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Comparative critique of the performance evaluation methods in the Australian energy industry

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Keywords

evaluation, performance, critique, comparative, australian, methods, energy, industry

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Comparative Critique of the Performance Evaluation Methods in the Australian Energy Industry

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Abstract

The purpose of this study is to investigate the efficiency of business evaluation methods in the Australian energy industry during the periods from 1989 to 2007. The six commonly used business evaluation methods (CAPM, WACC, EVA, P/E ratio, DCF and MetaCapitalism) were selected and compared with the share price in the whole market, listed market and delisted market, to explore which valuation methods were better for evaluating business performance in the Australian energy sector over the long-term. An empirical analysis using linear regression, we find evidence that CAPM is a much better method for listed companies to measure the rate of return of an asset in a well-diversified portfolio in the Australian energy industry, while DCF was a better method for listed and delisted companies, when making capital budgeting decisions for public companies in the Australian energy sector. We also find that the generic efficiency prescriptions of the radical corporate strategy: MetaCapitalism, was based on fallible assumptions, and tended to transfer negative signals to the market as reflected in the share price, as well as threatening the long-term sustainability of business and social stability.

INTRODUCTION

In a rapidly developing economy today, the world economy and culture are becoming increasingly interconnected (Lippitt, Mastracchio & Lewis, 2008). However, the business valuation process has been changing at a pace that is even more accelerated than the pace of change in the world's economy (Hitchner, 2006). Therefore, there is an ever-increasing demand for business valuation services pertaining to ownership interests and assets in non-public companies and subsidiaries, divisions, or segments of public companies (Hitchner, 2006). Business valuation is a process and a set of procedures used to estimate the economic value of an owner's interest in a business (Soshnick, 2008). Valuation is used by financial market participants to determine the price they are willing to pay or receive to consummate a sale of a business (Soshnick, 2008).

Different valuation approaches and methods result in different levels of valuation. The valuation models commonly described in theory are income approach, market approach and asset-based approach (Hitchner, 2006). All models have problems, and nothing is perfect (Benninga, 2000). There is no right way to estimate the value since there are many factors that influence it. The best standard of value is the fair market value. Fair market value is a concept of value in exchange. It is defined as "the price at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or sell and both having reasonable knowledge of the relevant facts"(Michael 2002, p. 123).

Academic literature has long been interested in business valuation methods in Australia. Koller, Goedhart & Wessels (2005) explore the CAPM, WACC, DCF, EVA and PE ratio's fundamental principles and methodology applied in Australian industry. Hitihner (2006) presents a consensus view of thirty of the leading valuation analysts and extensively examines the market approach to valuate business in Australian energy sector. Pratt's (1998) examines that the cost of capital is a critical component in both the valuation and the corporate decision-making process and explores the CAPM and DCF methodology, assumption and limitations as well as how the CAPM and DCF were adopted to evaluate business performance in Australian electricity industry.

No evidence is available at present on which valuation methods are better for evaluating business performance in the Australian energy sector. Therefore, we attempt to compare the different business evaluation methods in the Australian energy sector, in order to fill the part of this gap. The results, based on empirical analysis among the business valuation methods, are mixed. CAPM is a much better method for listed companies to measure the rate of return of an asset in a well-diversified portfolio in the Australian energy industry, and DCF is a better method for the whole of listed and delisted companies, to make capital budgeting decisions for public companies in the Australian energy sector. In addition, the results show that Metacapitalism is a radical corporate strategy based on faulty and

tends to transfer negative signals to the market as reflected in share price, and threatens the long-term sustainability of business and social stability.

This study contributes to several literatures, including the growing literature on business valuation methods. First, this research is one of the first to present the systematic descriptions about comparing the different business valuation methods in Australia, especially in the energy sector. Second, this research is very good example for quantitative methodology practice in Australian industry because it expands the practical application of financial to real business problems and reflects economic events of the past decade along with new developments in academia within the finance industry. Third, this study not only assists regulators in setting standards, but also enhances more knowledge of business valuation methods for the benefit of customers and investors.

In the next section, we explore the literature review and variable selection. Then we describe the sample selection and data. The results are presented in the "results and discussion" section. Last section concludes.

