

WYOMING DEPARTMENT OF REVENUE
MINERAL TAX DIVISION

CAPITALIZATION RATE STUDY

MODIFIED NETBACK RATE OF RETURN

Production Year 2009

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INTRODUCTION

The capitalization rate applied to income is a means of estimating market value for properties. This capitalization rate reflects the relationship between one year's income or an annual average of several years' income and the corresponding capital value. This market value estimated by capitalizing an income is one indicator of what a willing buyer and a willing seller may consider a fair return on their investment in the open market.

The primary components of the capitalization rate are Debt, Preferred (if applicable), and Common Equity. The following data have been assembled to determine a rate of return for the Modified Netback valuation method.

The Mineral Tax Division develops its capitalization rates in accordance with WY Title 39-14-203(b)(6)(E) and WY Title 39-14-201. As such, the capitalization rate used for all producers utilizing the Modified Netback method of valuation is derived from a calculation consisting of the highest ten producers of natural gas in the State of Wyoming.

SOURCES OF INFORMATION AND DATA

Source data used to compute the capitalization rates for the largest ten natural gas producers (top ten producers) was acquired from various sources:

- 1) Mergent Bond Record (January 2010 issue) and Standard & Poor's Record (2010) provided bond ratings for the companies. In addition, the 2008 annual Debt Rates and Preferred Rates by industry grouping came from the same source.
- 2) Value Line provided statistical information. The data from Value Line included Betas, 2009 projected Annual Rates of Change in Earnings, Dividends, Book Value and Annual Total Return. Value Line also provided data for the calculation of the risk free (RF) rates; the specific weekly rates are detailed in Exhibit C of this report.
- 3) The required return on market (RM) came from the MorningStar, Inc. 2010 Year Book, "Basic Series: Summary of Statistics of Annual Returns--1926 to 2009", and is based on the Arithmetic Mean return realized on common stocks. This information source also supplied data used to develop the risk premium (RP) and firm size and adjustments.
- 4) The Wall Street Journal for January 4, 2010, was the source for stock prices for individual companies, as required in the Discounted Cash Flow Model and the Direct Capitalization Rates.
- 5) The Public Utility Financing Tracker provided the data for computing flotation costs.

CAPITAL STRUCTURE

For appraisal purposes, capital structure has three components: long-term debt, preferred stock and net worth (or common equity or, simply, equity). It differs from financial structure, which includes other, primarily, short-term sources of capital, such as payables and operating loans. There are two primary methods of computing capital structure for appraisals - book structure and market structure. Book structure uses the relationships of the book values (i.e., accounting values) of debt, preferred and equity. Market structure uses the market values of these components. The appropriate capital structure to use in a capitalization rate study for the modified netback rate of return is the market structure of the publicly traded companies (often the parent holding companies) because it reflects the structure which a typical purchaser would probably use to acquire the operating assets of a subject company. To compute market capital structure, we used the book value of debt and preferred securities (since there usually are no material differences between book and market value for these securities), as reported in Value Line. We computed the market value of common equity by multiplying the shares outstanding by the recent price, also as reported in Value Line. The average market capital structure for the companies in the study population is as follows:

	DEBT	PREFERRED	EQUITY
Top 10 Producers	17%	0%	83%

Table 1. Capital Structure

These percentages will later be used to compute the cost of capital for the industry.

COST OF DEBT AND PREFERRED

The cost of debt and preferred used to compute values for individual companies reflect the Mineral Tax Divisions determination of the risk for the industry as a whole. We believe a spot rate (such as the year-end rate) may result in a one-time irregularity. Therefore, we used an average of the annual high and low rates, as reported by Mergent Bond Record & Standard and Poor's, adjusted for flotation cost, as shown in the table below. The rates for debt and preferred are calculated using a weighted average of the top ten producers as required by WY Title 39-14-201(a)(xxxiii).

	DEBT	PREFERRED
Top 10 Producers	6.16%	6.73%

Table 2: Debt and Preferred Rates

COST OF EQUITY

The current cost of equity capital should be based on data taken from the capital markets for the top ten producers. Equity rates should reflect the representative cost of equity financing for a given industry type as of the appraisal date. There is no single commonly accepted method for making this estimate. However, there are three generally accepted methods which can be used in conjunction with each other. These include (1) the Discounted Cash Flow (DCF) model, (2) Capital Asset Pricing Model (CAPM), and (3) Risk Premium (RP) model.

