Midland Energy Resources

Case Study Report

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Abstract-

Effective capital management is pivotal for sustainable growth and risk mitigation in corporations. This analysis delves into how Midland Energy Resources strategically oversees its capital costs, with a keen emphasis on its diverse international portfolio in the energy sector, encompassing exploration, refining, and distribution of oil and gas, alongside its ventures in petrochemicals. By meticulously evaluating the annual capital costs across its business units, Midland ensures that its investment decisions are data-driven and aligned with its strategic goals. The cornerstone of these financial evaluations is the adept use of a tailored WACC, which reflects the company's specific risk profile and financial targets. The insights garnered from these evaluations are instrumental in guiding asset valuation, shaping merger and acquisition strategies, and informing stock buyback policies. The ensuing recommendations are poised to fortify Midland's financial fortitude, ensuring its competitive edge as an energy conglomerate with a global reach. The report provides a detailed roadmap for navigating the complexities of capital cost assessments, ensuring that Midland's financial decisions bolster its trajectory of growth and market leadership.

Introduction

Midland Energy Resources, a global energy conglomerate, faces the intricate task of determining the cost of capital for its overall operations and individual divisions. The introduction outlines the company's diversified portfolio, including E&P, R&M, and Petrochemicals, highlighting the challenges in financial assessments and strategic decision-making. The focus is on analytical aspects, particularly how these estimations impact various financial decisions and the necessity of a precise, tailored approach in calculating the cost of capital, considering the unique characteristics of each division.

Background

Midland Energy Resources, a multinational enterprise, has carved out a significant presence in the energy sector through its involvement in exploration, refining, and petrochemicals. With a robust operating income and an upward trajectory in oil production, Midland stands out in the competitive landscape. The year 2006 was notable for a 6.3% production boost and an anticipatory surge in capital expenditures for the following two years.

The company's financial acumen is evident in its strategic expansion abroad, particularly through lucrative foreign partnerships, which bolstered its 2006 equity affiliate earnings to an impressive $4.75 billion. Midland's prudence is reflected in its careful risk management across currency, interest rates, and commodities. Utilizing a thorough valuation method, Midland engages in share repurchase only when its stock appears undervalued, thereby negotiating economic risks strategically. Looking ahead, Midland's goal is to refine its capital strategy further and enhance its debt management, leveraging its diversified operations to cement its place as a leader in the global energy market.

In essence, Midland Energy Resources adeptly manages a complex portfolio, balancing capital cost estimations against the operational diversity of its segments. The company underscores the importance of these valuations in financial planning and strategic investments, ensuring that each segment's unique financial footprint is accurately reflected in the broader corporate strategy. The narrative underscores the analytical rigor required in financial planning, emphasizing the impact of capital cost calculations on the company's strategic direction and investment decisions.

Problem Solving-

Midland Energy Resources is faced with the challenge of strategic planning for the future development of its divisions. To navigate this complexity, the company must refine its approach to estimating the cost of capital. By leveraging detailed financial analysis, Midland can discern the most lucrative investments and identify opportunities for mergers, acquisitions, or share repurchases. The approach hinges on a precise calculation of the Weighted Average Cost of Capital (WACC) for each division and the business as a whole, ensuring that the financial models and parameters, such as adjusted equity betas, are meticulously tailored to the company's operational profile. This rigorous financial assessment aligns with Midland's diverse activities and strategic initiatives, providing a foundation for decisions that will propel the company's growth in its competitive, multifaceted market.

Detailed Analysis of Financial Exhibits:

- Critical Assumptions in Estimating Cost of Capital

Developing an accurate estimation of a company's cost of capital requires making prudent assumptions around key inputs data. While real-world data would be plugged in for practical implementations, certain reasonable assumptions must be made in this case analysis of Midland's cost of capital calculations. These data choices set the stage for subsequent weighted average cost of capital (WACC) and capital asset pricing model (CAPM) calculations.

- Capital Structure Decisions

A vital assumption is Midland's capital structure, dictated by the debt-to-value ratio target for the year ahead, as set based on management deliberations. This ratio determines the proportional weights assigned to debt and equity components in the WACC formula. The report assumes the ratio target aligned with executives' vision for optimal mix between financing sources to fund upcoming projects and operations.

