An Empirical Analysis of Capital Structure and Abnormal Returns

Gulnur Muradoglu[*] and Sheeja Sivaprasad

Cass Business School, London

12th March 2007

Abstract

This study is an empirical work that investigates whether capital structure is value-relevant for the equity investor. In this sense, the paper links empirical corporate finance issues with investment analysis. We integrate the Miller-Modigliani framework (1958) into an investment approach by estimating abnormal returns on leverage portfolios in the time-series for different risk classes. For most risk classes, abnormal returns decline in firm leverage. However, abnormal returns increase as average leverage in a risk class increases. The separation of the average level of external financing in an industry and of that in a particular firm is important. Utilities for which Miller-Modigliani (1958) report their empirical results (i.e., that returns increase in firm leverage) are in fact risk classes with high concentrations and firm leverage ratios very close both to one another and to the industry average. In the *Utilities* risk class, abnormal returns increase in firm leverage. For other risk classes, this is not the case and abnormal returns decline in firm leverage and increase in industry leverage. Results are robust with regard to other risk factors.

Keywords: Leverage, Capital Structure, Investment

We thank Alec Chrystal, Mark Flannery and the participants at the Asian Finance Association in Kuala Lumpur and the Australian Finance and Banking Conference in Sydney, Australia for their helpful comments and suggestions on this and earlier versions of the paper. All remaining errors are ours.

[*] Corresponding Author. Cass Business School, 106 Bunhill Row, London, EC1Y 8TZ, United Kingdom. Tel:+44 2070400124 Fax: +44 2070408881, e-mail:g.muradoglu@city.ac.uk.

1. Introduction

This study is an empirical work that investigates whether capital structure is value-relevant for the equity investor. In this sense, the paper links empirical corporate finance issues with investment analysis. The results show that low-debt companies have significant abnormal returns, which are extremely high for the smallest companies. Miller-Modigliani (1958)[1] report evidence of a positive relationship between equity returns and leverage in selected industries. Evidence in the cross-section of all stocks is mixed: Bhandari (1988) report a positive relationship while empirical evidence reported by Korteweg (2004) and Masulis (1983) is negative. Fama and French (1992) find that market leverage is positively associated with returns, while book leverage is negatively related. Therefore, they argue that the difference between the two measures, book-to-market equity, helps to explain average returns. DeAngelo et al. (2006) explain that although high leverage mitigates agency problems, it also reduces financial flexibility because the utilisation of the current borrowing capacity translates into less availability in the future.

We integrate MM into an investment approach by estimating abnormal returns on leverage portfolios in the time-series for various risk classes as defined by the industries they operate in. We estimate the effect of leverage on abnormal returns in a cross-section of firms, taking into account several risk factors, including book-to-market and others described by Fama and French (1992). Results are robust with regard to other risk factors. We show that equity returns increase in leverage for some risk classes but decrease in leverage for others. We find that firms in risk classes such as the utilities and oil & gas sectors have abnormal returns that increase in leverage. These results are consistent with the findings of MM, who employ these industries in

[1] Hereafter referred to as MM.

their empirical tests. Firms in most other risk classes experience abnormal returns that decrease in leverage, supporting the findings of authors who use mixed samples of firms.

Theoretical finance has always regarded debt as one of the principle sources of financial risk. According to MM's seminal work on capital structure, firm value is independent of financing decisions. The authors rigorously show that the value of a firm is determined by the rate of return on real assets—and not by the mix of securities that are issued. An immediate implication of MM's propositions on equity returns is that they should increase in leverage. This is indeed the case in the cross-section of firms in a certain risk class of *Utilities* and *Oil & Gas* industries as revealed by the authors' findings. Additionally, following similar studies by Bradley et al (1984), Titman(1984),Hull(1999),Lang et al(1996), Mackay et al (2005) based on leverage and industry classification, we classify our sample industry wise to examine the impact of firm and industry leverage on cumulative abnormal returns.

In MM, equity returns are represented by the average cost of capital in a one-year period and estimations are conducted in a cross-section of a particular risk class. We represent equity returns as cumulative abnormal returns for a holding period of one year, which representation is easier for an investor to interpret. We use panel data that contains information for a 25-year period and combines the cross-section with the time series. In MM, the only independent variable is the leverage ratio and its square to test the linearity of the relationship. In our study, in addition to the leverage ratio and its square, we use five additional variables that reflect idiosyncratic risk, including the risk factors described by Fama and French (1992) and the particular environment's cost of borrowing in order to account for changes in the cost of capital in the time series that explain abnormal returns. MM conduct their tests within two industries, each representing a coherent risk class, namely the oil and utilities sectors. We, however, do not limit our research simply to two sectors. Instead, our study encompasses all non-financial firms across the nine sectors that cover all the various classes of risk.

Hamada (1972) tests the relationship between a firm's leverage and its common stock's systematic risk over a cross-section of all firms. He uses industry as a proxy for business risk, since his sample lacks a sufficient number of firms to yield statistically significant coefficients. Our sample size enables us to undertake cross-sectional analysis separately for each risk class. Bradley et al (1984) also suggested that industrial classification is a good proxy for business risk across industries. We also control for business risk by regressing abnormal returns on beta (i.e., market risk) as well as on leverage and other risk factors. By utilising an additional examination of pure capital structure changes, Masulis (1983) shows that change in leverage is positively related to change in stock returns. He studies daily stock returns following exchange offers and re-capitalisations where recapitalisations occur at a single time. However, his work also contains limitations. His sample contains a group of all companies that have gone through pure capital structure changes, which might represent a certain risk class itself. Therefore, one must be careful in assuming that characteristics of firms in this sub-sample are representative of all firms. In this study, we study abnormal returns in a panel that includes the cross-section of all firms in all risk classes.

Bhandari (1988) indirectly tests the second of MM's propositions by examining whether expected common stock returns are positively related to the ratio of debt in the cross-section of all firms without assuming various industry-defined risk classes. His results provide evidence that leverage has a significant positive effect on expected common stock returns. His returns are adjusted for inflation, whereas our abnormal returns are market-adjusted, but using interest rates as an explanatory variable to account for changes in the cost of capital in the time series. Bhandari (1988) controls for idiosyncratic risk through size and beta; in addition to these variables, we utilise two others: price-to-book and price-earnings ratios. Korteweg (2004) also tests the aforementioned MM proposition. His tests are based on pure capital structure changes (i.e., exchange offers). He controls for business risk by assuming non-zero debt betas and uses a time series approach. In our study, we use a cross-sectional approach to test whether leverage is value-relevant by investigating excess returns generated by holding portfolios based on a company's leverage. Since our sample is not limited and includes a cross-section of all firms, we do not assume zero debt betas and avoid additional assumptions when calculating separate debt betas and asset betas. Hull (1999) measures market reaction to common stock offerings with the sole purpose of debt reduction and reports a negative immediate response—increasingly more so for firms further from the industry norm. Our sample is not as limited as Hull's and includes a cross-sectional examination of all firms. Additionally, we do not employ a short-run perspective. While Hull measures immediate wealth maximisation using three-day cumulative returns, we assume a one-year holding period for our portfolios, which assumption is in keeping with MM and Schwartz (1959).

Dimitrov and Jain (2005) measure the effect of leverage changes on stock returns as well as on earnings-based measures of performance. Their results reveal a negative correlation between debt-to-equity ratio and risk-adjusted stock returns. The authors study how changes in levels of debt are negatively associated with contemporaneous and future-adjusted returns. In this paper, we investigate the ability of leverage to predict stock returns by using a cross-section of these ratios rather than changes over time. Also, we do not distinguish between the operating and investing activities of a firm, as we are concerned with the excess returns an investor can make from the overall activities of a company in a one-year investment horizon.

Miao (2005) develops an industry model of equilibrium between capital structure choices and production decisions made by firms facing idiosyncratic technological shocks. His results show that technology (i.e., productivity) is important in determining a firm's probability of survival and leverage ratio. His work also looks into understanding the theoretical impact of financing policies on firm turnover. In this paper, we classify our sample according to industry in order to study cross-sectional cumulative abnormal returns. We do not individually address the financing needs or production decisions of each industry.

Following Miller (1977) and Myers (1977), there is considerable work that investigates the determinants of change in capital structure and the stability of capital structure choices and reversions over time. Mayer and Sussman (2004), for example, find clear evidence that capital structure reverts back to previous levels of leverage following a spike in investment. Flannery et al. (2004) show that firms do in fact observe target capital structures. They argue that it is 'targeting behaviour' which explains changes in firms' capital structures rather than the pecking-order theory (Myers 1984) or the market-timing theory, as posited by Myers (1984) and Baker et al. (2002), respectively. Alti (2006) finds that hot-market firms leverage ratios increase significantly two years following the IPO; however, cold market firms appear to be content with the leverage ratios they attain at the IPO. He concludes that market timing is an important determinant of financing activity in the short-run but that its long-run effects are limited. Ahn et al. (2006) investigate the relationship between investment patterns and leverage. They show that firms with diversified investments have higher leverage than firms with more focused investments. This study investigates neither the determinants of multiple capital structure choices nor changes in capital structures over time. Our main goal is to explore the effect of capital structure on cumulative abnormal returns. In doing so, we control for idiosyncratic risk factors commonly used in investments. These risk factors include price-earnings ratio (Campbell and Schiller (1988)), size (Banz (1981) and Chan and Chen (1991)), book-to-market ratio (Chan, Hamao and Lakonishok (1991)) and a combination of these, including beta (Fama and French (1992; 1996)).

