



www.ericjournal.ait.ac.th

Exploring Possible Effects of Changes in Capital Structure on the Market Value of Oil and Gas Companies

Hafez Abdo*¹ and Robert Wilkinson*

Abstract – This paper aims to test the effect of changes in capital structure on the market value of oil and gas companies. Tests are performed in order to see if changes in capital structure affect market value. These tests are performed on three dimensions: over the long-term (the 10 year period between 1998-2007); the short-term (for one year – 2006); and for announcements of changes in capital structure. The findings of the long-term test show no significant relationship between changes in capital structure and changes in market value. However, the short-term and announcement tests show a generally positive relationship between changes in capital structure and changes in a company's market value. This paper is one of the few to combine long-term and short-term tests to study the effect of changes in capital structure on oil companies' market value. Indeed, it is one of only a handful of papers which examine the capital structure of oil companies.

Keywords – Capital, market, oil, structure, value.

1. INTRODUCTION

Capital structure is that proportion of a firm's capital which is tied up in debt and equity [1]. Equity is usually ordinary shares and preference shares which are sold on the stock market. Debt is ordinarily borrowed money, usually in the form of bank loans or bonds.

Managers have to decide on a capital structure for their firm which takes into account the industry the firm operates in. The industry in which a firm operates has an impact on the capital structure: if the industry is characterised by a high level of business risk (*i.e.* profits are volatile), then the firm should avoid the high financial risk associated with high levels of borrowing (it risks bankruptcy if it is unable to service its debt requirements). Conversely, if an industry presents a low level of business risk and income streams are guaranteed, firms within that industry can afford to take on greater financial risk. Managers are therefore faced with the task of choosing a capital structure which is appropriate for the level of risk associated with their firms, but which will also increase its value and maximise shareholder wealth.

The traditional view used to be that the capital structure of a firm can add value and thereby maximise shareholder wealth. Managers can add value to the firm by lowering the weighted average cost of capital (WACC) by adding more debt finance to the capital structure. In theory, this should lower the WACC because interest payments on debt are lower than the required rate of return on equity finance provided by investors. The lowered WACC can then be used to discount the future cash flows of the firm, resulting in a higher net present value (NPV), thereby increasing the value of the firm. However, if debt levels become too

high, investors start to require greater returns for the greater risk; this in turn leads to an increase in the WACC, thereby lowering the value of the firm.

Disagreeing with this traditional view, Modigliani and Miller [2] suggested the *Irrelevance Theory* in connection to capital structure. They [2] proposed that the value of a firm is not dependent on its capital structure and that the WACC remains constant as debt levels increase. However, their argument was based on several significant assumptions. These assumptions were that there are no taxes, no transaction costs and firms operate in perfect markets. Most modern theories have been built upon the foundations of Modigliani and Miller's paper [2]. Ross's [3] *Signalling Theory*, Jensen and Meckling's [4] *Agency Theory* and Myers [5] *Pecking Order Theory* have all been built upon the back of Modigliani and Miller's pioneering work.

Research already carried out in this area is still inconclusive as to whether capital structure changes add value to a firm; for example, Masulis [6], Litzenberger [7] and Carpentier [8]. These studies are detailed in section 3.

The oil and gas industry is known to face high levels of risk in its upstream investment activities such as exploration, development and production. It is also expected within the industry that oil and gas prices and hence oil companies' profits will be significantly influenced by political events in oil producing countries, for example the Arab-Israeli war in 1973, the Iranian Revolution in 1979 and the Iraqi invasion of Kuwait in 1990. Fluctuations in oil prices drive fluctuations in oil and gas companies' profits, leading to variations in share prices. In other words, the value of an oil company is also subject to another type of risk – political risk. The oil and gas industry is famous for operating on a bigger scale than other industries in terms of capital employed, *i.e.*, equity and share capital. However, little research has been done to investigate the relationship between capital structure and the value of firms in the oil and gas

* Nottingham Business School, 6th Floor, Newton Building, Burton Street, Nottingham, NG1 4BU, United Kingdom.

¹Corresponding author;
E-mail: hafez.abdo@ntu.ac.uk

industry.