- Choice of Risk-free Rate

The risk-free rate represents the guaranteed base return offered by assets like short-term government securities. As Midland's energy sector investments typically focus on long-duration projects, the report assumes the 30-year US Treasury bond as the risk-free benchmark. Using the 30-year rate ensures higher return requirements reflecting extended time horizons for exploration, production, refining, and petrochemical ventures.

- Equity Risk Premium

Another key assumption is selecting the equity risk premium over risk-free returns, representing compensation desired by stock investors for heightened risk. This feeds into CAPM's cost of equity calculations, which subsequently impacts WACC. The report assumes a 5% premium, in line with historical US stock market returns over 30-year US Treasury bonds.

- Tax Rates

The corporate tax rate assumptions also influence WACC outcomes, since higher tax rates reduce net returns for shareholders. The report applies prevailing federal tax rates for large corporations in the US, with brackets for income over $10 million and $15 million.

- Beta Factors

Unlevered beta factors reflect volatility of returns uninfluenced by capital structure choices. The report calculates unlevered betas for Midland's divisions via weighted averages of competitor betas. The weights used are competitors' equity values, proxying for comparative market positions. This provides sector-specific beta benchmarks to inform cost of equity estimations while evaluating projects.

The thoughtful selection of these vital data parameters provides the foundation for Midland to build WACC and CAPM models that reliably estimate all-in costs for capital allocation decisions across business divisions. Assumptions must continually align with company realities and strategies for sustained, robust estimations.

WACC-

The weighted average cost of capital (WACC) is a pivotal metric reflecting financing costs incurred by a company across all funding sources for asset and project investments. Unlike operating costs tied to internal business processes, WACC specifically captures external capital costs - compensation paid to capital providers. This blended cost rate informs decisions on undertaking investments by quantifying total required returns to satisfy debt and equity investors.

Determining the composite WACC requires first separately calculating key component costs of debt and equity. Debt costs depend on factors like interest rates and tax rates associated with bonds and loans used. Equity costs rely on investors' return expectations depending on perceived risks and capital market conditions. These distinct component costs and their relative weights, based on how much debt versus equity finances the firm's assets, collectively determine WACC.

The WACC percentage essentially reveals returns a company must earn on deployed capital to adequately reward lenders and shareholders without overleveraging itself. By illuminating holistic capital costs, WACC provides the crucial analytical basis for corporations to judiciously allocate resources towards productive avenues aligned with overall strategic targets. Hence its preeminent status as a centralized financial metric guiding capital budgeting and investment decisions.

Cost of Equity Calculation (CAPM formula):

Framework - Expected Return (Re) = Risk-free rate (Rf) + (Beta * Market Risk Premium)

1. Risk-Free Rate (Rf): Typically, this is the yield on government treasury bonds. From your provided data, we would take the 10-year or 30-year Treasury yield as a proxy for Rf. Let's use the 30-year rate of 4.98% from 2006 as an example.

2. Beta (β): This is the measure of the equity's volatility in relation to the market. Midland's beta was 1.25.

3. Equity Market Risk Premium (EMRP): This is the return expected from the market above the risk-free rate. In the case study, Midland used an EMRP of 5.0%.

This model describes the relationship between the expected return and risk of investing in a security/asset. This is how we calculated the cost of equity or the expected return for the Midland Energyfirm and the three divisions.

Cost of Equity or Expected Return: -

Midland Energy	11.29%
Petrochemical Division	7.42%
E&P Division	11.68%
R&M Division	11.45%

To determine the Weighted Average Cost of Capital (WACC) for Midland Energy and its three divisions, we will apply the WACC formula, which is as follows:

$$WACC = \left(\frac{E}{V} \times R_e\right) + \left(\frac{D}{V} \times R_d\right) \times (1 - T)$$

In this formula:

- $\frac{E}{V}$ represents the ratio of the market value of the company's equity to its total value.
- $\frac{D}{V}$ denotes the ratio of the market value of the company's debt to its total value.
- R_e is the Cost of Equity, and R_d is the Cost of Debt.
- T signifies the Tax Rate.

This framework will be instrumental in calculating the capital costs for both the parent company and each of its divisions.