We also investigate the impact of industry leverage on stock returns. Schwartz (1959) explains that the optimal capital structure varies for firms in different industries because asset structures and stability of earnings, which determine inherent risk classes, vary for different types of production. We argue that industry leverage should prove useful in predicting the direction and magnitude of stock returns when investors evaluate a stock's true worth. Bradley et al (1984) found that 54% of the cross-sectional variance in firm leverage ratios can be explained by industrial classification. They suggested that industrial classification is a good proxy for business risk. Titman (1984) concludes that firms manufacturing machines and equipment should be financed with relatively less debt. Titman et al (1988), while examining the determinants of capital structure, find that debt levels are negatively related to the uniqueness of a firm's line of business. While our model does not study the determinants of capital structure, we do examine the relevance of industry leverage on stock returns. Hull (1999) examines how stock value is influenced by changes in a firm's leverage relative to its industry leverage. He measures industry leverage in terms of the median leverage for a given industry. Following Bradley

(1984), we measure industry leverage as the average leverage for an industry. Unlike Hull, we do not investigate changes of a firm's leverage relative to its industry leverage. Instead, we are more concerned of how a firm's leverage and its particular industry's leverage can have an impact on an investor's portfolio performance. Undoubtedly, a firm's capital structures decisions are influenced by the industry in which the firm exists. Mackay et al. (2005) investigate the importance of industry with regard to a firm's real and financial decisions. They find that industry-related factors other than industry fixed effects can partly explain the variation of financial structures amongst competitive industries. Hou et al. (2006) examine the effect of industry concentration and average stock returns. After controlling for determinants such as size, book-to-market and momentum they find that firms in more competitive industries earn higher stock returns. In this paper, we examine a firm's cumulative average abnormal returns by measuring leverage at the firm level and at the average level for the firm's industry. We also examine other factors, such as size, price-earnings, market-to-book and betas.

In Section 2, we describe the rationale behind our sample-selection procedure, variables used and the methodology applied to our study. The results are presented in Section 3. Finally, Section 4 presents the conclusions and discusses the scope of possibilities for further research.

2. Data and Methodology

The source for all of our data is Datastream. We begin with all 2673 companies listed in the London Stock Exchange from 1965 to 2004. The requirement for each firm year observation to enter the sample is the availability of a fiscal year-end debt ratio and stock price series for at least the twelve months preceding the given year. Financial companies including banks, investment companies, insurance/life assurances and companies that change the fiscal period's end date during the research period are excluded. 1092 financial companies are hence removed. 490 companies are removed because they do not have matching year-end leverage ratios and stock prices for all subsequent years. A further 173 companies with short quotation experience are removed. Finally, a further 126 companies with a market value of less than 1 million is removed. The resulting sample contains 7954 firm year-end observations from 792 companies listed from 1980 onwards.

Our sample firms are grouped into different risk classes using the four-digit industry classifications. Within each industry classification—and for the full sample—firms are ranked according to the leverage that is available from annual reports with year-end dates of December 31 or prior, yearly. We use the capital gearing definition (Datastream code: WC08221) to represent the leverage of companies in the sample. It represents the total debt to total financing of the firm and is defined as:

$$\text{Leverage (\%)} = \frac{\text{Long term debt+ Short term debt \& Current Portion of Long term debt}}{\text{Total Capital+ Short term debt \& Current Portion of Long term debt}} \qquad (1)$$

Schwatz (1959) argues that the narrow definition of financial structure—i.e., that it is restricted to stocks and bonds—ignores the large measure of substitutability between the various forms of debt; thus, a broader definition encompassing the breadth of all liabilities and claims of ownership must be used. He proposes the ratio of total debt to net worth as the best single measure of gross risk. Firms in various industries have different asset structures that are financed by cash flows generated from various forms of debt and equity. The use of both variables' book values ensures that we measure the capital structure via the cash flows generated at the time those assets are financed. Schwartz (1959) also argues that an optimum capital structure for a widely held company is one which maximises the long-run value of the common stock per share. Our analysis is based on the same understanding. The use of book values for debt and equity has the additional advantage of using the market value of equity neither to define the change in value nor in concurrent capital structure. Following Fama and French (1992), we account for the difference between the two by using book-to-market ratio as a risk factor. Kayhan et al. (2006) suggested that the significance of the historical book-to-market in leverage regressions may be due to the noise in the current book-to-market.

We use a company's market value (Datastream code: MV) to represent company size. Market capitalisation is the share price multiplied by the number of ordinary shares in issue. The price-to-book value (Datastream code: PTBV) refers to a company's share price divided by the net book value. The price-earnings ratio (Datastream code: PER) refers to the ratio of price to earnings. The market risk measure is the beta coefficient (β), which we estimate over a five-year period in a rolling window using monthly data. We also take into account the impact of market conditions on capital structure by examining interest rates. Interest rate (Datastream code: LCBBASE) is the average monthly Bank of England (BoE) rate observed over the portfolio holding period.

We classify each risk class into nine main industries as per the datastream industry classification. These are: oil & gas (0001), basic materials (1000), industrials

(2000), consumer goods (3000), healthcare (4000), consumer services (5000), telecommunications (6000), utilities (7000) and technology (9000). The *Oil & Gas* industry (0001) includes oil & gas producers and the oil equipment and services sectors. The *Basic Materials* industry (1000) includes the sectors of chemicals, forestry and paper, industrial metals and mining. The sectors of construction and materials, aerospace and defence, general industries, electronic and electric equipment, industrial engineering and industrial transportation belong to the *Industrials* industry (2000). The *Consumer Goods* industry (3000) comprises the sectors of automobiles and parts, beverages, food producers, household goods, leisure goods, personal goods and tobacco. The *Healthcare* industry (4000) includes the sectors of health care equipment and services, pharmaceuticals and biotechnology. The food and drug retailers, general retailers, media and travel and leisure sectors belong to the *Consumer Services industry* (5000). The *Telecommunications industry* (6000) includes the sectors of fixed-line telecommunications and mobile telecommunications. The *Utilities industry* (7000) includes the sectors of electricity and gas, water and multi-utilities. The *Technology industry* (9000) includes the sectors of software and computer services and technology hardware and equipment.

Stock returns for each company are calculated monthly using percentage change in consecutive closing prices adjusted for dividends splits and rights issues (Fama et al. (1969)). Cumulative Abnormal Returns ($CAAR_{i,t}$) on portfolios are calculated starting on May 1 each year as follows: Abnormal return on day t for stock i is given as $AR_{i,t} = R_{i,t} - E(R_{i,t})$, where $R_{i,t}$ is the monthly return of the share i on day t; and $E(R_{i,t})$ is the expected return on stock i in day t, which is represented by the return on FTSE-All share index. Cumulative abnormal returns (CAARs) are calculated for the 12 months following the period of portfolio formation and t-tests

(Brown and Warner (1985) and Campbel, Lo and MacKinley (1997)) are used to test if CAARs are significantly different from zero using the following equations:

$$CAAR_t = \sum_{i=1}^{n} \sum_{t=1}^{12} AR_{i,t} \quad (1)$$

$$t = \frac{CAAR_T}{s(CAAR)_T} \quad (2)$$

where $s(CAAR_T) = s(AR_T)/(T+1)^{1/2}$; and $s(AR_T)$ is the variance over T months.

The next step in our analysis is to determine whether cumulative abnormal returns at the stock level can be explained by the leverage of the firms and to examine a number of idiosyncratic risk factors in the cross-section and interest rates that control for changes in cost of capital within the environment of the time series. Idiosyncratic risk factors include: market risk; size price-to-earnings ratio; and price-to-book ratio. First, we run the below regression in the full sample. Then we partition the data according to the different risk classes represented by each industry, formally testing for the effect of leverage in each risk class while accounting for the effect of these additional factors on CAARs.

$$CAAR_{i,t} = a + b_1 LEVERAGE_{i,t} + b_2 BETA_{i,t} + b_3 SIZE_{i,t} + b_4 BM_{i,t} + b_5 PE_{i,t} + b_5 INTEREST_{i,t} + \varepsilon_t \quad (3)$$

In equation (3), CAAR is defined as in equation (1); *a* stands for constant; LEVERAGE[2] is measured as the ratio of total debt to total equity plus debt; BETA is the market risk estimated over the preceding five years; SIZE refers to the log of total market capitalisation; BM and PE refer to the ratio of price-to-book and the ratio of price to earnings respectively; INTEREST refers to the average monthly Bank of

[2] Alternative specifications of equation (3), including the square of the leverage variable, were estimated to test for the linearity of the relationship. In most estimations, the squared values of this variable are statistically insignificant and hence are not reported here. These results are available upon request.

England (BoE) rate over the portfolio holding period; and ε is the error term. We estimate equation (3) using GMM estimators[3] and fixed effects for firms.[4] GMM estimators ensure that no assumptions are made about the variables' distributional properties, most of which are not normally distributed. Following Flannery et al. (2004), we use fixed effects for firms in the panel to account for the richness of individual firms' unique information and for the possibility of varying degrees of risk acceptance in ownership decisions (Schwartz (1959)).

For the full sample, portfolio assignments are made annually based on the leverage of the firm in each industry. For risk-class sub-samples, firms in each industry are ranked according to the leverage that is available from annual reports with year-end dates of December 31 or prior, yearly. The number of company year observations in each decile varies between eight and fifty seven and in the panel we have about seven hundred and ninety observations in each decile. To ensure that we avoid forward-looking biases, the annual decile assignments are made according to the available information as of May 1 of the following year, at which point all of the annual reports are published. Next, we sort the leverage deciles according to price-earnings (PE) ratios, decile 1 denoting the lowest PE and decile 10 the highest. We repeat the exercise with sub-samples based on size (SIZE), which is defined as total market capitalization of the company, price-to-book ratio (PTBV) and market risk (BETA).