The objective of this paper, therefore, is to investigate the relationship between changes in the capital structure of oil and gas companies and their market values in the long-term, short-term and on a daily basis following an announcement of capital structure changes. We analyse the effect of changes in capital structure on firm market values using a sample of five oil companies over a ten year period (1998-2007). Our results will be tested against existing capital structure theories and compared with the results of previous studies. This investigation and its results may be of special interest to oil and gas companies, investors, analysts and others – achieving the optimal capital structure may increase a company's market value and attract more sources of finance at lower cost, leading in turn to higher profits and dividend payments and more investment. The methodology adopted here is unique in that it combines three levels of test as described above. This methodology may be applied in future research to study oil and gas companies in different regions, to examine companies over different time scales or to look at companies in other industries.

The other parts of the paper, than this section, is organised as follows: the second and the third parts are a literature review of the major capital structure theories and research already carried out in this area. Part Four presents the methodology and describes the data. Part Five presents and discusses the empirical testing and results of our research, and Part Six contains the conclusions.

2. CAPITAL STRUCTURE THEORIES

Modigliani and Miller

Modern day theories on capital structure started with Franco Modigliani and Merton Miller [2]; they developed a theory that challenged the traditional view of capital structure. The traditional view was that a firm will use its WACC as the discount rate against its future cash flows to calculate the NPV. The lower the WACC, the higher the NPV, and the higher the value of the firm. According to the traditional view, a firm can lower its WACC by increasing the amount of debt it has – the WACC drops because interest rates are lower than the rate of return required by investors, making debt cheaper than equity [9]. However, if the level of debt finance rises too high, investors will start to demand a greater return as recompense for the increased risk of bankruptcy.

Modigliani and Miller [2] posited two ideas that contradicted the traditional view. Their first proposition was that a firm's capital structure is independent of its value. The second proposition was that, if proposition one holds true, then the WACC of a firm will stay the same no matter what combination of debt and equity it chooses to have as its capital structure.

Modigliani and Miller's [2] second proposition is based on the fact that, as a firm becomes more geared, investors require a greater return in recognition of the riskier equity of that firm. As a result, the WACC of the

firm will remain constant because as the gearing ratio increases so does the required rate of return. The proposition assumes an economic environment where there are no taxes, no transaction costs, and perfect markets operate.

A number of researchers, most notably Durand [10] and Rose [11], criticised Modigliani and Miller for not taking account of taxes and for assuming that firms operate in a riskless environment. Durand [10] suggested that the value of an un-gearred firm is different from that of a geared firm in reality due to the risk associated with debt. Modigliani and Miller take no account of this in their propositions.

Modigliani and Miller [12] subsequently adjusted their paper to account for taxes within their calculations. They suggested that debt could reduce the WACC because of the tax benefits associated with debt finance. The tax advantage of debt is that interest payments are deducted before tax whereas with equity finance dividends are paid after tax. Modigliani and Miller [12] proposed that, as interest is paid before tax, interest payments reduce the taxable profits and, consequently, the tax payable is reduced, leading to higher after tax profits. While pointing out that firms gearing up their balance sheets to 99% could take full advantage of the associated tax benefit, Modigliani and Miller [12] stopped short of recommending this course of action because of the significantly increased risk of bankruptcy.

Models based on Agency Costs

Agency costs are costs arising from conflicts of interest within a firm (Fama and Miller [13]; Jensen and Meckling [4]). Jensen and Meckling [4] identify two major conflicts of interest within a firm. They are conflicts between shareholders and managers and between shareholders and debt holders.

Agency Theory models suggest that there is a positive correlation between a firm's value and its capital structure ([14] and [15]). These models can also be linked to Modigliani's and Miller's work [12]: Jensen [16], Harris and Raviv [14] and Stulz [15] all suggest that adding more debt to a capital structure can reduce conflicts of interest and thus increase the value of the firm.