LITERATURE REVIEW AND VARIABLE SELECTION

CAPM (Capital Asset Pricing Model)

The Capital Asset Pricing Model (CAPM) is used in finance to determine a theoretically appropriate required rate of return of an asset, providing that the asset is to be added to an already well-diversified portfolio and given that assets are a non-diversifiable risk. According to Cochrane (2001), the CAPM formula takes into account the asset's sensitivity to non-diversifiable risk, often represented by the quantity beta (β) in the financial industry, as well as the expected return of the market and the expected return of a theoretical risk-free asset.

According to Ross et al (2004), the reward-to-risk ratio for Asset i is the ratio of its risk premium, $E(R_m) - R_f$, to its beta, β_{im}: $[E(R_m) - R_f]/\beta_{im}$. In a well-functioning market, this ratio is the same for every asset. As a result, when expected returns are plotted against asset betas, all assets plot on the same straight line, called the security market line (SML). From the SML, the expected return on Asset i can be written: $E(R_i) = R_f + \beta_{im}[E(R_m) - R_f]$.

The model that describes the relationship between risk and expected return and that is used in the pricing of risky securities (Cochrane, 2001).

$$\mathbf{E(R_i) = R_f + \beta_{im}(E(R_m) - R_f)}$$

Where:

$E(R_i)$ is the expected return on the capital asset; and

R_f is the risk-free rate of interest in the economy (for example, the yield on Treasury bills or bonds).

β_{im} (the beta coefficient) the sensitivity of the asset returns to market returns, or also

$$\beta_{im} = \frac{Cov(Ri, Rm)}{Var(Rm)}$$

$E(R_m)$ is the expected return of the market; and

$E(R_m) - R_f$ is sometimes known as the *market premium* or *risk premium* (the difference between the expected market rate of return and the risk-free rate of return).

WACC (Weighted Average Cost of Capital)

Research by Hitchner (2006), the weighted average cost of capital (WACC) is the average of the cost of equity and debt, weighted by the proportions of equity and debt which an efficiently financed company can be expected to use to fund its activities. Hence to determine the WACC, it is necessary to determine the cost of debt and the cost of equity and the proportions of debt and equity that would be employed by an efficiently financed company.

The traditional formula used to develop a WACC is (Hitchner, 2006, p.190):

$WACC = (K_e * W_e) + (K_p * W_p) + (K_{d/(pt)}[1-t] * W_D)$

Where:

WACC= Weighted average cost of capital;

K_e = Cost of common equity capital;
W_e = Percentage of common equity in the capital structure, at market value;
K_p = Cost of preferred equity;
W_p = Percentage of preferred equity in the capital structure, at market value;
$K_{d/(pt)}$ = Cost of debt (pre tax);
T = Tax Rate; and
W_d = Percentage of debt in the capital structure, at market value.

DCF (Discounted Cash Flow)
Evidence from Tanzi (2006), DCF is one of the most important concepts underlying financial decision making**.** Also known as the "time value of money", DCF applies to any situation in which money is paid at one point and received at a different point. Its methodology expresses the present value of a business as a function of its future cash earnings capacity. This evidence has carefully shown that DCF methodology works on the premise that the value of a business is measured in terms of future cash flow streams, discounted to the present time at an appropriate discount rate. If the value arrived at through DCF analysis is higher than the current cost of the investment, the opportunity may be a good one.

This study will focus on the free cash flow to equity approach to determine the "fair value" of companies. The enterprise value of the firm is defined to be the value of the firm's debt, convertible securities and equity. "In financial theory, the enterprise value is the present value of the firm's future anticipated cash flows. Accordingly, the enterprise value of the firm is the discounted value of the firm's projected FCF plus its terminal value" (Benninga 2000, p. 68).

Enterprise value= $FCF_1/ (1+WACC)^{1}+FCF_2/ (1+WACC)^{2}+$……...