Panel A in Table 1 presents the descriptive statistics for the five variables: cumulative average abnormal returns (CAARs); leverage; price-earnings ratio; price-to-book; market value; and beta. CAARs and beta are calculated from monthly data;

[3] Alternative estimations were made using OLS. Conclusions do not change and are hence not reported. Results are available upon request.
[4] Alternative estimations were made using random effects. Conclusions do not change and are hence not reported. Results are available upon request.

leverage, price-earnings ratio, price-to-book and market values are as of year end. The sample's mean and the median CAARs are 3.34% and 3.02%, respectively. The distribution is highly dispersed with a standard deviation of 40.1% and a range between -232% and 849%. As can be clearly observed from the JB statistic, non-normality exists in the data set with a skewness coefficient of 1.72 and a kurtosis coefficient of 33.72. The mean and median of the leverage are quite similar, at 27.15% and 25.86%, respectively. The standard deviation is 19.45% with a range between 0% and 99.67%. The leverage has a skewness coefficient of 0.63 and a kurtosis coefficient of 0.63; the JB statistic shows normality and is not rejected. The mean and median of the price-earnings ratio are disparate, at 26.08 and 14.90 times, respectively, and the skewness and kurtosis coefficients are high with the JB test accordingly indicating non-normality. The standard deviation is also quite high (97 times), indicating highly dispersed observations. The price-to-book ratio has a mean of 3.43 times and a median of 1.89 times. The standard deviation is high (12.42 times), indicating a highly dispersed distribution with high skewness and kurtosis coefficients and, thus, non-normality as indicated by the JB test. Size measured as the logarithm of companies' market capitalization has a mean of 2.20 and a median of 2.10 with a standard deviation of 0.77. The skewness and kurtosis coefficients are 0.64 and 2.98, respectively, and the JB test indicates non-normality. Beta coefficients have a mean of 0.82 and a median of 0.83 with a standard deviation of 0.52. The distribution of beta coefficients is negatively skewed; the kurtosis coefficient is high; and the JB statistic indicates non-normality. The annual interest rates have a mean of 7.45% and a median of 5.96% with a standard deviation of 3.23%. The lowest observed annual interest rate is 3.71% (in 2003) and the highest is 15.25% (in 1980). The kurtosis and skewness coefficients are 2.77 and 0.94, respectively, and the JB test indicates non-normality. Later, we consider the properties of the sample in empirical estimations using Generalised Methods of Moments (GMM) to carry out cross-sectional regressions that include all the variables in our study.

Panel B in Table 1 reports the descriptive statistics of firm leverage for each risk class. The leverage in the *Oil & Gas* industry has a mean and median of 23.99% and 22.45%, respectively, with a standard deviation of 16.59% and a minimum ranging from 0% to 65.82%. The skewness and kurtosis coefficients are 0.17 and 1.98, respectively, and the JB test indicates non-normality. The correlation of firm leverage to the average industry leverage is 0.31. The *Basic Materials* industry has a mean and median of 27.48% and 27.94%, respectively, with a standard deviation of 15.67% and a minimum ranging from 0% to 97.15%. The skewness and kurtosis coefficients are 0.78 and 5.42, respectively, and the JB test indicates non-normality. The correlation of firm leverage to the average industry leverage is 0.15. The leverage in the *Industrials* sector has a mean and median of 28.38% and 27.50%, respectively, with a standard deviation of 18.88% and a minimum ranging from 0% to 99.67%. The skewness and kurtosis coefficients are 0.55 and 3.14, respectively, and the JB test indicates non-normality. The correlation of firm leverage to the average industry leverage is 0.23. The *Consumer Goods* industry has a mean and median of 27.79% and 27.06%, respectively, with a standard deviation of 18.61% and a minimum ranging from 0% to 91.69%. The skewness and kurtosis coefficients are 0.52 and 3.06, respectively, and the JB test indicates non-normality. The correlation of firm leverage to the average industry leverage is 0.24. The *Healthcare* industry has a mean and median of 26.63% and 23.45%, respectively, with a standard deviation of 19.96% and a minimum ranging from 0% to 89.06%. The skewness and kurtosis coefficients are 0.55 and 2.59, respectively, and the JB test indicates non-normality. The correlation of firm leverage to the average industry leverage is 0.22. The leverage in the *Consumer Services* industry has a mean and median of 25.25% and 22.36%, respectively, with a standard deviation of 21.19% and a minimum ranging from 0% to 98.88%. The skewness and kurtosis coefficients are 0.80 and 3.24, respectively, and the JB test indicates non-normality. The correlation of firm leverage to the average industry leverage is 0.23. The *Telecommunications* industry has a mean and median of 27.84% and 24.65%, respectively, with a standard deviation of 20.80% and a minimum ranging from 0% to 91.43%. The skewness and kurtosis coefficients are 1.03 and 3.94, respectively, and the JB test indicates non-normality. The correlation of firm leverage to the average industry leverage is 0.46, which finding is quite high. The *Utilities* industry has a high mean and median, at 40.07% and 43.07%, respectively, with a standard deviation of 17.94% and a minimum ranging from 0.03% to 92.36%. The skewness and kurtosis coefficients are -0.04 and 3.29, respectively, and the JB test indicates non-normality. The correlation of firm leverage to the average industry leverage is 0.58. The mean and median leverage in the *Technology* industry is 18.57% and 13.10% with a standard deviation of 19.12% and a minimum ranging from 0% to 95.54%. The skewness and kurtosis coefficients are 1.33 and 4.69, respectively, and the JB test indicates non-normality. The correlation of firm leverage to the average industry leverage is 0.28.

*****insert table 1 *****

3. Empirical Results

3.1. Leverage and Cumulative Average Abnormal Returns

Table 2 reports Cumulative Average Abnormal Returns (CAARs). Stock returns for each company are calculated monthly using percent change in consecutive closing prices that have been adjusted for dividends splits and rights issues (Fama et al. (1969)) across the leverage deciles for the entire sample as well as for each risk class. Decile 1 contains the firms with the lowest leverage and decile 10 contains those with the highest. For the overall sample, the mean debt ratio for low debt firms is 0.28%; for high debt firms it is 62%. The mean leverage increases monotonically to 5% in decile 2, then to 12% in decile 3. Deciles 4 and 5 have a mean leverage of 18% and 24%, respectively. The mean debt ratio in decile 6 is 29%; decile 7 has a mean leverage of 34%; and deciles 8 and 9 have mean leverages of 39% and 46%, respectively.

*****insert table 2 here*****

Cumulative abnormal returns for the overall sample at the end of the twelve month holding period are presented in column 3 of Table 1. Figure 1 presents the CAARs for each leverage decile monthly over the 12-month holding period. For the overall sample, the CAAR for low levered firms of decile 1 is 6.28%. On the other hand, firms in decile 10 (i.e., those with the highest leverage) earn CAARs that are not significantly different from zero. For the overall sample, the CAAR decrease as leverage increases. Firms in deciles 2 and 3 earn 6% and 6.49%, respectively, during the holding period. Cumulative abnormal returns decrease to 3.52% and 5.54% for firms in deciles 4 and 5, respectively; then decline continues for deciles 6, 7 and 8, reaching 2.3%, 1.84% and 2.6%, respectively. Cumulative abnormal returns are not significantly different from zero for firms in deciles 9 and 10. If leverage were used as a trading strategy and an investor were to invest in the lowest leverage firms with an average debt burden of 0.28%, he would be able to earn a cumulative abnormal return of 6.28% in one year's time and a staggering 491% during the 24-year research period. Alternatively, if he were to invest in firms with the highest leverage and carry an average debt burden of 62%, he would earn a negative annual average abnormal return of -0.99%, which, with annually rebalanced portfolios, would amount to a loss of 78% during the 24-year research period.

*****insert Figure 1 here*****

In Table 2, columns 4 through 12 and Figure 2 present CAARs for each leverage decile within each risk class. Cumulative average abnormal returns decline in leverage for the *Consumer Goods, Consumer Services* and *Industrials* industries. For the *Consumer Goods* industry (which includes firms in the automobile and parts, beverages, food producers, household goods, leisure goods, personal goods and tobacco sectors), CAARs of firms in the lowest leverage decile are 7.48% while CAARs of firms in the highest leverage decile are not significantly different from zero. For the *Consumer Services* industry (which includes firms in the food and drug, general retailers, media and travel and leisure sectors), firms with the lowest leverage earn CAARs of 10.30% in one year, while firms in the highest leverage decile earn CAARs of -3%. In the *Industrials* industry (which includes firms in the constructions and materials, aerospace and defence, general industries, electronic and electric equipment, industrial engineering and industrial transportation sectors), firms in the lowest leverage decile earn CAARs of 3.55%, while CAARs for those in highest leverage decile are not significantly different from zero. These results are consistent with the results of the overall sample.

*****insert Figure 2 here*****

Firms in the *Basic Materials* industry exhibit CAARs that are U-shaped in leverage. (The *Basic Materials* industry includes firms in the chemicals, forestry and paper, industrial metals and mining sectors.) Those firms with the lowest leverage earn CAARs of 5.18% and those with highest leverage earn 9.07%, while firms in decile 5 earn negative CAARs of -1%. In this risk class, CAARs are U-shaped in leverage: CAARs are high for firms with either very low or very high leverage, while they are either low or negative for firms with leverages closer to the median.

Firms in the *Healthcare* industry exhibit CAARs that are either negative or very low for the very low levered and highly levered deciles, while firms with leverage ratios near the median enjoy high CAARs. (The *Healthcare* industry includes firms in the healthcare equipment and services, pharmaceuticals and biotechnology sectors.) Those firms with lowest leverage earn CAARs of -2.28% and firms with highest leverage earn -1.28%, while firms in decile 5 earn CAARs of 9% and those in decile 8 earn CAARs of 31%.

Firms in the *Telecommunications* industry exhibit CAARs that are positive and high for the lowest levered firms; the CAARs in the highest leverage decile earn positive but lower CAARs. (The *Telecommunications* industry includes firms in the fixed-line telecommunications and mobile telecommunications sectors.) Those firms with the lowest leverages earn CAARs of 44.81% and those with the highest leverages earn 18.14%. Firms in deciles 5 and 8 earn CAARs of 1.17% and 11.17%, respectively.