Signalling Theory

Ross [3] and Leland and Pyle [17] developed one of the first models to link capital structure, firm value and asymmetric information. They suggested that as firms do not operate in efficient markets, managers have more information about how a firm is performing than investors do. Ross [3] and Leland and Pyle [17] theorised that the capital structure chosen by managers signals to outside investors the information that managers have on the inside. This is known as Signalling Theory. Ross [3] and Leland and Pyle [17] suggested that investors perceive an issue of equity as a sign of lower future cash flows, as equity does not have to be repaid and the dividends are optional. Accordingly, the share price of the firm will decline. Conversely, the

addition of more debt to the capital structure is perceived by investors as a signal of increased future cash flows (required to service the debt); consequently, the share price will increase. Thus, the theory suggests that there is a positive correlation between changes in capital structure and a firm's value.

Pecking Order Theory

Myers and Majluf [18] and Myers [5] developed the Pecking Order Theory. Myers and Majluf [18] suggested, like Ross [3], that investors are not as well informed about a firm's asset value as managers, and that this leads to the firm's equity being undervalued. Myers and Majluf [18] claim that if a firm is severely undervalued, issuing equity to fund a new project may create a situation where new investors realize more than the net present value of the project, at the expense of existing shareholders. Fear of such an outcome may lead to new projects being rejected even where they have a positive NPV. Underinvestment can be avoided by using funds that are not as severely undervalued; firms should use internal before external funds and then debt before equity if no internal funds are available. Myers [5] referred to this as the Pecking Order theory of finance.

Where a firm's capital structure is driven by investment in new projects according to the Pecking Order Theory, the firm can be said to be maximising shareholder wealth by increasing its value. The value of the firm goes up as it uses the cheapest source of finance available to reduce the WACC and increase the net present value of future cash flows.

3. PREVIOUS STUDIES

Litzenberger [7] observed the changes to capital structure in Phillips Oil and Unocal, and considered the effect of these changes on share price and ultimately firm value. He [7] found that recapitalisation, which increased the gearing of both companies, had no effect on the share price and value of Phillips Oil but in the case of Unocal it had an adverse effect on the market value of the company. His [7] results support the theory posited by Modigliani and Miller [2] that capital structure functions independently of firm value, and De Angelo and Masulis's theory [19] that increased gearing can have an adverse effect on firm value.

Conversely, Masulis [6] concluded that share prices and firm values are positively related to changes in debt levels and gearing; when gearing increases, so do the share price and the firm's value. Masulis [6] looked at daily returns after the announcement of a capital structure change to discover if there was a correlation between capital structure changing announcements and firm value. His results can be related to Agency Theory [4] and Signalling Theory [3]: adding debt reduces agency costs and acts as a positive signal to the market, thereby increasing firm's value.

Carpentier [8] tested the Irrelevance Theory proposed by Modigliani and Miller [2] over the long-term. Carpentier [8] tested 243 French firms over the period 1987–1996 to study the effects of long-term changes in capital structure on firms' value. He found

that, in the long-term, changes to capital structure had no significant effect on firms' value. He therefore concluded that, in the long-term, Modigliani and Miller's [2] Irrelevance Theory could not be discounted.

4. METHODOLOGY, METHODS AND DATA

This study tests the proposition that changes made to the capital structure of oil companies over the last ten years have had a direct impact on the value of those companies. Although it is assumed that the changes have had either a positive or adverse effect upon the value of the oil companies, the Irrelevance Proposition [2], which posits that changes to capital structure do not affect market value, cannot be discounted here.

The research approach is quantitative, and data was collected by means of documentary analysis. The main documents studied were company accounts and reports, stock exchange reports, business databases and various related web sites; these were all researched for related company information. The FAME [20] and MERGENT online [21] databases were used in the research; these are considered reliable and used by financial and academic institutions worldwide.

The researchers examined the annual reports and accounts of five major oil companies for the past ten years. Announcements of equity or debt issues were noted and gearing ratios were studied to see if there were any major changes, indicating changes in the capital structure of the companies. The share price of each company over the last ten years was also tracked to see if there was any relationship between capital structure and the company's market value. Where changes to capital structure were announced, a note was made of the share price on that particular day and the two days following to identify any increase or decrease in the firm's market value. Additionally, where there was a major change in the gearing ratio in a particular year, fluctuations in share price during that year were monitored to see if there was any positive or negative change in the company's market value.