$FCF^5/ (1+WACC)^{5}$+Year 5 terminal value/ (1+WACC)

There are several ways to estimate a terminal value of cash flows, but one well-known method is to value the company as a perpetuity using the Gordon Growth Model. The model uses this formula (Benninga 2000, p. 70):

$$\text{Terminal Value} = \frac{\text{Final Projected Year Cash Flow X (1+Long-Term Cash Flow Growth Rate)}}{\text{(WACC – Long-Term Cash Flow Growth Rate)}}$$

Fair Value of Company Equity = Enterprise Value – Debt

Share Price = Fair Value of Company Equity / Shares Outstanding

P/E Ratio
According to Hitchner (2006), the P/E ratio (price to earnings ratio) of a stock is a measure of the price paid for a share related to the annual income or profit earned by the firm per share. When it comes to valuing stocks, the price/earnings ratio is one of the oldest and most frequently used metrics. It can be seen that a high P/E suggests that investors are expecting higher earnings growth in the future compared to companies with a lower P/E. However, the P/E ratio doesn't tell us the whole story by itself. It's usually more useful to compare the P/E ratios of one company to other companies in the same industry, to the market in general or against the company's own historical P/E.

P/E is short for the ratio of a company's share price to its per-share-earnings. Basically, the P/E ratio formula is set as the following (Hitchner, 2006):

$$\text{P/E ratio} = \frac{\text{Price per Share}}{\text{Annual Earning per Share}}$$

- The price per share is the market price of a single share of the stock; and

- The earnings per share are the net income of the company for the most recent 12 month period, divided by number of shares outstanding. The earnings per share (EPS) used can also be the "diluted EPS", or the "comprehensive EPS".

Its formula is: EPS=Net Income / Average Outstanding Shares

EVA (Economic Value Added)

According to Banerjee (2000), Economic Value Added (EVA) may be defined as the net operating profits after tax minus an appropriate charge for the opportunity cost of all capital invested in an enterprise. Thus

EVA= Net Operating Profit after tax – Weighted Average Cost of Capital
EVA can be rewritten as:
EVA = (ROI – WACC)*CAPITAL EMPLOYED

$ROI=\frac{NOPAT}{K}$, called the return on invested capital; and

Capital Employed: represents the total cash investment that shareholders and debt holders have made in a company.

"EVA captures the fact that equity should earn at least the return that is commensurate to the risk that the investor takes" (Mark1996, p.45). This evidence has shown that equity capital has to earn at least same return as similarly risky investments at equity markets. If that is not the case, then there is no real profit made and actually the company operates at a loss from the viewpoint of shareholders. On the other hand, if EVA is zero, this should be treated as a sufficient achievement because the shareholders have earned a return that compensates the risk.

MetaCapitalism

The MetaCapitalism equation is used as a means of reducing the strategy to a measurable index. The core tenets of MetaCapitalism are decapitalisation, outsourcing and downsizing and these can be measured by PP&E, NWC and NOE (Means & Schneider, 2000). Measure a firm's level of MetaCapitalisation by calculating its composite change value over time, based on:

$$\frac{NMC + PP\&E + NOE + R\&D}{TA}$$

This equation, and in particular the corresponding ratios, were taken to indicate the level of MetaCapitalisation because they precisely represent the main tenets of the strategy of decapitalisation (ie: Net Working Capital or NWC), selling of physical assets (Plant Property and Equipment or PPE), and reduction in the number of employees through downsizing and outsourcing (Number of Employees or NOE).

The highest negative change in each index represents an aggressive application of the strategy through to the highest positive change, which represents passive application or no application at all. It was then possible to categories the firms into groups, in the order of the largest negative change in value of their MetaCapitalisation downwards (Mickhail and Ostrovsky, 2007).

Asset declines because of the de-capitalization of all non-core capital assets (Lower PP&E, better use of Net Working Capital or NWC). Also, liability decrease (lower Long Term Debt); and reduction in the number of employees through downsizing and outsourcing lead to reduce of expenses (lower NoE, lower Transaction and Procurement Cost). Therefore, the profit increases. Due to a lack of available information, the analysis on the NOE has been excluded and leaves six remaining indices to be tested; they are NWC Change, PP & E Change, TA Change, NWC/TA Change, PP & E /TA Change and NWC +PP&E/TA Change.

The formula is comprised of six parts which compare the change in the share price. The formula indicates which indices are responsible for adverse effects. The period signifies which MetaCapitalism indices change correlates to the share price change.