The *Technology* industry reveals high but negative CAARs in the lowest leverage decile and low but positive CAARs in the highest leverage decile. (Firms in the *Technology* industry include those in the software and computer services and technology hardware and equipment sectors.) Those firms in the lowest leverage decile earn CAARs of -13.23% and firms in the highest leverage decile earn 0.64%. Firms in decile 5 and 8 earn CAARs of 10.09% and 16.88%, respectively.

The *Utilities* industry exhibits CAARs that are high but negative in the lowest leverage decile and positive but lower CAARs in the highest leverage decile. (Firms in the *Utilities* industry include those in the electricity and gas, water and multi-utilities sectors.) Firms in the lowest decile earn -15.56% in the 1st decile and those in the highest decile earn 8.91%. Firms deciles 5 and 8 earn 8.78% and 2.07%, respectively.

The *Oil and Gas* industry is the only risk class in which CAARs increase in leverage. (Firms in the *Oil and Gas* industry include those in the oil and gas producers and oil equipment and services sectors.) Companies with the lowest leverage earn negative CAARs of -2.3%; firms in decile 5 earn 3.95%; and firms with the highest leverage earn 6.52%. These results are consistent with MM. The *Oil & Gas* industry is the sector that contains the highest average leverage ratios and in which the leverage ratios in the cross-section of the industry's firms are least dispersed.

We understand from the above analysis that the relationship between leverage and holding period returns is not the same for all risk classes. For most risk classes, CAARs decrease in leverage; firms with low leverage ratios can earn significantly higher CAARs than can firms with high leverage. For others, the relationship between leverage and CAARs is U-shaped; CAARs are high for the highest and lowest levered firms. Only for the *Oil and Gas* industry do CAARs increase in leverage. This is consistent with the theoretical model of MM as well as with their empirical tests conducted for this risk class in the U.S. We show that this is not the case for the other risk classes.

There is a considerable amount of literature on the differences in leverage due to industry characteristics. Brown et al. (1982) show that there is a difference between mean industry capital structures and that each industry tends to have an optimal debt ratio due to tax benefits. Bradley et al. (1984) report that leverage decreases with R&D expenditures. Barclay et al. (1995) illustrate that leverage is high for regulated firms and low for high-tech industries. Campello (2003) provides evidence that firms that rely on debt are more likely to reduce their investment in market share-building during downturns. Hull (1999) shows that industry debt-to-equity ratio is a useful benchmark with which investors can evaluate a stock's attractiveness. We show that the relationship between leverage and CAARs is not consistent across industries. Later, when we run regressions, we use the average industry debt ratio as a separate, independent variable in order to explain CAARs.

Since MM, other risk factors have been introduced which have become popular in academic as well as practitioner-oriented contexts. Various studies have defined investment strategies based on momentum (Lakonishok et al. (1994) and Debondt and Thaler (1995)), price-earnings ratio (Campbell and Schiller (1988)), size (Banz (1981) and Chan and Chen (1991)), book-to-market ratio (Chan, Hamao and Lakonishok (1991)) or a combination of these factors (Fama and French (1992; 1996)) as determinants in investors' value maximisation. Of course, the question arises whether leverage ratio is the sole contributing factor or rather only one of the contributing factors in the cumulative returns. Below, we will undertake a series of tests in order to investigate if other factors or combination thereof could have contributed to the obtained results.

3.1.1 Are the Results Calendar-Varying?

Table 3 reports the results of the year-by-year analyses of portfolios formed during the research period. Overall, we do not observe any dependence on calendar time with regard to the relationship between leverage and CAARs. When the CAARs of the portfolios formed during the 1980's, 1990's and 2000's are investigated, we observe (consistent with the results of the overall sample) that firms in the lower leverage deciles with moderately lower leverage levels outperform the market when compared to companies with higher leverage. However, there are a few exceptions. For example, in 1987, the year of the stock market crash, companies with the highest leverage outperform the market when compared to companies with the lowest leverage. In 1993 and 2001, years of technology bubbles, companies with the highest debt ratio outperform companies with the lowest leverage. The UK markets experience high interest volatility during the research period. The range of interest rates in the environment during this period is between 3.7% and 15.3% yearly. For example, in 1987 interest rates are low and debt is comparatively cheap for companies to procure. Companies might have used this opportunity to increase their leverage. In 1993 and 2001, interest rates drop considerably, making debt cheaper and more attractive for companies to meet their financing needs. Later, when we run regressions, we take the cost of debt in the particular environment into account by using interest rate as an explanatory factor for CAARs.

*****insert Table 3 here*****

3.2 Leverage and Market Risk

Table 4 reports CAARs for portfolios based on leverage as well as on market risk. Overall, cumulative abnormal returns are higher for companies with low market risk and low leverage. For example, companies in the lowest beta coefficient decile and the lowest debt decile earn excess returns of 8.33%, while companies in the highest market risk and highest leverage deciles earn negative abnormal returns of -3%. Companies with high beta coefficients and low debt levels earn high abnormal returns of up to 14.21%, while companies with high beta coefficients and high leverage earn negative abnormal returns as low as -5.28%. Companies with low market risk earn positive abnormal returns in most leverage levels, with higher abnormal returns for lower debt levels.

*****insert Table 4 here*****

3.3 Leverage and Price-Earnings Ratio

Table 5 reports CAARs for portfolios based on leverage and price-earnings (PE) ratios. Overall cumulative abnormal returns are higher for companies with low leverages and low PE ratios. For example, companies in the lowest PE and lowest leverage deciles outperform the market by 16.51% in one year, while companies in the highest leverage and highest PE deciles under-perform, with CAARs of -7.47%. Cumulative abnormal returns are positive for all leverage levels for low PE firms, although CAARs decline from 16.51% in the lowest leverage and lowest PE deciles to 5.52% for firms in the highest leverage and lowest PE deciles. Similarly, for firms in the highest PE ratio decile, CAARs decline from 3.27% for low leverage firms to -7.49% for the highest leverage firms.

*****insert Table 5 here*****

3.4 Leverage and Price-to-Book Ratio

Table 6 reports CAARs for portfolios based on leverage and price-to-book value (PTBV). Our results indicate that CAARs are higher for companies with low leverage and low PTBV. For example, companies in the lowest leverage and lowest PTBV deciles outperform the market by 20% and 24%, respectively, while companies in the highest leverage and highest PTBV deciles have abnormal returns that are not significantly different from zero. CAARs for companies in the lowest PTBV decile are positive and significant in all leverage deciles, while CAARs for companies in the highest PTBV decile are not significantly different from zero in any leverage decile. In all leverage deciles, CAARs decrease in PTBV.

*****insert Table 6 here*****

3.5 Leverage and Size

Table 7 reports CAARs for portfolios based on leverage and size. Our results indicate that CAARs are slightly higher for small companies with low leverage. The smallest companies (in size decile 1) earn abnormal returns between 8% and 14% if they have leverage ratios below the median, and between 6% and -3% if they have leverage ratios above the median. Large companies earn slightly lower CAARs, ranging between -4% and 3.5% yearly.

*****insert Table 7 here*****

Cross-Sectional Regression Results

Table 8 reports the results of the cross-sectional regressions for the full sample as well as for the different risk classes. Considering the properties of the sample, we run the regressions in panel using GMM estimators[5] with whitening in the cross-section. We use firm fixed effects[6] following Flannery et al. (2004) so as to account for the richness of firm-specific information. Coefficients for fixed effects are significant in all estimations. For the overall sample, cross-sectional regressions reveal a negative and significant relationship between leverage and cumulative abnormal returns. Cumulative abnormal returns decline in leverage. A 1% increase in leverage is associated with a 0.1% decline in CAARs. All other variables, including

[5] We repeat the estimations using OLS panel estimators. Results (not reported here) do not alter conclusions.
[6] We repeat the estimations with random effects for the full sample and all sub-samples, as well as industry fixed effects for the full sample. Results (not reported here) do not alter our conclusions.

price-earnings ratio, price-to-book ratio, size, beta and interest rates[7], have negative and significant coefficients. CAARs are higher for low PE, low BTMV, low beta and small companies as well as during periods of low interest rates. Although we account for the effect of several idiosyncratic and macro-economic risk factors, the negative effect of leverage on CAARs remains significant.[8]

We repeat the estimations for all risk classes. The coefficients for interest rates and size are negative and significant across all risk classes. The coefficients for PE, PTBV and beta are either negative and significant or insignificant for all risk classes. Only the coefficient estimates for leverage have different signs for different risk classes. Coefficient estimates for leverage are negative and significant for *Consumer Goods, Consumer Services* and *Industrial* firms. In the *Consumer Goods* sector CAARs decline by about 0.33% per 1% increase in leverage. In the *Consumer Services* industry, CAARs decline by about 0.18% per 1% increase in leverage. For *Industrial* companies, CAARs decline by about 0.15% per 1% increase in leverage. This is consistent with the results of the overall sample. For all other risk classes, except for *Utilities*, coefficient estimates for leverage are not statistically significant. In the *Utilities* risk class, the coefficient estimate of leverage is positive and significant. CAARs decline by about 0.5% per 1% increase in leverage. This is consistent with the results reported by MM, who reveal a coefficient estimate of 0.006 in this industry.

*****insert Table 8 here*****

[7] We repeat estimations with a interaction term between leverage and beta and find that the coefficient estimates for the interaction terms are not significant in most of the cases.
[8] We repeat all the estimations with backward and forward stepwise regressions. Results (not reported here) do not alter our conclusions.

Table 9 reports the results for the regressions with one additional explanatory variable: the average industry leverage. Similar to results reported in Table 8, coefficient estimates are either significantly negative or insignificant for all other variables except for firm leverage and industry leverage. The coefficient estimate for firm leverage is negative for the overall sample and positive for industry leverage. This finding illustrates that CAARs are higher for companies with lower debt ratios, while CAARs are higher during periods with higher overall industry leverage. Per 1% increase in firm leverage, CAARs decrease by 0.22%, while they increase by about 1.1% per 1% increase in a firm's risk class's average leverage.