WACC Table-

Function	Midland Energy	Petrochemical Division	E&P Division	R&M Division
Calculate WACC	= (0.5780 * 11.29%) + (0.4220 * 6.28 * (1-39.73%)	= (0.6 * 7.42%) + (0.4 * 6.01 * (1-39.73%)	= (0.54 * 11.68%) + (0.46 * 6.26 * (1-39.73%)	= (0.69 * 11.45 %) + (0.31 * 6.46 * (1 - 39.73%)
Final WACC	8.13	5.89	8.05	9.12

Function	Midland Energy	Petrochemical Division	E&P Division	R&M Division
Calculate WACC	1.66250763	1.4934108	1.7986069	1.285972
Final WACC	8.13	5.89	8.05	9.12

Conclusion (Recommendation)

This comprehensive study of Midland Energy Resources' financial architecture, particularly focusing on the Weighted Average Cost of Capital (WACC), reveals a profound understanding of the company's capital allocation dynamics. Utilizing a 39.50% tax rate, reflective of the corporate tax obligations, and the stability offered by the 30-year US Treasury rate, Midland's approach to capital cost estimation is both precise and strategically significant.

The division-specific WACC calculations furnish Midland with the acumen to tailor its investment strategies effectively, ensuring a harmonious alignment with each division's market realities and the broader corporate objectives. These finely tuned WACC metrics facilitate informed investment decisions, prioritizing projects that promise the greatest value creation.

Key recommendations for Midland include:

- Exploiting lower WACCs in certain divisions to responsibly increase debt capacity, fostering robust growth.
- Periodically reassessing and adjusting the capital structure for optimal financial flexibility.
- Pursuing strategic mergers and acquisitions that align with long-term goals and expansion strategies.
- Continuously updating WACC calculations to reflect changing economic conditions, maintaining a proactive financial posture.
- Enhancing transparency in shareholder communications to build trust and confidence in Midland's financial governance.

In conclusion, Midland's commitment to disciplined financial management and adaptive capital allocation is essential for its sustained competitive advantage. By aligning its financial strategies with an analytically rigorous WACC, Midland is well-equipped to navigate the challenges of the global energy market, ensuring its growth and stability. This approach is critical for Midland's ongoing success, enabling it to capitalize on opportunities while safeguarding its robust financial health in an unpredictable global economy.

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Appendix

The appendix includes detailed computational methodologies, data sources, and explanations for selected parameters and models. It provides a comprehensive breakdown of the WACC and CAPM calculations, the rationale for choosing specific market values, debt and equity costs, and tax rates. The appendix serves as a detailed reference for the analytical processes and assumptions underlying the report's conclusions.

Specific Analysis

The specific analysis section addresses the challenge of calculating the cost of equity under a targeted capital structure. It involves a nuanced understanding of asset beta and equity beta, and the process of deleveraging equity beta using the current debt-to-equity ratio to derive the asset beta. Subsequently, the equity beta is recalculated with the targeted debt-to-equity ratio. This detailed analysis is pivotal in accurately assessing the cost of equity for Midland, considering its complex capital structure and varied operational divisions.

Table 1

Business Segment:	Credit Rating	Debt/ Value	Spread to Treasury
Consolidated	A+	42.2%	1.62%
Exploration & Production	A+	46.0%	1.60%
Refining & Marketing	BBB	31.0%	1.80%
Petrochemicals	AA-	40.0%	1.35%

Note: Debt/Value is based on market values.

At December 31, 2006, the company's debt was rated A+ by Standard & Poor's. **Table 2** gives yields to maturity for U.S. Treasury bonds in January 2007.

Table 2

Maturity:	Rate:
1-Year	4.54%
10-Year	4.66%
30-Year	4.98%

As we know that the cost of debt equals the yield, which is determined by adding the Treasury Yield to the Spread. Following this, we can proceed to calculate the cost of equity and its respective components across the three segments.

The proportion of debt to total value for Midland Energy stands at 42.2%, while for its Exploration and Production (E&P) division, it is 46.0%. In the Refining and Marketing (R&M) sector, this ratio is 31.0%, and for the Petrochemicals division, it's 40.0%. The benchmark for the risk-free rate used in this analysis is the 10-year maturity rate, currently at 4.66%.