The Discounted Cash Flow Model (DCF): This model measures the rate of return requirements of industrial stock (equity) as demonstrated by investors in the market. The basic theory of DCF is that the prices paid for a share of stock reflect the investors' discounted present values of future expected earnings/anticipated cash flows for both dividends and stock appreciation. The basic formula appears in the box to the right. The D_1 variable comes from the dividend declared per share Value Line has projected for 2009. P_0 is the average of the annual high and low prices of the stocks of the companies in our study. The growth factor in the model was computed using a weighted average of the growth indicators: Earnings, 1/6; Book Value, 2/6; and Dividends, 3/6. The Department looks at three computations of the DCF to determine the relative propriety of the indicator: 1) a DCF model that reduces the impact of any company for whom the projected dividend or any of the growth factors is "Nil" or "NMF" per Value Line; 2) a DCF model which adjusts for the "Nil" and "NMF" items; and 3) a DCF model calculated on the average dividends, growth factors, and stock prices of the companies in the study group. Application of this model resulted in the equity rate shown in Table 3.

$$K_E = \frac{D_1}{P_0} + G$$

where:
 K_E = Cost of Capital
 D_1 = Projected Dividend
 P_0 = Current Stock Price
 G = Growth

Capital Asset Pricing Model (CAPM): CAPM uses the concept that value is composed of a "safe rate" plus an add-on for equity risk. The market risk premium is defined as the difference between the expected rate of return in a given investment and the "risk-free rate" on government Treasury Bonds. This definition is based upon the premise that an informed investor expects to earn a greater return on his equity capital investment than he would receive from an alternative investment in risk free government bonds. Theoretically, the greater the investor's perceived risk in investment, the greater the risk premium. However, in the CAPM, the risk premium for the overall market must be adjusted by a market risk measure, "Beta", for the companies under review. The basic formula appears in the box at the right. Various versions of the CAPM take into account the different equity perceptions that prevail in the oil and gas industry, i.e. Long-Term, Intermediate, Short-Term and Corporate. Application of this formula to the various risk groups resulted in the use of the rate presented in Table 3.

$$K_E = R_F + B(R_M - R_F)$$

where:
 K_E = Cost of Capital
 R_F = Risk Free Rate
 B = Beta
 R_M = Return on the Market

Risk Premium Model (RP): This model assumes that the rate of return required by equity investors depends upon: (1) the risk-free rate of return or what investors could obtain by investing in Treasury Bonds, which have an assured rate of return guaranteed by the U.S. Government, and (2) some risk premium, or an amount of compensation above the risk-free rate required to induce investors to invest their money in a risky stock. The formula appears in the box on the right. Various versions of the Risk Premium consider the different equity perceptions that prevail in the oil and gas industry, i.e. Long-Term, Intermediate, Short-Term and Corporate.

$$K_E = R_F + R_P$$

where:
 K_E = Cost of Capital
 R_F = Risk Free Rate
 R_P = Risk Premium

As a matter of form, the Department calculates Long-Term, Intermediate, Short-Term and

Corporate rates for both the CAPM and RP models. We then determine which rate is most appropriate for the top ten producers. The two primary considerations are the nature the operating assets and the term of debt instruments for companies within the industry. Generally speaking, the major assets of oil and gas companies have useful lives in excess of twenty years. Further, these oil and gas companies often issue debt with maturities in excess of twenty years. For these reasons, we consider the long-term rate, as shown in the table below, to be the most appropriate for the ten oil and gas companies used as a basis for the rate of return calculation.

	DCF	CAPM	RP
Top 10 Producers	9.37%	10.69%	10.59%

Table 3: Equity Rates

CONCLUSION REGARDING THE EQUITY RATE

For the cost of equity, rates from the CAPM, RP model and the traditional DCF models were given consideration for the ten oil and gas companies. The resulting equity capitalization rate, adjusted for flotation cost for the top ten producers is 10.56%.

FLOTATION COST ADJUSTMENTS

The costs of the various types of capital determined in the previous sections of this report consider only secondary market rates, the rates of return to be earned by the holders of the securities. These rates do not reflect any adjustment for primary costs, those costs a company incurs to raise capital initially. When a company issues new securities, it incurs legal, underwriting and accounting expenses. These expenses are known as “flotation” costs. They reduce the amount of actual proceeds the company receives from the issuance of the securities. As a result the effective required rates of return for the different types of securities are somewhat higher than the secondary rates indicate. Flotation costs are expressed as a percentage of the proceeds of the issue. To determine the true cost of capital the secondary rates must be adjusted for the flotation costs.

The objective of the flotation cost adjustment is to determine the effective rate of return for a security based on the net proceeds from the security issue. To calculate the real required rate of return for the two basic types of securities (debt and equity), we use the formulas in the box to the right. (Note: the term “equity” applies to both common and preferred stock issues.)