This is an interesting result, as it implies that MM's proposition—that returns increase in leverage—holds true for overall increases in leverage in a risk class, while for individual firms that increase in leverage, returns fall—as shown in more recent studies (Korteweg (2004)). The separation of the average level of an industry's external financing and that of a particular firm is important. The *Utilities* and *Oil & Gas* sectors for which MM report their empirical results are in fact the two sectors in the U.K. that have high concentration ratios with firm leverage ratios very close both to each other and to the industry average. For other risk classes, this is not the case and the results reported by Korteweg (2004), using a cross-section of all firms, reflects this.

*****insert Table 9 here*****

Next, we run regressions for each risk class. For the *Consumer Goods, Consumer Services* and *Industrials* risk classes, CAARs are higher for firms with low leverage, while CAARs are higher for periods with higher averages of industry leverage. For companies in *Consumer Goods, Consumer Services* and *Industrial* sectors, the coefficient estimates for level of firm leverage are 0.5%, 0.3% and 0.25%, respectively, and 1.71%, 1.79% and 1.57% for the average level of leverage in the risk class. For the firms in the *Technology* risk class, the coefficient for the average industry leverage is positive with a coefficient estimate of 1.57%, while the coefficient estimate for firm leverage is not significantly different from zero. These results are consistent with those of the overall sample. For two risk classes—*Basic Materials* and *Healthcare*—the coefficient estimates for average industry leverage are negative, while the coefficient estimates for firm leverage are not significantly different from zero. For the *Oil & Gas* risk class, both coefficients are positive but insignificant. For *Utilities*, the coefficient estimate for firm leverage remains positive but declines from 0.5% to 0.35%, while the coefficient estimate for industry leverage is positive and insignificant.[9] Clearly, the empirical results of MM for the *Utilities* industry are supported by our findings. This could be because *Utilities* is a highly regulated and capital intensive industry; hence, the industry's debt requirements could be higher than the other risk classes. A possible explanation for the discrepancy between the empirical results of MM for this one specific risk class and more recent work of Korteweg (2004) and George et al. (2006), that uses a cross-section of all firms, could lie in ignoring changes in average leverage within each risk class.

4. Conclusion

This study is an empirical work that shows that equity returns increase in leverage for some risk classes and decrease in leverage for others. Firms in industries such as *Utilities*, that MM employ in their empirical tests, have abnormal returns that increase in leverage. Firms in most other industries experience abnormal returns that

[9] We run alternative regressions using all the other variables and industry average leverage as the only leverage variable (excluding the firm leverage variable). Coefficient estimates for average industry leverage have the same significance levels and signs as in Table 9, except that the coefficient estimate for *Utilities* remains positive and significant.

decrease in leverage, which supports the findings of authors using mixed samples of firms. We also show that a risk class's average level of leverage has additional explanatory power. For most risk classes, abnormal returns increase as the average leverage level increases. *Utilities,* for example is one risk class where we observe a positive relationship between leverage and abnormal returns. This could be because *Utilities* is a highly regulated and capital intensive industry and thus the industry's debt requirements could be higher than that in other risk classes. A possible explanation for the discrepancy between the empirical results of MM for this one specific risk class and more recent work of Korteweg (2004) and George et al. (2006), that uses a cross-section of all firms, could lie in ignoring changes in average leverage within each risk class.

We acknowledge the fact that debt requirements for each risk class differ and that certain heavy industries require a higher leverage, while also acknowledging that average leverage levels within a risk class may differ due to macroeconomic factors such as interest rates, yet each company within a risk class may have its own unique reasons for a capital structure preference. Our results are robust with regard to other risk factors. CAARs decline in PE, PTBV, size, market risk and interest rates. Firms' capital structure policies appear to be largely consistent with the existence of leverage targets. Because capital structure is endogenous, we argue that the optimal financial policy is one that advocates low leverage, so as to mitigate agency problems while preserving financial flexibility. Profitable firms may keep their leverage levels low so as to prevent too a proportion of profit being used for interest payments. This notion leads to another school of thought: i.e., whether firms, in their attempt to keep leverage levels low, avoid taking on profitable opportunities and investments, hence throwing away their firm value. The negative relationship between returns and leverage could also be due to the market's pricing of the firm's ability to raise funds if need be.

Further avenues for research in this area include examining the stock return performance of companies based on the changes in leverage of the firms relative to their risk classes. It would be particularly noteworthy to examine the rate at which the information content of said changes is incorporated in the share prices of companies as well as in their long run returns. Research could also be undertaken to study the existence of a level optimal industry leverage separate from that of optimal firm leverage. An optimal industry debt ratio would indicate whether firms in the industry actually outperform the market when they adhere to this optimal industry leverage ratio.

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Table 1: Summary Statistics

This table presents the descriptive statistics for our sample. We have a total of 7954 year-end observations for a sample of 792 companies for the period 1980-2004. Stock returns for each company are calculated on a monthly basis and are defined as the percentage difference of consecutive closing prices adjusted for dividends, splits and rights issues. The returns are accumulated from May of year *t* over a one-year period (CAARs). Leverage is observed as of the beginning of May of year *t* (Datastream Code: WC08221). It represents the total debt to total financing of the firm and is defined as in equation (1). The price-earnings ratio (Datastream code: PER) is the price divided by the earnings rate per share and is taken as of the beginning of May of year *t*. The price-to-book value (Datastream code: PTBV) of companies is the share prices of companies divided by the net book value and is observed as of the beginning of May of year *t*. The market value (Datastream code: MV) of companies represents the size factor of companies in the sample. This is the share price multiplied by the number of ordinary shares in issue as of the beginning of May of year *t*. The market risk measure is the beta coefficients estimated over five years using monthly data and is observed as of the beginning of May of year *t*. Interest rates are obtained from Datastream (Code: LCBBASE). The interest rates observed as of the beginning of May of year *t* to the end of April of year *t+1* are averaged over the 12-month period. Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*. All non-financial companies listed on London Stock Exchange (LSE) which meet the criteria of the data requirements for the research study are allocated to the 10 debt portfolios. Each debt group is then subdivided into 10 price-earnings portfolios, followed by 10 price-to-book portfolios, then 10 size portfolios, and finally 10 beta portfolios. Average industry leverage ratios are calculated by averaging the leverage of each company in each industry sector in May of year *t*. Correlation refers to the correlation of firm leverage with average industry leverage.

Panel A : Full Sample

	CAARs	Leverage	Price/ Earnings	Price-to-Book	Size	Betas	Interest
Mean	3.34	27.15	26.08	3.43	2.20	0.82	7.45
Median	3.02	25.86	14.90	1.89	2.10	0.83	5.96
Std dev.	40.07	19.45	97.34	12.42	0.77	0.52	3.23
Kurtosis	33.72	3.20	488.29	973.39	2.98	5.00	2.77
Skewness	1.72	0.63	19.08	27.40	0.64	-0.12	0.94
Minimum	-231.86	0.00	0.60	0.12	1.00	-2.53	3.71
Maximum	849.36	99.67	3777.80	581.61	5.26	2.97	15.25
JB statistic	316803.9*	531.5484*	78533994*	3.130008*	550.8656*	1342.717*	1200.058*

Panel B: Firm leverage in each risk class

	Oil & Gas	Basic Materials	Industrials	Consumer Goods	Healthcare	Consumer Services	Telecommunications	Utilities	Technology
Mean	23.99	27.48	28.38	27.79	26.63	25.25	27.84	40.07	18.57
Median	22.45	27.94	27.50	27.06	23.45	22.36	24.65	43.07	13.10
Std dev.	16.59	15.67	18.88	18.61	19.96	21.19	20.80	17.94	19.12
Kurtosis	1.98	5.42	3.14	3.06	2.59	3.24	3.94	3.29	4.69
Skewness	0.17	0.78	0.55	0.52	0.55	0.80	1.03	-0.04	1.33
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
Maximum	65.82	97.15	99.67	91.69	89.06	98.88	91.43	92.36	95.54
JB statistic	8.917684*	160.1422*	181.5267*	47.91025*	11.66175*	208.3096*	25.97397*	0.508862*	136.4232*
Correlation	0.31	0.15	0.23	0.24	0.22	0.23	0.46	0.58	0.28

* indicates significance at 1%

Table 2: Leverage and Cumulative Average Abnormal Returns

Table 2 reports the average leverage and CAARs for a holding period of 12 months for each leverage decile for the full sample and for each risk class. We have a total of 7954 year-end observations for a sample of 792 companies for the period 1980-2004. Stock returns for each company are calculated on a monthly basis and are defined as the percentage difference of consecutive closing prices adjusted for dividends, splits and rights issues. The returns are accumulated from May of year *t* over a one-year period (CAARs). Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*. The first column shows the average leverage for each decile. The second column shows the average cumulative abnormal returns (CAARs).Leverage is obtained from Datastream (Datastream Code: WC08221). It represents the total debt to total financing of the firm and is defined as in equation (1). Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*. All non-financial companies listed on London Stock Exchange (LSE) which meet the criteria of the data requirements for the research study are allocated to the 10 leverage portfolios. Leverage decile 1 (LOW) represents the firms with the lowest leverage while decile 10 (HIGH) represents firms with the highest leverage. The second column shows the average leverage for each group. The third column shows the average cumulative returns (CAARs). Here we broadly classify the 82 sectors into nine main industries as per Datastream classification: oil & gas (0001), basic materials (1000), industrials (2000), consumer goods (3000), healthcare (4000), consumer services (5000), telecommunications (6000), utilities (7000) and technology (9000). We sort the sample companies industry-wise as per the Datastream classification and then rank the debt level of each company in each industry from low to high.

