies. We find R&D projects on average to be associated with significant positive abnormal returns. However, the level of these abnormal returns varies significantly with the ownership structure of the firm. In particular, we find the level of abnormal returns to be significantly lower for companies with large institutional investors. This negative relationship may be associated with short-term pressures on the performance of institutional investors.

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# **R&D Project Announcements and the Impact of Ownership Structure**

## **1. Introduction**

It has long been suggested that financial markets are inherently short-termist and as such many valuable investment opportunities are rejected. In this paper, we examine the influence of institutional and insider ownership on the stock market reaction to corporate investment announcements. We use the specific case of company research and development (R&D) announcements since this type of investment would not be expected to produce cash flows in the short-term. The sample is made up of 54 announcements from the Stock Exchange Regulatory News Service registered between September 1991 and September 1996.

The R&D announcements are collected in accordance with the following definition: R&D projects involve the commitment of resources to “work directed towards the innovation, introduction and improvement of products and processes” (Oxford Dictionary of Current English). Such projects have very little certainty about where and when the returns will come and consequently a large proportion of the value of an R&D project is expected to be realised in the long-term.

We find R&D projects on average to be associated with significant positive abnormal returns of 1.0%. However, we also uncover a significant negative relationship between the level of abnormal returns and institutional ownership, suggesting such investors view R&D projects negatively.

The remainder of this paper is organised as follows. We first consider the issue of short-termism and previous empirical literature on R&D announcements in section 2. In section 3 we examine abnormal returns for the set of R&D announcements. This is followed in section 4 by a cross-sectional analysis of the market reaction to R&D announcements with a set of ownership-related variables and market capitalisation is conducted. Our conclusions are contained in the final section.

## **2. Literature review**

Critics of the principal-agent model of corporate governance argue that long-term investments are undervalued by stock markets, which leads to a failure to invest in profitable long-term projects (Charkham, 1994). Keasey *et al.* (1997) comment that the Myopic Market Model “contends that a goal such as shareholder welfare is not synonymous with share price maximisation because the market systematically undervalues certain long-term expenditures – particularly capital investment and R&D spending” (Keasey *et al.*, 1997, p5). The main result of this is that managers are forced by the market into an excessive preoccupation with the short-term share price and short-term earnings in order to avoid the risk of hostile take-overs.

Ball (1991) and Keasey *et al.* (1997) note that managerial concentration on short-term performance in the UK may be primarily a result of the excessive use of performance-related pay and share option schemes. One problem of these schemes being that ill-informed behaviour by markets could reward poor management or penalise good management (Demirag *et al.*, 1994).

A further issue is that of institutional dominance of the UK market (Short and Keasey, 1997). Firstly, significant institutional shareholdings in companies may impose demands on management due to the short-term and earnings-related nature of institutional target setting. Secondly, financial markets and the market for corporate control, through the threat of the sale of shares and/or a takeover, impose a pressure on managers to maintain the stock price and dividends in the short-term (Charkham, 1994).

Studies of the relationship between ownership structure and corporate value have concentrated on firm value in general rather than on market reactions to new information. Berle and Means (1932) suggest an inverse relationship between diffuse shareholdings and corporate performance, although this view is contradicted by Demsetz (1983) and Demsetz and Villalonga (2001), who argue that there should be no systematic relationship between ownership structure and firm performance.

The influence of insider ownership on corporate value has been examined by a limited number of previous studies. A number of US studies have identified positive relationships between the proportion of companies owned by large shareholders and the market value of the firm (e.g., McConnell and Servaes, 1990, Brickley *et al.*, 1988). However, the evidence with regard to inside ownership is mixed. Whilst Demsetz and Lehn (1985) fail to identify a linear relationship between managerial ownership and firm performance, the later studies by Morck *et al.* (1988) and McConnell and Servaes (1990) identify a non-linear relationship,

with a negative impact of high levels of managerial ownership on corporate value. This is attributed to an entrenchment effect.

There are a number of papers which identify the market response to R&D expenditures (Woolridge and Snow, 1990, Chan et al., 1990, Sougiannis, 1994, Green et al., 1996, and Chan et al., 1999). These studies report little in the way of an ‘allergic’ reaction by share prices to R&D spending. The general conclusion of these papers is that a positive response to R&D expenditures is to be expected, with small but significant abnormal returns, although this may vary depending on firm size, industry sector or the level of technology.