SAMPLE SELECTION AND DATA

Data and methods

The sample period spans 19 years from 1989 to 2007. There are 177 existing listed companies and 35 delisted companies in the sample with different number of participating years of them. All of the firms belong to the Australian energy industry. The six commonly used business valuation methods (CAPM, WACC, EVA, P/E ratio, DCF and MetaCapitalism) are selected and compared with the share price in the whole market, listed market and delisted market to evaluate business performance. The percentage change of the energy company's index and the share price were calculated from one year to the next year and then cumulative methods have been used to calculate each year's percentage of change rate for the share price and the business valuation methods. Share price and energy company's data are collected from online sources FinAnalysis[1] that listed a 19-year history of detailed financial information for all companies listed on ASX on a yearly basis from 1989 to 2007.

In this study, the main purpose is to establish the strength of the link between the business evaluation methods and the share prices, so the simple regression analysis is used to analyse their relationship. The business evaluation methods are the predicted value, so it is termed the dependent variable. The share prices are actual value and it is termed the independent variable.

RESULTS AND DISCUSSION

This chapter will critique six business valuation methods' efficiency for the Australian energy sector. The linear regression is used to compare business valuation methods and the share price, in order to obtain which method is better for evaluation business performance in Australian energy sector. The following lists the empirical results for the business valuation methods and the share price.

Insert Table 1 about here

CAPM

1. Based on the market value

CAPM is used to determine a theoretically appropriate required rate of return of an asset, CAPM is expressed as: $E(R_i) = R_f + \beta_{im}(E(R_m)-R_f)$. Here, R_f is the risk-free rate of interest in the economy, the Australian Government 10 yrs bonds rate end of year close from 1989 to 2007 is conducted for the risk free rate of return. $E(R_m)$ is the expected return of the market, the Australian All Ordinaries Index end of year close from 1989 to 2007 has represented for the expected market rate of return $E(R_m) - R_f$ is sometimes known as the market premium or risk premium, it is the return in excess of the risk-free rate of return that an investment is expected to yield. An asset's risk premium is a form of compensation for investors who tolerate the extra risk, compared to that of a risk-free asset in a given investment. The evidence shows that the CAPM model based on the market value rather than the book value, it can exactly measure the rate of return of an asset for the firms in the market. Therefore, CAPM is the higher associated with the share price in the listed market.

2. Low beta and negative beta affect on CAPM

From the calculated results, there is only one year negative beta -0.2587 (1997) in the listed companies and its average beta is 0.99 (excluded unusual 7.1158 in 1999). But, delisted companies have 11 years' negative beta, -0.2991 (1992), -0.2086 (1994), -0.0050 (1995), -0.1678 (1996), -1.7642 (1997), -0.2503 (1998), -2.7375 (2001), -2.7545(2002), -1.1014(2003), -3.5075(2007) and its average beta is -0.77 (excluded unusual 6.5978 in 1999).

Insert Table 2 about here

It is clear that there is low beta (0.99) in the listed companies from 1989 to 2007. According to evidence by Richard (1995) has shown that in the period from 1931 through 1965 low beta stocks in the United States did better than the capital asset pricing model (CAPM) predicts while high beta stocks did worse and this pattern continued in subsequent years, at least through 1989. This evidence has shown that low beta is preferable to high beta in predicting a firm's performance using CAPM model, because the low beta predicts the expected return rate better than the high beta predicts. Therefore, CAPM is more closely associated with the share price in the listed companies.

It can be seen that there is an average negative beta (- 0.77) in the delisted companies from 1989 to 2007. Research by Larcker, Gordon & Pinches (1980), the well-documented negative correlation between index returns and

[1] http://www.aspecthuntley.com.au/af/finhome

volatility generates a strongly negative beta, but this negative beta can only explain a small portion of the negative variance risk premium. On the other hand, evidence by Santaularia (2006) details that a negative beta estimate implies that investors require a return from the companies, less than the yield on risk-free government bonds, which is clearly economically implausible. The evidence proves that the negative beta produces the inefficient role on the market, which resulted in CAPM have a poor correlation with the share price in the delisted market.

Therefore, CAPM model is more highly associated with share price in listed market and weak correlation with share price in delisted market. This is because the beta is the only relevant measure of a stock's risk. The low beta and negative beta have an essential role in the CAPM.