		CAARs									
Leverage deciles	**Average Leverage**	**Full Sample**	**Basic Materials**	**Consumer Goods**	**Consumer Services**	**Healthcare**	**Industrials**	**Oil & Gas**	**Technology**	**Telecommunications**	**Utilities**
1 (LOW)	0.28	6.28*	5.18*	7.48*	10.30*	-2.28*	3.55*	-2.30	-13.23*	44.81*	-15.56*
2	4.59	6.00*	6.18*	6.96*	10.05*	8.08*	4.02*	12.15*	2.52*	-4.94*	1.38*
3	11.68	6.49*	-1.16*	1.02*	10.98*	5.82*	3.13*	8.67*	10.37*	-10.05*	5.10*
4	17.97	3.52*	5.46*	-0.60	10.20*	1.47*	5.33*	18.45*	0.39	7.54*	-3.32*
5	23.62	5.54*	-0.90*	-2.17*	0.98*	8.54*	4.26*	3.95*	10.09*	1.17*	8.78*
6	28.88	2.3*	1.58*	-2.42*	4.99*	4.87*	2.60*	6.48*	26.06*	-0.99*	-2.46*
7	33.76	1.84*	1.40*	-1.29*	1.74*	-1.50*	-0.12	2.83*	16.37*	12.36*	4.28*
8	39.01	2.6*	-5.07*	-1.24*	-1.57*	30.83*	4.73*	2.45*	16.88*	11.17*	2.07*
9	45.78	0.42	1.10*	-6.56*	2.51*	2.84*	1.86*	4.27*	-2.99*	0.73	4.46*
10 (HIGH)	61.54	-0.99	9.07*	0.96	-3.00*	-1.28*	0.82	6.52*	0.64	18.14*	8.91*
Grand Total	27.15	3.34	2.34	0.22	4.70	5.54	3.01	6.35	6.54	8.16	1.42

Table 3: CAARs and Leverage on a One-Year Holding Period

Table 3 reports the results of the year-by-year analysis of portfolios formed from 1980-2004. We have a total of 7954 year-end observations for a sample of 792 companies for the period 1980-2004. The first column shows the cumulative average abnormal returns (CAARs).Stock returns for each company are calculated on a monthly basis and are defined as the percentage difference of consecutive closing prices adjusted for dividends, splits and rights issues. The second column denotes the average leverage. Leverage decile 1 (LOW) represents the firms with the lowest leverage while decile 10 (HIGH) represents the firms with the highest leverage. Leverage is obtained from Datastream (Datastream Code: WC08221). All non-financial companies listed on London Stock Exchange (LSE) which meet the criteria of the data requirements for the research study are allocated to the 10 leverage portfolios. Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*.

	May-80		May-81		May-82		May-83		May-84		May-85		May-86		May-87	
Leverage Deciles	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage
1 (LOW)	17.07*	0.09	15.90*	0.16	-0.20	0.54	1.13	0.72	-4.70	0.70	7.44*	0.51	12.96*	0.68	10.48*	0.48
2	22.91*	2.97	5.81*	2.30	1.46	3.16	1.44*	3.69	6.67*	4.62	1.71	3.93	8.78*	3.98	10.69*	3.67
3	19.22*	8.83	7.30*	6.97	-9.67*	8.44	4.10	8.89	4.69	9.37	24.20*	7.71	-6.26*	9.15	18.6*	8.95
4	15.97*	12.71	-0.35	11.33	-2.24	13.15	1.43	12.35	4.94	14.75	15.82*	10.71	4.43*	13.47	12.16*	14.97
5	13.59*	14.75	-9.51*	14.36	-11.94*	15.16	-8.13*	15.52	4.83	18.88	17.42*	16.48	8.46*	17.00	14.61*	20.28
6	6.59*	17.60	0.06	16.45	2.82	18.09	5.62*	18.43	6.81*	21.38	5.11	19.78	7.36*	21.08	7.09*	24.62
7	0.81	20.67	10.89*	20.33	-9.08*	22.54	-0.23	21.20	6.20*	23.23	7.28*	22.47	9.57*	24.12	15.39*	28.02
8	-7.01*	24.41	-0.94	24.18	2.69	24.95	13.18*	24.72	18.60*	28.53	21.96*	25.97	5.25*	28.09	9.08*	30.93
9	8.29*	28.23	1.47	27.24	-5.73	28.66	10.10*	30.24	4.93*	34.46	10.38*	30.85	9.04*	33.37	8.72*	36.34
10 (HIGH)	-3.20	35.61	-7.31*	34.55	-5.21	34.32	6.96*	37.35	-16.70*	48.23	0.97	41.62	11.25*	49.48	20.39*	49.10

	May-88		May-89		May-90		May-91		May-92		May-93		May-94		May-95	
Leverage Deciles	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage
1 (LOW)	7.30*	0.42	-15.00*	1.52	-0.15	0.70	20.55*	0.82	8.58*	0.35	8.68*	0.12	-9.90	0.08	2.84	0.09
2	3.12*	5.87	-2.61	7.92	1.26	8.02	0.63	7.28	16.37*	6.61	14.89*	4.26	-1.07	3.66	13.58*	3.67
3	2.44*	12.35	-11.68*	13.68	-17.92*	13.87	6.60*	14.82	12.35*	13.79	15.20*	11.19	-11.05*	11.37	8.82*	11.87
4	1.21	16.87	-12.32	18.78	4.98	18.94	5.22*	20.42	4.69*	19.69	14.76*	16.52	-5.11	16.30	3.80*	18.75
5	0.01	21.68	-17.66*	23.55	-9.83*	23.63	3.60*	24.24	4.61*	24.67	9.06*	21.21	-1.82	20.81	12.53*	23.32
6	-3.06*	26.53	-19.38*	28.97	-1.58	28.72	-0.36	28.50	8.70*	29.00	9.22*	25.86	13.49*	25.58	-1.76*	27.62
7	-8.87*	30.34	-18.32*	33.11	-1.14	33.62	9.36*	32.82	-2.15	33.56	10.98*	30.47	-12.01	30.20	4.43*	32.07
8	-6.54*	36.02	-12.75*	37.32	-13.39*	39.30	3.23	37.31	1.30	38.44	12.14*	35.37	-7.38	35.10	-1.43	37.91
9	-3.87*	44.23	-28.53*	43.73	-6.03*	45.47	10.01*	43.27	-1.85	45.62	9.75*	41.05	13.89*	41.00	1.75	44.63
10 (HIGH)	-10.29*	60.26	-49.53*	60.32	-22.97*	62.00	15.42*	55.21	-1.83	59.68	16.50*	55.63	10.67	56.89	-1.24	62.25

	May-96		May-97		May-98		May-99		May-00		May-01		May-02		May-03	
Leverage Deciles	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage	CAARs	Average Leverage
1 (LOW)	-1.60	0.08	-27.41*	0.11	1.12	0.15	30.25*	0.10	8.52*	0.11	4.73*	0.09	10.21*	0.04	30.34*	0.14
2	-3.16	3.56	-26.39*	3.78	-13.18*	3.84	23.27*	3.43	6.11*	3.00	18.26*	4.95	4.05*	4.80	26.10*	4.62
3	4.93*	10.85	-11.02*	11.66	-0.35	11.59	23.22*	10.92	3.86	10.13	10.83*	12.85	10.22*	12.64	29.33*	12.33
4	-7.02*	18.06	-26.52*	17.48	-13.01*	-11.03	12.07*	18.30	13.22*	17.86	8.41*	20.00	-0.86	19.63	29.34*	19.83
5	-0.69	24.14	-7.81*	23.88	-8.81*	25.14	9.69*	24.88	24.17*	24.77	20.13*	26.79	3.77*	27.15	20.30*	26.87
6	-6.34*	28.99	-13.89*	29.56	-10.88*	30.46	3.81	31.08	13.86*	31.86	18.97*	32.88	0.25	34.24	23.58*	32.43
7	-5.29*	32.80	-12.70*	33.88	-14.72*	35.79	-4.38*	37.71	10.29*	37.87	16.59*	39.33	13.46*	40.02	23.57*	37.92
8	-8.56*	37.89	-11.19	39.22	-13.24*	41.99	5.64*	43.40	10.85*	43.96	16.88*	45.33	3.10*	45.65	23.96*	43.48
9	-12.45*	43.43	-12.25*	47.24	-16.63*	48.82	12.51*	50.83	13.38*	51.62	13.13*	52.27	-0.70	53.15	20.06*	52.12
10 (HIGH)	-6.56*	59.99	-10.71*	65.86	-18.55*	67.28	15.71*	68.02	-3.57	69.31	16.65*	70.74	1.31	72.24	25.05*	72.89

Table 4: Leverage and Beta

Table 4 reports the results of the portfolios based on leverage ratio and beta for 1980-2004. Leverage is observed as of the beginning of May of year *t* (Datastream Code: WC08221). It represents the total debt to total financing of the firm. The market risk measure is the beta coefficients estimated over five years using monthly data and is observed as of the beginning of May of year *t*. Stock returns for each company are calculated on a monthly basis and are defined as the percentage difference of consecutive closing prices adjusted for dividends, splits and rights issues. The returns are accumulated from May of year *t* over a one-year period (CAARs). The CAARs of all non-financial companies listed on London Stock Exchange (LSE) which meet the criteria of the data requirements for the research study are allocated to the 10 leverage portfolios. Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*. Each leverage decile is subdivided into 10 beta portfolios. Leverage decile 1 (LOW) denotes firms with the lowest leverage ratios and Leverage decile 10 (HIGH) represents firms with the highest leverage. Beta decile 1 represents low risk firms and beta decile 10 represents firms with high risk.