Exhibit 1 Midland Income Statements, Years ended December 31 ($ in millions)

Operating Results:	2004	2005	2006
Operating Revenues	**201,425**	**249,246**	**248,518**
Plus: Other Income	1,239	2,817	3,524
Total Revenue & Other Income	**202,664**	**252,062**	**252,042**
Less: Crude Oil & Product Purchases	94,672	125,949	124,131
Less: Production & Manufacturing	15,793	18,237	20,079
Less: Selling, General & Administrative	9,417	9,793	9,706
Less: Depreciation & Depletion	6,642	6,972	7,763
Less: Exploration Expense	747	656	803
Less: Sales-Based Taxes	18,539	20,905	20,659
Less: Other Taxes & Duties	27,849	28,257	26,658
Operating Income	**29,005**	**41,294**	**42,243**
Less: Interest Expense	10,568	8,028	11,081
Less: Other Non-Operating Expenses	528	543	715
Income Before Taxes	**17,910**	**32,723**	**30,447**
Less: Taxes	7,414	12,830	11,747
Net Income	**10,496**	**19,893**	**18,701**

The tax rate is calculated as the sum of the ratios of taxes to income before taxes for the years 2004, 2005, and 2006, resulting in a combined rate of 39.73%.

Exhibit 5 Comparable Company Information ($ in millions)

Exploration & Production:	Equity Market Value	Net Debt	D/E	Equity Beta	LTM Revenue	LTM Earnings
Jackson Energy, Inc.	57,931	6,480	11.2%	0.89	18,512	4,981
Wide Plain Petroleum	46,089	39,375	85.4%	1.21	17,827	8,495
Corsicana Energy Corp.	42,263	6,442	15.2%	1.11	14,505	4,467
Worthington Petroleum	27,591	13,098	47.5%	1.39	12,820	3,506
Average			**39.8%**	**1.15**		
Refining & Marketing:						
Bexar Energy, Inc.	60,356	6,200	10.3%	1.70	160,708	9,560
Kirk Corp.	15,567	3,017	19.4%	0.94	67,751	1,713
White Point Energy	9,204	1,925	20.9%	1.78	31,682	1,402
Petrarch Fuel Services	2,460	(296)	-12.0%	0.24	18,874	112
Arkana Petroleum Corp.	18,363	5,931	32.3%	1.25	49,117	3,353
Beaumont Energy, Inc.	32,662	6,743	20.6%	1.04	59,989	1,467
Dameron Fuel Services	48,796	24,525	50.3%	1.42	58,750	4,646
Average			**20.3%**	**1.20**		
Midland Energy Resources	**134,114**	**79,508**	**59.3%**	**1.25**	**251,003**	**18,888**

Market values are based on 12/31/06 closing prices. The average stock price for MIDLAND during 2006 was $42.31, and the average shares outstanding were 2,951 million.

The table indicates that the equity beta for Midland Energy is 1.25. For the Exploration & Production division, the equity beta is 1.15, while for the Refining & Marketing division, it is 1.20. Additionally, the debt-to-equity ratios are as follows: 59.3% for Midland, 39.8%

for the Exploration & Production segment, and 20.3% for the Refining & Marketing segment.

For Midland WACC

Midland Energy	
Cost of Debt	6.28%
Risk free Rate	4.66%
Tax Rate	39.50%
Beta of Midland given	1.25
Division Debt/Equity	59.30%
Unlevered	0.9200
Debt/Value	0.422
Equity/value	0.578
Target Debt/Equity	0.7301
Relevered Beta	1.3263
EMRP	5.00%
Cost of equity	11.29%
WACC	8.13%

Unlevered beta (Midland Energy) = Beta (Midland) / (1+(1-tax rate) * D/E ratio (Midland)) = 1.25/ (1+(1-39.73%) *59.3%) = 0.9208774

Target D/E(Midland) = 0.422/0.578 =0.73

Relevered beta (Midland) = Unlevered beta*(1+(1-tax rate) *Target D/E(Midland) = 0.9208774*(1+(1-39.50%) *0.73) = 1.32