### **3. *Data characteristics and average abnormal returns***

The set of R&D announcements was obtained from the Financial Times Extel Database which includes all official announcements made by UK listed companies through the Stock Exchange Regulatory News Service for announcements that took place between September 1991 and September 1996. The category of R&D announcements included 54 announcements of R&D projects<sup>1</sup>. Announcements were only included if R&D was the primary stated purpose of the project<sup>2</sup>. Stock and market-index (the FT All-Share index<sup>3</sup>) returns data were obtained from Datastream. We report abnormal returns calculated using the market-adjusted returns method, although our results are robust to various model specifications<sup>4</sup>.

Insert table 1 here

Table 1 indicates abnormal returns of 1.0% upon the announcement of R&D projects, which is significant at the 99% level. (While somewhat lower, the

median abnormal returns of 0.4% are still highly significant). The average abnormal return we obtain for the UK is comparable with the 1.13% observed by Woolridge and Snow (1990) and 0.85% found by Chan *et al.* (1990) for R&D project announcements in the US.

#### **4. Corporate ownership and R&D project abnormal returns**

In order to examine the influence of institutional and insider ownership on market responses to R&D announcements, data was collected from Crawford's Directory of City Connections and the Stock Exchange Yearbook regarding the proportion of company stock held by board members and their families (BFA) and the proportion of common stock held by substantial institutional shareholders. Institutional owners who owned more than 5% of the common stock of the company were identified from Crawford's Directory. Clearly it is difficult to collect data regarding institutional ownership since levels of ownership are constantly changing. Furthermore, small holdings are difficult to identify. Crawford's Directory of City Connections contains data for the previous year on any substantial shareholders owning over 5% of the common stock of the company. Owners were considered to be institutional owners if they were an insurance or pension fund, an investment company and an investment, merchant or retail bank.

We regress the abnormal returns on the BFA variable and two dummy variables representing levels of institutional ownership. The BFA variable is a continuous variable representing the percentage of the company's shares owned by the board of directors, families of board members or associates of members of the board. Our

data contained 33 cases where a figure for BFA was given in Crawford's Directory. The BFA data was quite widely dispersed for the sample, with a mean of 20.5% of the company and a standard deviation of 12.9%. We also use two dummy variables to represent the level of institutional shareholdings. The first dummy, which we describe as institutional ownership (IO), takes a value of 1 wherever a company has at least one institutional shareholder owning more than 5% of the market capitalisation (33 out of 51 cases entered into the regression). The second dummy representing higher levels of institutional ownership (HI) takes a value of 1 wherever the company has at least 15% of their stock owned by three or less institutional shareholders (21/51).

The regression models are shown in table 2. The coefficients for the ownership variables are consistently negative throughout the regression analysis. The regression coefficients in model 2 indicate that having a single large institutional shareholder alone is enough to impact on the level of abnormal returns. The institutional ownership variable which represents firms with at least one institutional shareholder of over 5% (IO) is significant in the simple regression at the 5% significance level. When included with the HI variable, the IO variable loses its significance.

Insert table 2 here

The negative correlation between institutional ownership and the level of abnormal returns remains strong for companies in which the proportion of ownership by institutions is greater than 15%. The coefficient for the HI variable is significant at

the 5% level in model 3. The explanatory power of the models presented is low, but perhaps most significantly the simple regression model containing only the HI variable has an adjusted  $R^2$  of 9.1%. In all the models in which the HI dummy is included the regression coefficient is negative, implying that the abnormal return is reduced when a company has at least 15% of its stock held by institutions.

The relationship between BFA and abnormal returns is negative and marginally significant in a simple regression, although the coefficient is small. A negative effect might be expected if the proposition of Morck et al. (1988) and McConnell and Servaes (1990) is accepted which states that as the level of insider ownership increases, the level of managerial entrenchment leads to agency costs. However, in the models presented the BFA variable is only significant at the 10% level. In addition, the BFA coefficient is approximately zero and loses its significance when HI is also included in the regression. It is therefore not clear that any relationship exists between the proportion of company stock owned by the Board, Family and Associates and market-adjusted returns.