					LEVERAGE DECILES					
Beta Decile	**1 (LOW)**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10 (HIGH)**
1 (LOW)	8.33*	8.43*	7.88*	8.65*	13.68*	7.02*	-2.10*	9.26*	-2.64*	5.73*
2	6.12*	9.32*	-0.66*	-0.17*	7.91*	1.60*	9.63*	4.48*	-2.73*	-6.20*
3	2.75*	2.02*	5.36*	4.35*	5.64*	2.75*	0.13*	4.71*	-2.61*	8.26*
4	3.76*	2.13*	9.30*	1.88*	3.82*	2.10*	-1.60*	0.86*	7.68*	-0.99*
5	-3.34*	6.17*	4.95*	0.26*	10.44*	-1.78*	3.08*	3.91*	0.85*	0.16*
6	7.90*	4.33*	4.95*	-0.55*	5.87*	-0.69*	-2.10*	-2.56	0.58*	3.80*
7	13.24*	2.64*	11.79*	-1.56*	1.90*	4.60*	7.24*	-0.74	-2.66*	-5.61*
8	9.57*	6.06*	7.44*	6.75*	1.96*	3.58*	2.16*	0.14*	9.54*	-2.16*
9	-1.32*	4.98*	8.71*	0.54*	0.73*	4.03*	3.55*	2.37*	-1.60*	-6.31*
10 (HIGH)	14.21*	9.90*	6.05*	13.83*	4.34*	-1.29*	-0.56*	3.84*	-5.28*	-2.95*
Grand Total	6.51	5.77	6.49	3.52	5.60	2.24	1.84	2.60	0.42	-0.99

Table 5: Leverage and Price-Earnings Ratio

Table 5 reports the results of the portfolios based on leverage and price-earnings ratio for 1980-2004. Leverage is obtained as of the beginning of May of year *t* (Datastream Code: WC08221). It represents the total debt to total financing of the firm. The price-earnings ratio (Datastream code: PER) is the price divided by the earnings rate per share and is taken as of the beginning of May of year *t*. Each leverage group is subdivided into 10 price-earnings portfolios. Leverage decile 1 (LOW) denotes the lowest leverage and leverage decile 10 (HIGH) represents firms with the highest leverage. P/E decile 1 denotes firms with the lowest price-earnings ratio and P/E decile 10 contains firms with the highest price-earnings ratio. Stock returns for each company are calculated on a monthly basis and are defined as the percentage difference of consecutive closing prices adjusted for dividends, splits and rights issues. The returns are accumulated from May of year *t* over a one-year period (CAARs). Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*. All non-financial companies listed on London Stock Exchange (LSE) which meet the criteria of the data requirements for the research study are allocated to the 10 leverage portfolios.

					LEVERAGE DECILES					
P/E Decile	**1 (LOW)**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10 (HIGH)**
1 (LOW)	16.51*	7.81*	17.36*	6.57*	14.20*	5.51*	3.47*	2.86*	7.75*	5.52*
2	9.59*	12.14*	6.78*	9.70*	1.99*	1.58*	5.85*	2.56*	-3.34*	(3.53)*
3	3.15*	4.70*	9.83*	3.13*	10.07*	6.52*	-1.03*	-1.64*	-1.62*	2.54*
4	3.94*	11.08*	1.07*	8.95*	5.83*	0.53*	-0.53*	3.46*	2.51*	(2.62)*
5	12.15*	-3.22*	4.52*	-1.23*	2.84*	3.54*	3.98*	3.90*	-5.57*	1.18*
6	9.39*	6.56*	6.89*	-7.69*	5.16*	-1.45*	-0.84*	-0.75*	3.44*	2.11*
7	7.00*	6.99*	1.14*	3.86*	0.41*	1.55*	0.29*	0.83*	-1.92*	(2.23)*
8	4.10*	10.60*	5.70*	0.89*	6.24*	2.92*	-0.16*	1.40*	5.63*	(6.24)*
9	1.79	-1.51	0.83	1.89	2.52	0.55	0.22	5.76	1.20	-0.70
10 (HIGH)	3.27*	3.47*	9.46*	10.67*	8.00*	0.50*	10.42*	7.15*	-0.06*	(7.47)*
Grand Total	6.51	5.77	6.49	3.52	5.60	2.24	1.84	2.60	0.42	-0.99

Table 6: Leverage and Price-to-Book

Table 6 reports the results of the portfolios based on leverage and price-to-book ratio for 1980-2004. Leverage is obtained as of the beginning of May of year *t* (Datastream Code: WC08221). It represents the total debt to total financing of the firm. The price-to-book value (Datastream code: PTBV) of companies is the share prices of companies divided by the net book value and is observed as of the beginning of May of year *t*. Stock returns for each company are calculated on a monthly basis and are defined as the percentage difference of consecutive closing prices adjusted for dividends, splits and rights issues. The returns are accumulated from May of year *t* over a one-year period (CAARs). Portfolios are formed yearly at the beginning of May in year *t* until the end of April of year *t+1*.All non-financial companies listed on London Stock Exchange (LSE) which meet the criteria of the data requirements for the research study are allocated to the 10 leverage portfolios. Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*. Each leverage group is subdivided into 10 price-to-book ratio portfolios. Leverage decile 1 (LOW) denotes firms with the lowest leverage and leverage decile 10 (HIGH) represents firms with the highest leverage. PTBV decile 1 denotes firms with the lowest price-to-book ratios and PTBV decile 10 denotes firms with the highest price-to-book ratios.

					LEVERAGE DECILES					
PTBV Decile	**1 (LOW)**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10 (HIGH)**
1 (LOW)	19.58*	24.04*	15.25*	6.79*	15.59*	5.27*	12.98*	9.72*	7.96*	23.64*
2	8.97*	4.33*	15.50*	2.77*	6.44*	0.45*	5.11*	1.81*	1.83*	2.07*
3	3.93*	8.14*	4.52*	4.46*	9.80*	7.21*	4.70*	-3.62*	9.76*	3.73*
4	3.45*	7.25*	11.61*	8.89*	-0.22*	-2.65*	9.61*	0.71*	-5.54*	11.44*
5	14.08*	7.35*	6.90*	4.47*	4.85*	12.77*	-1.16*	3.38*	3.75*	-7.28*
6	13.86*	-1.37*	3.67*	2.38*	3.76*	2.42	0.23	-0.63	-1.21	-7.72*
7	5.20*	-1.61*	5.56*	0.56*	7.02*	2.33*	-3.09*	4.54*	4.33*	-14.52*
8	5.15	8.52	3.26	5.60	5.44	-6.58	-5.91	4.28	-6.22	-10.56
9	1.37*	0.21*	-8.17*	-4.20*	-5.57*	-0.37*	-5.32*	-0.59*	-7.32*	-6.63*
10 (HIGH)	-2.65	5.25	6.54	0.58	2.08	-4.26	-5.17	5.88	-4.22	-0.18
Grand Total	6.51	5.77	6.49	3.52	5.60	2.24	1.84	2.60	0.42	-0.99

Table 7: Leverage and Size

Table 7 reports the results of the portfolios based on leverage and size for 1980-2004. Leverage is observed as of the beginning of May of year *t* (Datastream Code: WC08221). It represents the total debt to total financing of the firm. The market value (Datastream code: MV) of companies represents the size factor of companies in the sample. This is the share price multiplied by the number of ordinary shares in issue as of the beginning of May of year *t*. Stock returns for each company are calculated on a monthly basis and are defined as the percentage difference of consecutive closing prices adjusted for dividends, splits and rights issues. The returns are accumulated from May of year *t* over a one-year period (CAARs). All non-financial companies listed on London Stock Exchange (LSE) which meet the criteria of the data requirements for the research study are allocated to the 10 debt portfolios. Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*. Each leverage group is subdivided into 10 portfolios. Decile 1 (LOW) denotes firms with the lowest leverage and decile 10 (HIGH) represents firms with the highest leverage. Size decile 1 denotes the smallest firms and size decile 10 denotes the largest firms.

					LEVERAGE DECILES					
Size Decile	**1(LOW)**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10(HIGH)**
1(SMALL)	8.13*	11.20*	9.95*	14.02*	10.40*	1.87*	4.58*	6.64*	-2.81*	0.05*
2	7.47*	6.38*	10.55*	9.89*	5.92*	6.00*	-0.84*	-0.74*	-2.45*	-4.64*
3	9.51*	4.34*	7.06*	8.61*	7.38*	-0.47*	2.08*	-1.22*	2.82*	6.12*
4	1.27*	8.57*	12.18*	1.30*	11.83*	4.49*	7.06*	9.33*	-0.28*	-4.37*
5	9.79*	5.68*	2.13*	1.17*	1.81*	1.66*	-2.50*	8.25*	2.30*	-11.10*
6	8.73*	6.17*	7.97*	-0.79*	4.46*	-0.04*	2.82*	6.31*	1.71*	-0.50*
7	5.23	5.20	-0.60	-4.17	6.43	1.39	1.63	0.12	3.91	-10.88
8	6.71*	-1.28*	5.47*	0.94*	2.26*	3.77*	2.55*	1.03*	1.79*	7.28*
9	-6.84*	5.87*	5.40*	6.45*	3.96*	3.79*	0.07*	0.20*	-2.36*	0.92*
10(BIG)	-3.99*	0.84*	-0.99*	0.31*	3.42*	1.08*	3.33*	0.50*	-1.96*	3.49*
Grand Total	6.51	5.77	6.49	3.52	5.60	2.24	1.84	2.60	0.42	-0.99

Table 8: Regressions I

Table 8 reports the cross-sectional regression results on monthly stock returns and leverage, size, price-earnings ratio, price-to-book ratios, market risk (beta) and industry sector classifications. The overall sample consists of 7954 observations of 792 non-financial companies for the period 1980-2004. We broadly classify these 82 sectors into nine main industries: oil & gas (0001), basic materials (1000), industrials (2000), consumer goods (3000), healthcare (4000), consumer services (5000), telecommunications (6000), utilities (7000) and technology (9000). We sort all the sample companies industry-wise in the aforementioned manner and then rank the leverage of each company from low to high in each industry. Cumulative Abnormal Returns are calculated using monthly returns for each portfolio for one year for the sample firms of 792 from 1980-2004. We use GMM estimators and fixed effects for firms with whitening in the cross-sections to undertake the regressions. Leverage is obtained from Datastream (DS CODE: WC08221) and represents the total debt to the total financing of the firms. Price-Earnings ratio is the price divided by earnings per share. Price-to-Book ratio represents price divided by its net book value. Size represents the market capitalisation of the companies. Market risk (beta) is the beta coefficients estimated over five years using monthly data. Interest rates are obtained from Datatream (Code: LCBBASE). The interest rates are observed as of the beginning of May of year *t* to the end of April of year *t+1* and are averaged over the 12-month period.