The research subjects are the five largest oil companies in the world. The oil industry was chosen because of the dearth of current research into the capital structure of oil companies; these five companies were chosen because they are all quoted on major stock exchanges worldwide, and together they account for the majority of the mergers and takeovers occurring in the industry between 1998 and 2007. As a result of these mergers and acquisitions, they are likely to have seen significant changes to their capital structure, which it may be possible to link to movements in share price and market value. Additionally, the companies chosen appear to have avoided the major stock market fluctuations caused by world events between 1997 and 2001. This should reduce the scope for discrepancies within the results. Finally, the information required for the research is publically available from all the participating companies. It was hoped that this information would allow us to identify any links between capital structures, share price and, ultimately, a firm's market value.

The five oil companies chosen for the investigation are: Chevron [22], BP [23], Shell [24], ExxonMobil [25] and Total [26]. Over the past ten years, all five companies have been party to major mergers or acquisition deals which would inevitably lead to changes in capital structure. BP, for example, merged with another large oil company, Amoco, in 1998; the new company, BP Amoco, started trading on 1st January 1999. All five companies are listed on the New York Stock Exchange and produce accounts in US Dollars; consequently, monetary figures are in US Dollars.

The stock market data originates from the Yahoo Finance website [27], a reliable data source that allowed us to research daily share prices over the past ten years. The sample started with the oil industry as a whole and then this sample was narrowed down to the five companies mentioned above.

Debt values are measured at book value, and the capital structure is represented by the net debt ratio. The net debt ratio was calculated by adding short-term finance debt to long-term finance, then subtracting cash and cash equivalents; this amount was then divided by the capital employed. The net debt ratio was taken from the individual company accounts. The market value of each company at a given point in time was calculated by multiplying the share price by the issued number of shares at that point in time.

The variation in the net debt ratio (ΔG) for each company was calculated on a yearly basis, using the

growth rate of the net debt ratio between the start of the year (G_s) and the end of the year (G_e):

$$\Delta G = \frac{(G_e - G_s)}{G_e} \quad (1)$$

Changes in a firm's market value (ΔMV) were calculated in the same manner:

$$\Delta MV = \frac{(MVe - MVs)}{MVe} \quad (2)$$

The mean for the period is 19.34 per cent which shows that oil companies are not highly geared. However, the mean net debt ratio for the period masks the significant changes in gearing levels at the individual company level. The trend for the period was for the net debt ratio to decrease and therefore we should expect to find that on the whole the value of each company would have decreased. The significant drop in the mean net debt ratio over the ten year period is mainly due to one company's net debt ratio decreasing into negative figures. This is because the company in question had high levels of cash and cash equivalents which, when deducted for the purpose of our calculations, resulted in a significant reduction in the debt level.

Table 1. Mean and the median net debt ratios for the chosen companies over the period 1998-2007.

Year	Number of companies	Mean net debt ratio	Median net debt ratio
1998	3	30.97%	30.70%
1999	5	30.52%	25.40%
2000	5	21.32%	22.60%
2001	5	20.40%	23.00%
2002	5	22.58%	23.50%
2003	5	18.76%	22.40%
2004	5	15.02%	19.90%
2005	5	11.46%	16.70%
2006	5	12.18%	14.80%
2007	5	10.24%	16.60%
Mean		19.34%	

Note: In the table only three companies appear in 1998, as no financial information was available for the other two companies for this year. However, in the nine years after 1998 all five companies appear in the calculations.

Table 2. Net debt ratios for the period 1998-2007.

Year	Chevron	BP	Shell	ExxonMobil	Total
1998	30.70%	25.50%	N/A	N/A	36.70%
1999	39.20%	25.40%	17.90%	20.40%	49.70%
2000	32.30%	22.60%	10.90%	7.90%	32.90%
2001	33.90%	23.00%	8.90%	5.30%	30.90%
2002	34.00%	22.40%	23.50%	4.40%	28.60%
2003	25.80%	22.40%	20.90%	-1.20%	25.90%
2004	19.90%	21.70%	17.50%	-10.70%	26.70%
2005	17.00%	16.70%	13.60%	-22.00%	32.00%
2006	12.50%	20.00%	14.80%	-20.40%	34.00%
2007	8.60%	23.00%	16.60%	-24.00%	27.00%

Source: Individual companies' accounts

Table 3. Correlation coefficient of changes in the net debt ratio and the market value on the long-term scale.