The formula for the debt rate requires some explanation. The reason for the income tax rate adjustment lies in the nature of flotation costs for debt issues. Under income tax law such costs are amortized and deducted to determine taxable income; however, they are not deductible to determine net operating income.

For Debt:

$$K_A = \frac{K_B}{1 - (FC \times (1 - TR))}$$

For Equity (Common and Preferred):

$$K_A = \frac{K_B}{1 - FC}$$

where:

K_A = Adjusted Cost of Capital

K_B = Unadjusted (Base) Cost of Capital

FC = Flotation Cost as a Percentage

TR = Income Tax Rate (38%)

Thus, the flotation cost has to be adjusted to recognize the difference between the tax treatment and the appraisal treatment of the flotation costs. There is no similar adjustment to the flotation costs for equity issues because they are not deductible for income tax purposes; the financial statements of the issuer simply reflect the net proceeds of the issue. The Department uses an income tax rate of 38% to incorporate the maximum federal corporate income tax rate of 35% plus an allowance of three percentage points for an average effective state corporate income tax rate.

OVERALL WEIGHTED AVERAGE COST OF CAPITAL

The Mineral Tax Division computed an overall weighted average cost of capital using the band of investment method. The basic formula appears in the box at the right. The resulting capitalization rate (also known as the discount rate) will be applied to the appropriate income stream to determine indicators of the current market value for the top ten producers. The results of this band of investment analysis for the cost of capital appear in Exhibit A.

$$K = (D \times D_R) + (P \times P_R) + (E \times E_R)$$

where:

K = Weighted Average Cost of Capital

D = Percent of Debt in Capital Structure

D_R = Cost of Debt (Debt Rate)

P = Percent of Preferred in Capital Structure

P_R = Cost of Preferred (Preferred Rate)

E = Percent of Equity in Capital Structure

E_R = Cost of Equity (Equity Rate)

DIRECT CAPITALIZATION

Direct capitalization is a valuation technique which takes a single year's income (or some other common unit of comparison) divided by a rate (or multiplied by a factor) to derive an estimate of value. This technique is often used in real estate appraisal to determine an overall or total valuation of the property. Income, whether potential gross income, effective gross income, or net operating income, is divided by the sales prices for comparable properties and the resulting ratio is then divided into the same level of income for the subject property to determine an overall valuation estimate.

This approach is not limited to various levels of income. The same concepts are used in the sales comparison approach, where various units of comparison are divided into the sales prices of comparable properties. The resulting rates (ratios) are then divided into the comparable units for the subject property to calculate an overall value.

The same procedures can be applied to ten producers. However, because direct capitalization is a comparable sales technique, it requires a higher level of comparability between the subject property (company) and the comparables than is required for yield capitalization. The process is one of identifying units of comparison, dividing such units by the sales price and applying the resulting average factor to the subject property (company). In the Direct Capitalization Study the goal is to develop value estimates for three distinct components system value: equity, preferred, and debt. This is a similar concept to the use of the Band of Investment method of rate development.

The Capitalization Rate Study lists six units of comparison for equity value from the December 2009, issue of The Value Line Investment Survey for the ten producers. All six units are shown on a per share basis for each individual company within the industry. The price per share used to compute the ratios is the same average of the 52-week highs and lows of the publicly traded prices for the preceding calendar year use in the DCF model. The resulting ratios appear in the table below. They are then divided into the appropriate figures for the subject company to obtain the estimate of value for the equity portion of the company.

	RATE
Revenue (Sales) per Share	93.82%
“Cash Flow” per Share	18.28%
Earnings per Share	7.28%
Dividends Declared per Share	3.58%
Capital Spending/Gross Equipment per Share	19.37%
Book Value per Share	70.36%

Table 4. Direct Capitalization Rates

It is important to emphasize that the developed value represents the value of the equity portion of the company, not the value of the item capitalized. This is because the basis for all the ratios is price per share of the common stock (or equity) of the company. After developing the equity value, the value of the preferred stock and the long-term debt must be derived directly from the market.

The market value of the preferred stock (if applicable) is obtained by dividing the preferred dividends paid by the subject company by the market preferred yield rate. This rate is found within the Capitalization Rate Study on page 2. The market value of the long-term debt is likewise found by dividing the long-term interest expense by the debt yield rate. Finally, the three portions (equity, preferred stock, and long-term debt) are added together to develop an estimate of the total value for the company.