Cost of equity = Rf + Rbeta*(EMRP) = 4.66% + 1.32*5% = 11.26%

WACC(Midland) = Wd (debt/value) + Rd (cost of debt) *(1-tax rate) + We (equity/value) *Re (cost of equity) = 0.422*6.28%*(1-39.50%) + 0.578*11.26% = 8.13%

For WACC of E&P Division:

E & P	
Cost of Debt	0.0626
Risk free Rate	0.0466
Tax Rate	0.395
Beta of division given	1.15
Division Debt/Equity	0.398
Unlevered	0.9268
Debt/Value	0.46
Equity/value	0.54
Target Debt/Equity	0.8519
Relevered Beta	1.4045
EMRP	5.00%
Cost of equity	11.68%
WACC	**8.05%**

Unlevered beta (E&P) = 1.15/ (1+(1-39.73%) *39.8%) = 0.92751315 Target D/E (E&P) = 0.46/0.54 = 0.85185185
Relevered Beta = 0.92751315*(1+(1-39.73%) *0.85185185) =1.40370871
Cost of equity = 4.66% + 1.40370871*5.0% = 11.68%
WACC（E&P） = 0.46*6.26%*(1-39.73%) + 0.54* = 8.05%

For WACC of R&M Division:

R & M	
Cost of Debt	0.0646
Risk free Rate	0.0466
Tax Rate	0.395
Beta of Division given	1.2
Div Debt/Equity	0.203
Unlevered	1.0687
Debt/Value	0.31
Equity/value	0.69
Target Debt/Equity	0.4493
Relevered Beta	1.3592
EMRP	5.00%
Cost of equity	11.46%
WACC	**9.12%**

Unlevered beta = 1.2/ (1+(1-39.73%) *20.30%) = 1.07 Target D/E = 0.31/0.69 = 0.449275362
Relevered Beta = 1.07*(1+(1-39.73%) *0.449275362) = 1.358699599
Cost of equity = 4.66% + 1.358699599*5.0% = 11.45%
WACC（R&M） = 0.31*6.46%*(1-39.73%) + 0.69*11.45% = 9.11%

For WACC of Petrochemical Division:

Exhibit 3 Midland Segment Data ($ in millions)

Exploration & Production:	2004	2005	2006
Operating Revenue	15,931	20,870	22,357
After-Tax Earnings	6,781	13,349	12,556
Capital Expenditures	6,000	7,180	7,940
Depreciation	4,444	4,790	5,525
Total Assets	76,866	125,042	140,100

Refining & Marketing:	2004	2005	2006
Operating Revenue	166,280	206,719	202,971
After-Tax Earnings	2,320	4,382	4,047
Capital Expenditures	1,455	1,550	1,683
Depreciation	1,620	1,591	1,596
Total Assets	60,688	91,629	93,829

Petrochemicals:	2004	2005	2006
Operating Revenue	19,215	21,657	23,189
After-Tax Earnings	1,394	2,162	2,097
Capital Expenditures	305	330	436
Depreciation	578	591	642
Total Assets	19,943	28,000	28,450

We need data from the 2006.

Calculation of Weights	
Division	Assets
E&P	140100
R&M	93829
Petrochemical	28450
Total Assets	262379
Weights	
E&P	0.53
R&M	0.36
Petrochemical	0.11

Unlevered Beta of Petrochemical	0.390
Unlevered Beta of Midland	0.920
Unlevered of E&P	0.927
Unlevered of R&M	1.07

Ubeta (Petro)*0.11 + 0.927*0.53 + 1.07*0.36 = 0.920

Petrochemical Division	
Cost of Debt	6.01%
Risk free Rate	4.66%
Tax Rate	39.50%
Beta of Midland given	0.3897
Division Debt/Equity	
Unlevered	0.3897
Debt/Value	0.4
Equity/value	0.6
Target Debt/Equity	0.6667
Relevered Beta	0.5469
EMRP	5.00%
Cost of equity	7.39%
WACC	**5.89%**

Target D/E = 0.4/0.6 = 0.67
Relevered Beta = 0.393*(1+(1-39.73%)*0.67 = 0.55
Cost of equity = 4.66% + 0.55*5.0% = 7.42%
WACC = 5.89%