3. Share price change rate affects Beta

The following is the share price change rate from 1989 to 2007, it is likely that delisted companies have experienced dramatically change rate during this periods, from -37.55% (1997-1998) to 235.4% (1991-1992). However, there are slight fluctuations in change rate in the listed companies, between -24.41% (1997-1998) and 58.86% (1992-1993). The beta is the average of 0.99 in the listed market and -0.77 in the delisted market. This evidence has carefully shown that the beta is more accurately affects the market risk under the moderate market condition; otherwise the beta is not able to measure the companies' undertaking risk and making CAPM misleading under stronger fluctuated market.

Insert Table 3 about here

Therefore, CAPM model is more highly associated with share price in listed market and weak correlation with share price in delisted market. This is because the beta is the only relevant measure of a stock's risk. The low beta and negative beta have an essential role in the CAPM.

WACC

WACC is more closely associated with the share price in the listed market. This is because when people are measuring expected cost of new capital, they should use the market values of the components, rather than their book values (Truong, Partington & Peat, 2008). From its traditional formula: WACC= $(K_e * W_e) + (K_p * W_p) + (K_d / (pt)[1-t] * W_D)$, it can be seen that the cost of equity and cost of debt (pre – tax) mainly consist of WACC and both of them should be calculated by the market value. Market value is the price at which an asset would trade in a competitive market and it reflects the market real options (Galbraith & Stiles, 2008). The book value is value at which an asset is carried on a balance sheet and it focus on the accounting measures. Therefore, using the market value makes WACC model significant correlation with stock returns in listed market.

However, WACC model has a poor relationship with share price in a delisted market. This is because estimated beta affects estimating WACC. According to evidence by the Equity Beta of an Energy Distribution Business (2005), the estimated betas will vary dramatically over time resulting in substantial swings in WACC estimates. In a commercial setting, this would cause the firm's investment strategy to be driven by statistical aberrations in small data sets rather than economic fundamentals. "The estimates could be dramatically different if a different data period, frequency, or statistical method had been adopted" (The Equity Beta of an Energy Distribution Business, 2005, p.65). These evidences have shown that the uncertainty surrounding beta estimates and the effect this has on estimates of WACC. There is the negative beta in the delisted market in the Australian energy sector, which resulted in weak relationship between the stock returns and WACC in delisted market.

EVA

From the regression analysis, the EVA was the poor associated with the share price in the whole market, listed market and delisted market. EVA is considered as the centre-piece of a completely integrated financial framework for financial management and incentive compensation (Steward, 1994). And EVA is calculated as the business multiplied by the spread between the rate of return on capital, defined as r, and the cost of capital, defined as c* (Stewart, 1991).The evidence has shown that EVA is an accounting-based measure of operating performance. So its limitation is that it still based on accounting figures, irrespective of the GAAP- related adjustments (Worthington, 2001). EVA is an accounting-based measure of operating performance. It has complex and costly accounting adjustments problems. In addition, these are not consistent with standards for the EVA accounting adjustments, and the companies that used the EVA to evaluate the performance have not revealed the processes for the using the EVA.

DCF

At the present, DCF techniques have become the most popular techniques in making capital budgeting decisions for public companies in Australia, as well as in other countries (Kaplan & Ruback, 1995). In this paper, the free cash flow to equity approach has been used to analyse the energy companies' fair value. Through the long term analysis on this model, the t-stat is 2.7418, 2.3704 and 2.3991, respectively in whole market, listed market and delisted market. The evidence has shown that using DCF model is appropriate for the energy sector in the Australia.

It is clear that DCF analysis tries to work out the value of a company today, based on projections of how much money it will generate in the future. The basic idea is that the value of any company is the sum of the cash flows that it produces in the future, discounted to the present at an appropriate rate (Lehn & Poulsen, 1989). Moreover, the model is not suited to short-term investing, the DCF focuses on long-term value. A well-crafted DCF may help people avoid buying into a bubble, but it may also make you miss short-term share price run-ups that can be profitable (Lehn & Poulsen, 1989). According to the evidence by Morris (2008), DCF used the market values to measure expected cost of new capital, rather than their book values, and it is based on realistic rather than optimistic growth expectations. For the most part, free cash flow is a trustworthy measure that cuts through much of the arbitrariness of "guesstimates" involved in reported earnings (Farisssi, 2008).