	C	Leverage	Price-Earnings	Price-To-Book	Size	Market Risk(Betas)	Interest Rates	R-sqred
Overall Sample	127.532***	-0.123***	-0.023**	-0.148*	-40.298***	-4.057***	-3.724***	0.247
Industry Classification								
Basic Materials	150.839***	0.507	-0.07***	0.656	-51.379***	-16.547	-2.928***	0.200
Consumer Goods	96.798***	-0.322***	-0.025***	-0.122**	-28.51***	-8.063***	-2.595***	0.220
Consumer Services	122.074**	-0.183**	-0.028*	-0.029	-36.700***	-4.551**	-3.687***	0.233
Health	174.539***	-0.057	0.145	-0.472	-60.776***	6.043	-5.970***	0.435
Industrials	124.254***	-0.148***	-0.018	(0.138)***	-40.469***	-1.556	-3.833***	0.242
Oil & Gas	112.883***	-0.158	-0.029***	(2.458)**	-24.383***	0.369	-4.632***	0.391
Technology	203.832***	-0.104	-0.1***	(0.415)***	-70.359***	-11.031***	-7.245***	0.348
Telecommunications	199.682***	0.410	-0.033**	-0.814	-56.653***	-6.768	-3.652*	0.489
Utilities	103.521***	0.457***	-1.318**	-3.249*	-31.534***	-8.009***	0.263	0.366

*** denotes 1% significance ** denotes 5% significance * denotes 10% significance

Table 9: Regressions II

Table 9 reports the cross-sectional regression results on cumulative average abnormal returns (CAARs) and average industry leverage, leverage, size, price-earnings ratio, price-to-book ratio and market risk (beta). The figures in parenthesis report the *t*-statistics for each variable. We have a total of 7954 year-end observations for a sample of 792 companies for the period 1980-2004. We broadly classify these 82 sectors into nine main industries: oil & gas (0001), basic materials (1000), industrials (2000), consumer goods (3000), healthcare (4000), consumer services (5000), telecommunications (6000), utilities (7000) and technology (9000). We use GMM estimators and fixed effects for firms with whitening in the cross-sections to undertake the regressions. We sort all the sample companies industry-wise in the aforementioned manner. Stock returns for each company are calculated on a monthly basis and are defined as the percentage difference of consecutive closing prices adjusted for dividends, splits and rights issues. The returns are accumulated from May of year *t* over a one-year period (CAARs).The CAARs of all non-financial companies listed on London Stock Exchange (LSE) which meet the criteria of the data requirements for the research study are allocated to the 10 leverage portfolios. Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*. Leverage is observed as of the beginning of May of year *t*. Leverage is obtained from Datastream (DS CODE: WC08221), represents the total debt to the total financing of the firms and is defined as in equation (1). Average industry leverage is calculated by averaging the leverage of each company in May of year *t* in each industry sector. The market value (Datastream code: MV) of companies represents the size factor of companies in the sample. This is the share price multiplied by the number of ordinary shares in issue as of the beginning of May of year *t*. The price-earnings ratio (Datastream code: PER) is the price divided by the earnings rate per share and is taken as of the beginning of May of year *t*. The price-to-book value (Datastream code: PTBV) of companies is the share price divided by the net book value and is observed as of the beginning of May of year *t*. The market risk measure is the beta coefficient estimated over five years using monthly data and is observed as of beginning of May of year *t*. Interest rates are obtained from Datatream (Code: LCBBASE). The interest rates are observed as of the beginning of May of year *t* to the end of April of year *t+1* and are averaged over the 12-month period. Interest rates are obtained from Datatream (Code: LCBBASE).

	C	Avg. Industry Leverage	Leverage	Price-Earnings	Price-To-Book	Size	Market Risk(Betas)	Interest Rates	R-sqred
Overall Sample	104.81***	1.14***	-0.22***	-0.02**	-0.13	-24.32***	-2.93***	-3.38*	0.26
Industry Classification									
Basic Materials	184.70***	-1.95*	0.58	-0.07***	0.68	-45.08***	-17.30	-2.53***	0.21
Consumer Goods	54.31***	1.71***	-0.46***	0.03***	0.14***	-32.85***	-6.41**	-1.73***	0.24
Consumer Services	95.58***	1.79***	-0.30***	0.02*	0.05	-45.59***	-3.33*	-3.33***	0.25
Healthcare	196.57***	-1.4*	0.04	0.14	0.49	-59.33***	6.18	-4.48***	0.44
Industrials	91.41***	1.57***	-0.25***	0.02	0.11**	-47.49***	-0.52	-3.15***	0.26
Oil & Gas	120.07***	0.46	0.07	-0.03***	(2.51)**	-24.40***	0.06	-4.31***	0.39
Technology	182.13***	1.57**	-0.2	-0.1*	(0.42)***	-68.98***	-9.82**	-8.77***	0.36
Telecommunications	180.85***	2.40***	-0.15	-0.03***	-0.70	-68.68***	-7.79	-3.39*	0.59
Utilities	99.74***	0.33	0.35**	-1.23**	(2.85)*	-35.86***	-5.7**	1.10	0.37

*** denotes 1% significance ** denotes 5% significance * denotes 10% significance

Figure 1

Figure 1 shows the cumulative average abnormal returns (CAARs) across the leverage deciles. Stock returns for each company are calculated on a monthly basis and are defined as the percentage difference of consecutive closing prices adjusted for dividends, splits and rights issues. The returns are accumulated from May of year *t* over a one-year period (CAARs). Leverage is observed as of the beginning of May of year *t* (Datastream Code: WC08221). It represents the total debt to total financing of the firm and is defined as in equation (1). The CAARs of all non-financial companies listed on London Stock Exchange (LSE) which meet the criteria of the data requirements for the research study are allocated to the 10 leverage portfolios. Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*. Leverage decile 1 denotes firms with the lowest leverage and leverage decile 10 represents firms with the highest leverage.

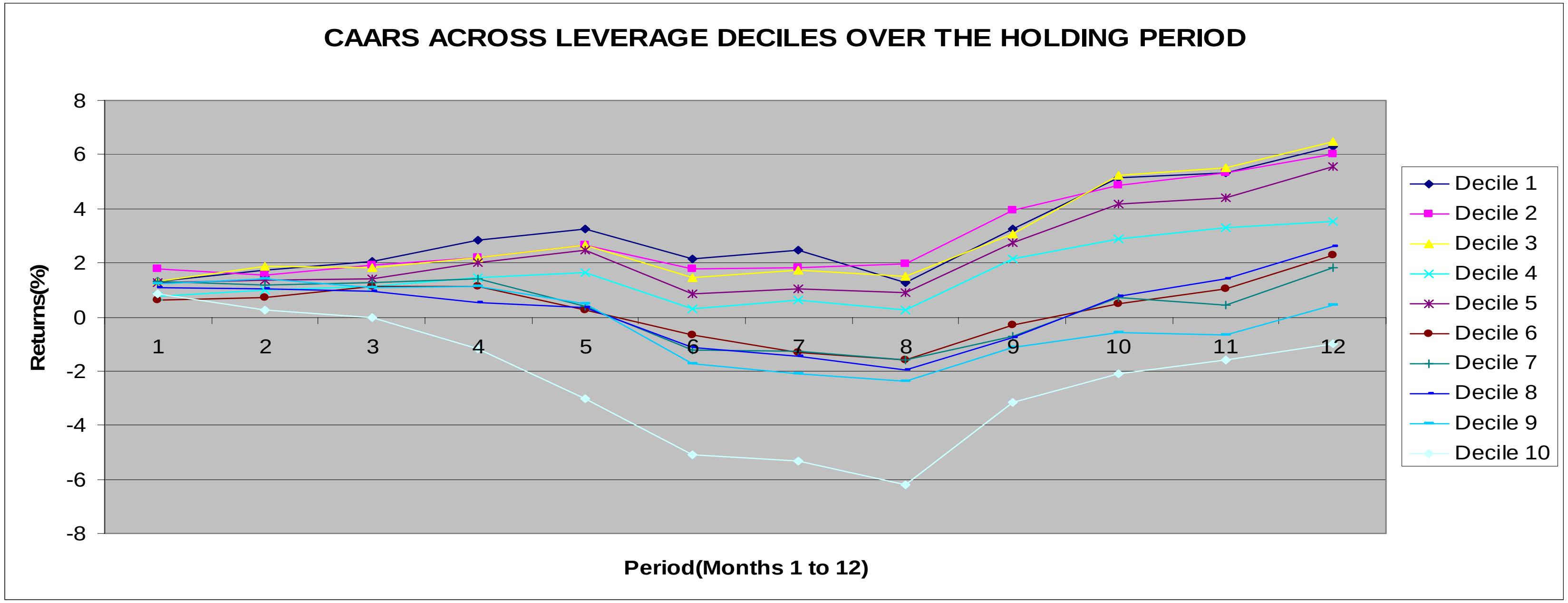

Figure 2

Figure 2 shows the cumulative average abnormal returns (CAARs) across the leverage deciles. Stock returns for each company are calculated on a monthly basis and are defined as the percentage difference of consecutive closing prices adjusted for dividends, splits and rights issues. The returns are accumulated from May of year *t* over a one-year period (CAARs). Leverage is observed as of the beginning of May of year *t* (Datastream Code: WC08221). It represents the total debt to total financing of the firm and is defined as in equation (1). The CAARs of all non-financial companies listed on London Stock Exchange (LSE) which meet the criteria of the data requirements for the research study are allocated to the 10 leverage portfolios. Portfolio assignments are made yearly at the beginning of May in year *t* until the end of April of year *t+1*. Leverage decile 1 denotes firms with the lowest leverage and leverage decile 10 represents firms with the highest leverage.