Company name	Mean ΔG	Mean ΔMV	Correlation coefficient
Chevron	-0.0206	0.1055	-0.3022
BP	-0.0025	0.0474	0.1833
Shell	-0.0014	0.0793	-0.3022
ExxonMobil	-0.0493	-0.0692	-0.2325
Total	-0.0097	0.1831	0.6299

Note: The correlation coefficient was calculated using the following formula:

Table 2 shows the same trend as Table 1 insofar as the net debt ratios for all five companies reduced over the ten year period. Chevron and ExxonMobil significantly reduced their net debt ratios, showing a drop of 22.10 and 44.40 percentage points respectively. BP reduced its net debt ratio, but for most of the ten year period, it remained at between 22 and 25 per cent. Shell had slightly lower net debt ratios overall, but still reduced its net debt ratio by 1.3 percentage points. Total over the ten year period had a higher net debt ratio than the other companies. This is due to the fact that Total is a French company and, as Clayton *et al.* [28] found, French companies tend to work with higher proportions of debt. However, Total also reduced its net debt ratio over the ten year period by 9.7 percentage points.

If Jensen and Meckling's [4] Agency Theory holds, then the reduction in the net debt ratio should result in a reduction in the company's market value – less debt means greater scope for conflicts of interest to arise as managers find themselves with more free cash. Conversely, as Carpentier [8] suggested, capital structure changes may have little or no long-term effect on the company's market value. This can be linked to Modigliani and Miller's [2] Irrelevance Theory.

5. EMPIRICAL TESTING AND RESULTS

This section presents and analyses the findings of the research and links these findings to the literature and research already carried out in this area. Firstly, long-term changes in capital structure were tested against company market values over the ten year period. The same test was then conducted in regard to short-term

changes – for the purposes of this study, this covered a one year period. Thirdly, an announcement test was conducted, looking at share price increases and decreases in the two days following an announcement of a capital structure change.

Long-term Test of Capital Structure Changes Against Company Market Value

In order to show how long-term changes to capital structure can affect company value the mean change in the net debt ratio and the mean change in the companies' market value were calculated. This was performed for the ten year period as a whole. A correlation coefficient was then calculated in order to demonstrate any correlation between changes in the net debt ratio and market value changes. Table 3 shows the results.

$$\text{Correl}(X, Y) = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum(x - \bar{x})^2 \sum(y - \bar{y})^2}} \quad (3)$$

where x is the change in net debt ratio and y is the change in market value of the company.

Table 3 shows that in the long-term, for Chevron, Shell and ExxonMobil there is a weak negative correlation between net debt ratio changes and changes in the market value of the company (results fall between 0 and -0.5). With a result between 0 and 0.5, BP demonstrates a weak positive correlation, while for Total there is a strong positive correlation (the result falls between 0.5 and 1).

The weak negative correlation in three of the companies' means that as their net debt ratio decreased, their market value increased over the ten year period.

This result can be linked to the research of De Angelo and Masulis [19], who found that an increase/decrease in gearing will decrease/increase the market value of a company which has large amounts of cash and non-cash equivalents (such as an oil company). However, as the negative correlation values are above -0.5 and nearer to 0, this suggests that there is very little correlation in the long-term, and that increases and decreases in the net debt ratio and ultimately capital structure have no effect on company value. This supports Modigliani and Miller [2], who suggested that capital structure is independent of company's value, hence their Irrelevance Theory. Carpentier's [8] results can also be linked to our findings, as his results showed strong evidence in support of the Irrelevance Theory.

BP and Total, on the other hand, have correlation coefficients of 0.1833 and 0.6299 respectively. This shows that there was a weak positive correlation between changes in the net debt ratio and changes in value for BP and a strong positive correlation for Total. The results for BP and Total show that when the net debt ratio increases, so does the market value. In the case of Total this increase in market value is significant because the correlation coefficient is above 0.5. Total's and BP's positive correlation coefficients can be seen to support Jensen and Meckling's [4] Agency Theory and Myers's [5] Pecking Order Theory, both of which suggest that adding more debt finance to the capital structure can increase the market value of a company. However, as with Chevron, Shell and ExxonMobil, BP's correlation coefficient is very weak, being nearer to 0 than to 0.5, suggesting that there is no significant correlation between changes in the net debt ratio and changes in market value in the long-term.