On the other hand, DCF model produces the closest thing to an intrinsic stock value. The alternatives to DCF are relative valuation measures, which uses multiples to compare stocks within a sector (Morris, 2008). While relative valuation metrics such as price-earnings (P/E), EV/EBITDA and price-to-sales ratios are fairly simple to calculate, they are not very useful if an entire sector or market is over or undervalued. A carefully designed DCF, by contrast, should help investors steer clear of companies that look inexpensive against expensive peers (Morris, 2008). The DCF model used the market values to measure expected cost of new capital rather than their book values and DCF model produces the closest thing to an intrinsic stock value. Therefore, the DCF model is suitable measure for the energy sectors in the long term in Australia.

P/E Ratio

The empirical results on P/E Ratio have shown that there are a stronger relationship between share price and P/E ratio in whole market, listed market and delisted market. Here, we will discuss the phenomena why P/E ratio model has the stronger relationship with share price in the three markets. P/E ratio is frequently used as a tool to measure the market value. For example, companies expected to grow and have higher earnings in the future should have a higher P/E than companies in decline. In addition, P/E ratio is best viewed over time, looking for a trend. A company with a steadily increasing P/E is being viewed by the investment community as becoming more and more speculative.

However, from the P/E ratio formula we can find that the price per share is the market price of a single share of the stock. The earnings per share are the net income of the company for the most recent 12 month period, divided by number of shares outstanding. It is clear that the price per share is the current company share price and based on the market value. However, an important problem that the denominator (earnings) is based on an accounting measure of earnings that is susceptible to forms of manipulation, making the quality of the P/E only as good as the quality of the underlying earnings number (Johnson & Shirer, 2008). This evidence has carefully shown that people can get into a lot of troubles by valuing stocks using only simple indicators such as the P/E ratio, because the P/E ratio is based on the book value rather than the market value and the companies can easily manipulate the earning per share to make the quality of the P/E ratio. On the other hand, it is difficult to say whether a particular P/E is high or low without taking into account growth rates and the industry. Therefore**,** although the P/E ratio has some problems, such as the accounting measure of earnings and the inflation issues, it is also the most commonly used valuations metric by investors, because it is the indicator of the market value and easily to calculate.

Metacapitalism

Regression analysis is used to develop an equation (a linear regression line) for predicting a value of the dependent variables (NWC, PP&E, TA, NWC/TA, PP&E/TA and NWC+PP&E/TA) given a value of the independent variable (Share Price). The results have shown that the six dependent variables have the poor associated with the share price. The following is the critique for these results.

1. NWC+PP&E/TA Index

NWC+PP&E/TA are the other important index for the companies. This equation and in particular the corresponding ratios, were taken to indicate the level of MetaCapitalisation because they precisely represent the main tenets of the strategy-decapitalisation, selling of physical assets, and reduction in the number of employees through downsizing and outsourcing (Mickhail, Ostrovsky, 2005). According to the research study, the NWC+PP&E/TA change correlation rate in the delisted companies is -18%, which was negative correlation with the share price change. Due to MetaCapitalism strategies, when the share price is the negative correlation with the NWC+PP&E/TA change, which can make companies production more efficiency and bring more benefits for them. However, in this case, collapse, mergers, taken over, suspended and down in rank groups was included in the delisted company list. Therefore, these results contradict the claims of MetaCapitalim.

2. Extreme Changes

Empirical reflections got the results that all the companies that were selected from each group experienced the extreme changes in the total periods. For example, there was a dramatic increase by 17729.41% in the TA change of CXR in 1990-1991, then the change of TA significant decreased by 80.48% in 1991-1992 and continually dropped by -14.51% in 1993-1994. Finally, the company went to bankruptcy in 1998. The other example, the PP&E change of SPP was -28.26% in 1994-1995, -3517.97% in 1995-1996, and then the change have dramatically increased by 4.01% in 1998-1999. At the last, the company was closed in the year of 2000. Therefore, the most companies experienced the extreme changes during the periods and then the companies quickly suffered the severe damage.