## **5. Conclusions**

This paper has examined the stock market valuation of R&D announcements with reference to the effect of institutional and insider ownership. We find that information regarding R&D projects contains modest new information about the company's future earnings which is impounded into the share price on day  $t$ . The market-adjusted returns model exhibits an average abnormal return of 1.0%.

Various reasons have been put forward in the literature as to why markets may undervalue R&D projects. We argue that some market participants may not be satisfied with the long-term nature of R&D investment and would prefer to see a faster return on their investment. This may particularly apply to institutional investors, whose performance is subject to short-term pressures. This, combined with the high levels of share holdings by such investors, suggest the possibility of the UK stock market, at least to some extent, being short-termist.

The market-adjusted returns were regressed against variables representing inside and institutional ownership. The level of insider ownership was not demonstrated to influence the level of abnormal return. However, variables controlling for high levels of institutional ownership were found to be significantly and negatively related to abnormal returns, supporting the view that the UK stock market has some short-termist characteristics and that the market response to R&D announcements is dependent on the proportion of the companies stock held by institutional investors.

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**Table 1**  
**Market-adjusted returns for R&D project announcements**

	N	Mean	Std. Dev	Median	Minimum	Maximum
R&D	51	0.010***	0.027	0.004***	-0.034	0.120

The table contains market-adjusted abnormal returns on day t for R&D project announcements in the UK. The model is specified as  $AR = R_i - R_m$ , where  $R_i$  refers to the return on the share and  $R_m$  to the return on the FTSE All Share stock market index. \*\*\* indicates a significant t-test (mean) and Wilcoxon test (median) at the 99% level.

**Table 2**  
**Regressions of abnormal returns**

Model	C	BFA	IO	HI	N	Adj R <sup>2</sup>	F
1	0.017 (0.052)	-0.001 (0.082)			33	0.065	3.241 (0.082)
2	0.020 (0.002)		-0.016 (0.047)		51	0.059	4.156 (0.047)
3	0.017 (0.001)			-0.018 (0.018)	51	0.091	6.022 (0.180)
4	0.017 (0.051)	0.000 (0.322)		-0.005 (0.682)	33	0.040	1.663 (0.207)
5	0.020 (0.002)		-0.007 (0.484)	-0.014 (0.145)	51	0.082	3.229 (0.048)

This table represents the results obtained from regressing event day market-adjusted returns on a dummy variable representing companies which have at least one institutional owner with a holding of over 5% (IO), a dummy variable representing a share of at least 15% held by 3 or less institutional shareholders (HI), and the shareholding held by board members, their families and associates (BFA). N refers to sample size. Data on BFA was not available for all companies, resulting in a reduced sample for regressions including this variable. The significance of the White heteroscedasticity consistent t-test of each variable is given underneath in parentheses. F indicates the F-statistic. The significance of F is given under the F-statistic in parentheses. No autocorrelation was detected for any of the models presented.

## Notes

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<sup>1</sup> Three large positive outliers are excluded from the empirical results.

<sup>2</sup> The sample of research and development announcements included a variety of different types of commitment of corporate resources including research collaborations, development of new production technology, development of new products and services, exploration and development, including development of natural resource discoveries, purchase of exploration property and new pharmaceutical developments. Most of the announcements were made by either pharmaceutical or oil and gas producers. In each case approval or permission may be required before a project can be undertaken. Where shareholders approval is required, the announcement date is the date of first announcement prior to approval.

<sup>3</sup> The use of alternative market indices was examined but had a minimal impact since abnormal returns were calculated on a daily basis (Strong, 1992, Brown and Warner, 1985).

<sup>4</sup> The results of the market-adjusted returns method were compared with the results of several other models including the market model using a beta calculated by making trade-to-trade adjustments. This method was not reported due to the large amount of data which is lost due to the limited observations available to estimate alphas and betas. There was no significant difference between the results of the various models except in cases where alphas and betas were estimated from very few observations. Abnormal returns and significance tests calculated using the market model, a trade-to-trade adjusted market model and a trade-to-trade adjusted index model are available on request from the author.