To sum up, the results of the long-term test indicate that, in the majority of cases, changes in the net debt ratio have no significant correlation with changes in the company's market value. These results, like those of Carpentier [8], suggest that Modigliani and Miller's [2] Irrelevance Theory seems to hold true in the long-term, in that the capital structure of a company is independent of that company's market value. On the other hand, the strong positive correlation indicated by Total's correlation coefficient suggests that the theories advocating that capital structure changes do affect a company's value can still not be discounted.

Short-term Test of Capital Structure Changes against Company Market Value

In order to show how short-term changes in the net debt ratio affect company market value, the same calculations were performed as for the long-term changes. Changes in the net debt ratio and market value of each company were calculated. These calculations were performed for one year: 2006.

Table 4 shows the results for these short-term changes. It shows that BP, Shell, ExxonMobil and Total all increased their net debt ratios throughout 2006, and that this coincided with increases in the market values of all four companies. These increases ranged from 1.5 percentage points for Shell to 54.5 percentage points for

Total. Conversely, Chevron reduced its net debt ratio over the same period. According to Agency Theory [4], we would expect the market value of Chevron to have decreased. However, as Table 4 shows, the market value of Chevron went up. This increase in market value and decrease in the net debt ratio was probably down to the fact that Chevron used a share issue to finance the acquisition of another company during the 2005/2006 financial year. The market reacted positively to this acquisition and this resulted in the market value of Chevron being increased. This contradicts Ross's [3] Signalling Theory, suggesting that other factors must have affected the share price that year.

The results of the short-term test show that a change in capital structure over the short-term affects the market value of a company. In four out of the five companies, an increase in the net debt ratio during 2006 resulted in an increase in the market value of the company. These results support the findings of Harris and Raviv [29] who found that, in the short-term, gearing increasing (decreasing) transactions leads to a positive (negative) reaction from stock markets, with a resulting positive (negative) effect on company market value. Although the results on the whole indicate a positive correlation between changes in capital structure and changes in market value in the short-term, the Chevron result suggests that this conclusion should only be tentative.

Announcements of Changes to Capital Structure and their Effect on Market Value

After studying the changes made to net debt ratio over the course of one year, it was decided to study the announcements of changes in capital structure. The aim was to see whether, in the two working days following an announcement of a change in capital structure, there was a positive correlation between the announcement and changes in market value.

In 2001, Chevron merged with another company, Texaco, in a transaction which would ultimately increase the net debt ratio of Chevron. The merger was announced on 9th October 2001 and in the two working days following the announcement of the gearing increasing transaction, of a 5 per cent increase in the net debt ratio, resulted in a 4 percentage points increase in the share price and consequently the market value of Chevron increased.

In 1999, total takeover another company, Petrofina. This takeover would increase the net debt ratio of Total by 26 percentage points. The takeover was announced to the market on 26th March 1999 and in the two working days following the announcement, Total's share price increased by 4 per cent. As with Chevron, there seems to have been a positive relationship between the gearing increasing announcement, the change in share price and, ultimately, the change in the market value of Total.

In 2007 BP acquired one of Chevron's Dutch manufacturing companies. The acquisition was financed with a combination of shares and debt and ultimately increased the net debt ratio of BP by 13 percentage points. The acquisition was announced to the market on

31st March 2007, but, unlike Chevron and Total, in the two working days following the announcement BP's share price decreased by 0.06 per cent. This was not a significant decrease, however, suggesting that the announcement had very little effect on the market value of BP.

Table 4. Short-term changes in the net debt ratio and market value (Year 2006).

Company name	ΔG	ΔMV
Chevron	-0.360	0.275
BP	0.165	0.060
Shell	0.081	0.015
ExxonMobil	0.078	0.212
Total	0.059	0.545

Table 5. Changes in share price following announcements of capital structure-changing transactions.