3. Comparison with ASX 200 Energy Company

And the market clearly does consider PP&E to be important. PP&E was found to be the single most important index for the individual companies (Farrell, 2005). Empirical reflections have shown that most companies experienced the negative correlations with ASX 200 Energy Company. And these companies experienced negative correlations with the share price when PP&E reduced. It is clear that most PP&E change in the ASX 200 Energy Company was the positive correlation with the share price change. Therefore, this evidence has shown that the ASX 200 Energy Company PP&E change is the positive correlation with the share price change, which refutes MetaCapitalism assumptions that decrease in PP&E change will increase the share price change.

CONCLUSIONS

The purpose of this paper is to explore the efficiency of business evaluation methods in the Australian energy industry during the periods from 1989 to 2007. Six business evaluation methods (CAPM, WACC, EVA, P/E ratio, DCF and Metacapitalism) were selected and compared with the share price in the whole market, listed market and delisted market to determine which valuation methods are better for evaluating business performance in the Australian energy sector over the long term.

According to data analysis of the different business valuation methods over the long-term in the Australian energy sector, it can be seen that CAPM and WACC have a close association with the share price in the listed market, and DCF and P/E ratio have the higher correlation with the share price in the listed and delisted market. However, an important problem in the use of the P/E ratio is that the denominator (earnings) is based on an accounting measure of earnings that is susceptible to forms of manipulation, making the quality of the P/E ratio only as good as the quality of the underlying earnings number.

This supports our findings that CAPM was a better method for the listed companies to measure the rate of return of an asset in a well-diversified portfolio in the Australian energy industry and DCF is often a better method for the listed and delisted companies to make capital budgeting decisions for public companies in the Australian energy sector.

Business valuation plays a vital role in business success, especially in the modern technology society. The movement underway to improve corporate governance will encourage companies to focus on long term value creation (Hitchner, 2006). The evidence shows that managers and board members should set long-term shareholder value creation as their primary objective and create healthier companies, which in turn provide spillover benefits, such as stronger economies, higher living standard, and more employment opportunities.

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Table 1

Estimates of the Methods

Methods	Whole Market		Listed Market		Delisted Market	
	t-stat	correlation	t-stat	correlation	t-stat	correlation
CAPM	1.8204	0.4371	3.7266	0.7069	-0.6861	-0.1804
WCC	1.6372	0.4599	3.1482	0.7053	-0.7319	-0.2253
EVA	-0.0012	-0.0004	0.373	0.1235	0.0844	0.02813
PE Ratio	3.3846	0.6588	2.4331	0.5322	3.102	0.64007
DCF	2.7418	0.6744	2.3704	0.6208	2.3991	0.6469
MetaC - NWC Change	-2.1061	-0.4659	-1.5248	-0.3562	0.8683	0.2121
MetaC - PP&EChange	-2.5015	-0.5302	-1.0452	-0.2528	1.5505	0.3716
MetaC - TA Change	0.6758	0.1666	0.8216	0.2012	0.5859	0.1449
MetaC - NWC/TA Change	-1.1917	-0.2855	-1.3786	-0.3258	0.9326	0.2271
MetaC - PP&E/TA Change	-0.4601	-0.1143	-0.3861	-0.09608	-0.1183	-0.0296
MetaC (NWC+PP&E)/TA Change	-1.4899	-0.3491	-1.7957	-0.4096	-0.3552	-0.08845

* At the 5 % level of significance
* Two – tailed test

Table 2

The Listed and Delisted Company Beta

	1992	1993	1994	1995	1996	1997	1998	1999
Listed Com β	1.3630	0.7459	0.5594	0.6057	0.6561	-0.2587	3.2882	7.1158
Delisted Com β	-0.2991	0.2959	-0.2086	-0.0050	-0.1678	-1.7642	-0.2503	6.5978

Table 3

Share Price Change Rate for Listed and Delisted Company

	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998
Lis Com	-17.40%	6.11%	12.45%	58.86%	7.01%	20.78%	31.55%	9.44%	-24.41%
Delis Com	-9.76%	62.70%	235.40%	22.40%	-18.02%	-25.12%	186.21%	24.50%	-37.55%
	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Lis Com	15.69%	-1.05%	12.87%	-0.55%	2.56%	52.72%	33.42%	41.98%	31.82%
Delis Com	-3.88%	63.05%	19.96%	1.97%	10.38%	99.54%	47.59%	14.45%	189.10%