The final step in calculating the Direct Capitalization indicator of value is to determine the market value for the operating property. It uses a factor developed in the stock and debt approach to remove non-operating property from the value of the company. Ratios that are generally utilized are the asset influence (operating assets divided by total assets), the income influence (operating income divided by total income), or an average of the two. The value of the non-operating property is thus excluded from the total valuation to determine the final value for the operating property by the Direct Capitalization approach.

EXHIBIT A

WEIGHTED AVERAGE COST OF CAPITAL

Production Year 2009 Rate of Return on Investment

<u>Type of Capital</u>	<u>Cost of Capital</u>	<u>Flotation Cost</u>	<u>Adjusted Cost of Capital</u>	x	<u>Percent of Structure</u>	=	<u>Weighted Average Cost of Capital</u>
Debt	6.70%	1.10%	6.77%		15%		1.0020%
Preferred	6.70%	2.26%	6.85%		0%		0.0000%
Equity	11.18%	3.79%	11.62%		85%		9.9002%
Modified Netback Rate of Return							<u><u>10.9022%</u></u>

EXHIBIT B

STANDARD AND POOR'S

Wyoming Department of Revenue
Netback Return on Investment Calculation
2008 Debt to Equity Ratio's
Production Year: 2009

Company Name	Standard & Poors	Mergent
Encana	<i>Missing</i>	<i>Missing</i>
Exxon Mobil Corp.	AAA	A-1+
Anadarko Petroleum Corp.	BBB-	A-3
Questar Corp.	NR	A-2
BP America Production Co.	AA	A-1+
Ultra Petroleum	<i>Missing</i>	<i>Missing</i>
Shell Oil Co.	AA+	A-1+
ConocoPhillips	A	A-1
Devon Energy Corp.	BBB+	A-2
Chevron Corp.	AA	A-1+

EXHIBIT C

RISK FREE RATES

Risk Free Rate for 2009 Capitalization Rates

Long Term Risk Free Rate: 3.96%

Source:
2008 Federal Reserve Bulletin monthly 20 year
Treasury Bond yields with constant maturity

Intermediate Risk Free Rate: 2.46%

Source:
2008 weekly Value Line Investment Survey
Selection & Opinion reports, "Selected Yields"
Section, average of the annual high and low for the
weekly 5 year US Treasury Securities yield rates

Short Term Risk Free Rate: 1.63%

Source:
2008 weekly Value Line Investment Survey
Selection & Opinion reports, "Selected Yields"
Section, average of the annual high and low for the
weekly 3 month US Treasury Securities yield rates

Corporate Risk Free Rate: 5.50%

Source:
~~2008 weekly Value Line Investment Survey~~
Selection & Opinion reports, "Market Monitor"
Section, average of the annual high and low for the
weekly Mergent Aaa Corporate bond yield

Prime Lending Rate: 3.25%

Source:
Wall Street Journal, January 2, 2009 edition,
"Money Rates" section

EXHIBIT D

MORNINGSTAR INC. DATA

Morningstar Inc.
SBBI 2009 Yearbook
(Market Results for 1926 - 2008)

<u>Series</u>		<u>Geometric Mean</u>	<u>Arithmetic Mean</u>	<u>Standard Deviation</u>
Large Company Stocks	Total Return	9.60%	11.70%	20.60%
Small Company Stocks	Total Return	11.70%	16.40%	33.00%
Long-Term Corporate Bonds	Total Return	5.90%	6.20%	8.40%
Long-Term Government Bonds	Total Return	5.70%	6.10%	9.40%
	Income Return	5.20%	5.20%	2.70%
Intermediate-Term Government Bonds	Total Return	5.40%	5.60%	5.70%
	Income Return	4.70%	4.70%	2.90%
U.S. Treasury Bills	Total Return	3.70%	3.80%	3.10%
Inflation		3.00%	3.10%	4.20%

	<u>Long Term Equity Risk Premium</u>	<u>Intermediate Equity Risk Premium</u>	<u>Short Term Equity Risk Premium</u>	<u>Corporate Equity Risk Premium</u>
RP Rate Calculation (Rated Companies) <i>(Using Arithmetic Means)</i>				
Base:				
Total return on Large Company Stocks	11.70%	11.70%	11.70%	11.70%
Risk Free Rates:				
Income Return on Long-Term Government Bonds	5.20%			
Income Return Intermediate-Term Government Bonds		4.70%		
Total Return on U.S. Treasury Bills			3.80%	
Total Return on Long-Term Corporate Bonds				6.20%
Equity Risk Premiums	6.50%	7.00%	7.90%	5.50%