Company	Year	Dates	ΔG	ΔSP
Chevron	2001	09/10/01 - 11/10/01	0.0472	0.0378
BP	2007	30/03/07 - 03/04/07	0.1304	-0.0006
Total	1999	26/03/99 - 30/03/99	0.2616	0.0403

The results of the announcement test show there is a positive relationship between announcements of net debt ratio-increasing/decreasing transactions and share price and market value in the short period following an announcement. The results for Chevron and Total show a positive correlation between the change in net debt ratio arising from a transaction and changes in the share price and ultimately the market value of both companies. Chevron and Total's results appear to support Ross's [3] Signalling Theory, which suggests that gearing increasing announcements signal higher future cash flows to the market, leading to climbing share prices and increased market value. The results also support the findings of Harris and Raviv [29]. On the other hand, the BP result indicates that the Irrelevance Theory proposed by Modigliani and Miller [2] cannot be discounted in the extreme short-term (although the minimal nature of the change in share price may have been due to the fact that BP used shares as well as debt to finance the acquisition). In terms of Signalling Theory [3], it could be argued that the positive market reaction to the use of debt to finance the acquisition could have been offset by a negative market reaction to the share issue, and consequently there was no significant movement in value.

6. CONCLUSION

From the results of the long-term, short-term and daily tests of the relationship between capital structure changes and company market value, we can conclude that in the long-term, changes to the capital structure of a company are independent of changes to its market value. However in the short-term and daily tests, the results on the whole show a positive relationship, in that changes to capital structures are usually followed by a change in the market value.

The long-term tests showed no significant positive or negative correlation between changes to capital structure and changes to market value: the correlation coefficients for Chevron, BP, Shell and ExxonMobil

were nearer to zero than one or minus one. This lack of correlation between changes in capital structure and changes in market value supports the Irrelevance Theory [2] and Carpentier's [8] results. However, Total's result in the long-term shows a strong positive correlation between changes in capital structure and changes in market value. This means that models such as Signalling Theory [3], Agency Theory [4] and Modigliani and Miller's [12] Tax Model – which advocate adding more debt finance to a company's capital structure to increase market value – cannot be rejected.

Results from the short-term test, examining changes in capital structure during 2006, demonstrate a correlation between changes in capital structure and changes in market value. Four out of the five companies increased their net debt ratios and this coincided with an increase in the market value of those companies. The short-term changes in capital structure and their positive link to market value can be related to various theoretical models and research papers, such as that of Harris and Raviv [29], whose results demonstrated a positive correlation between short-term changes in capital structure and changes in market value. Both the present results and the findings of Harris and Raviv [29] support the theoretical model advanced by Ross [3], who suggested that changes in capital structure are signals to the market of future cash flows. An increase in the net debt ratio conveys to the market a signal of higher future cash flows. This leads to a rise in market value, as was the case with four out of the five oil companies. On the other hand, one result from the short-term test still casts doubt over the results. Despite reducing its net debt ratio, Chevron's market value increased. This is a direct contradiction of Ross's Signalling Theory [3] and Harris and Raviv's [29] results.

The announcement test results show a direct relationship between capital structure changes and changes to market value. The results of this test clearly illustrate Signalling Theory [3]; announcements of gearing increasing transactions on the whole resulted in an increase in the share price and therefore an increase

in market value. The announcement test results demonstrate, as with the short-term test, direct links to such theories as Agency Theory [4] and Pecking Order Theory [5], which both advocate that increasing debt levels increases company value. However, as with the long-term and short-term tests, the announcement test produced one result which was not in line with the other results. We must therefore continue to bear in mind Modigliani and Miller's [2] Irrelevance Theory.

On the whole, the short-term test and the announcement test demonstrate a direct positive relationship between changes in capital structure and changes in market value. Specifically, an increase in the net debt ratio resulted in an increase in market value. However, over the long-term the results show no significant correlation between changes in capital structure and changes in market value. One plausible explanation for the long-term result is that companies face other factors which may overshadow the relationship between capital structure changes and market value. Evidently, the relationship between capital structure and market value in both the short-term and long-term requires more extensive analysis and research.

This area of research is still inconclusive, in that there is no definitive answer to whether or not capital structure changes are related to company value. It would be instructive to interview finance directors to ascertain whether companies have target debt ratios, and whether or not the directors themselves believe a company's capital structure affects its value. Future research could also examine a larger sample of companies and cover a longer time period to generate more comprehensive data and produce a more definitive answer.

REFERENCES

- [1] Arnold, G., 2005. *Corporate Financial Management*. Third edition. Harlow: Pearson Education Limited.
- [2] Modigliani, F. and Miller, M.H., 1958. The cost of capital, corporation finance and the theory of investment. *American Economic Review* 48(3): 261-297.
- [3] Ross, S., 1977. The determination of financial structure: the incentive-signalling approach. *The Bell Journal of Economics* 8(1): 23-40.
- [4] Jensen, M.C. and W. Meckling, 1976. Theory of the firm: management behaviour agency costs and capital structure. *Journal of Financial Economics* 3(4): 305-360.
- [5] Myers, S., 1984. The capital structure puzzle. *Journal of Finance* 39(3): 575-592.
- [6] Masulis, R.W., 1983. The Impact of capital structure change on firm value: some estimates. *Journal of Finance* 38(1): 107-126.
- [7] Litzenberger, R.H., 1986. Some observations on capital structure and the impact of recent recapitalizations on share prices. *Journal of Financial & Quantitative Analysis* 21(1): 59-71.
- [8] Carpentier, C., 2006. The valuation effects of long-term changes in capital structure. *International Journal of Managerial Finance* 2(1): 4-18.
- [9] Soule, R.P., 1953. Trends in the cost of capital. *Harvard Business Review* 31(2): 33-47.
- [10] Durand, D., 1959. The cost of capital, corporation finance, and the theory of investment: comment. *American Economic Review* 49(4): 639-655.
- [11] Rose, J.R. 1959. The cost of capital, corporation finance, and the theory of investment: comment. *American Economic Review* 49(4): 638-639.
- [12] Modigliani, F. and M.H. Miller, 1963. Corporate income taxes and the cost of capital. *American Economic Review* 53(3): 433-443.
- [13] Fama, E. and M. Miller, 1972. *The Theory of Finance*. New York: Holt, Rinehart, and Winston.
- [14] Harris, M. and A. Raviv, 1990. Capital structure and the informational role of debt. *Journal of Finance* 45(2): 321-349.
- [15] Stulz, R.M., 1990. Managerial discretion and optimal financing policies. *Journal of Financial Economics* 26(1): 3-27.
- [16] Jensen, M.C., 1986. Agency cost of free cash flow, corporate finance and takeovers. *American Economic Review* 76(2): 323-339.
- [17] Leland, H. and D. Pyle, 1977. Information asymmetries, financial structure, and financial intermediation. *Journal of Finance* 32(2): 371-388.
- [18] Myers, S. and N. Majluf, 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* 13(2): 187-221.
- [19] De Angelo, H. and R.W. Masulis, 1980. Leverage and dividend irrelevancy under corporate and personal taxation. *Journal of Finance* 35(2): 453-464.
- [20] FAME. 2009. A Database for UK and Irish Company Information and Business Intelligence. [online], Retrieved October 2009 from <https://fame2.bvdep.com/version-20101126/Home.serv?product=fameneo>.
- [21] MERGENT.2009. [Online Database]. Retrieved October 2009 from <http://www.mergent.com/productsServices-desktopApplications-online.html>.
- [22] Chevron. 1997-2007. Annual Reports. [Online], Retrieved September 2009 from <http://www.chevron.com/search/?k=annual%20reports&text=annual%20reports&Header=FromHeader&ct=All%20Types%20%3chttps://shibidp.n.tu.ac.uk/exchweb/bin/redir.asp?URL=http://www.chevron.com/search/?k=annual%2520reports%26text=annual%2520reports%26Header=FromHeader%26ct=All%2520Types>.
- [23] BP. 1997-2007. Annual Reports. [Online], Retrieved September 2009 from <http://www.bp.com/extendedsectiongenericarticle.do?categoryId=9021605&contentId=7040949>.
- [24] Shell. 1997-2007. Annual Reports. [Online], Retrieved September 2009 from http://www.search.shell.com/search?_utma=

