

Interstate Natural Gas Pipeline Industry

2009 Cost of Capital Study

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Common Terms

CAPM	Capital Asset Pricing Model
CPI	Consumer Price Index
DCF	Discounted Cash Flow
EIA	Energy Information Administration
FED	Federal Reserve
FERC	Federal Energy Regulatory Commission
GDP	Gross Domestic Product
GP	General Partner
GRI	Gas Research Institute
GSR	Gas Supply Realignment
GTI	Gas Technology Institute
INGAA	Interstate Natural Gas Association of America
IBES	Institutional Brokers Estimate System
INGPC	Interstate Natural Gas Pipeline Company
INGPI	Interstate Natural Gas Pipeline Industry
INGPPTF	Interstate Natural Gas Pipeline Property Tax Forum
LDC	Local Distribution Company
LNG	Liquified Natural Gas
M&A	Mergers and Acquisitions
MLP	Master Limited Partnership
NUOI	Net Utility Operating Income
OCS	Outer Continental Shelf
PFRB	Philadelphia Federal Reserve Bank
PUHCA	Public Utility Holding Company Act
RP	Risk Premium
SFV	Straight Fixed Variable
S&P	Standard & Poor's
VL	Value Line Investment Survey
WACC	Weighted Average Cost of Capital
YTM	Yield to Maturity

2009 Cost of Capital Study of the Interstate Natural Gas Pipeline Industry for the Interstate Natural Gas Pipeline Property Tax Forum January 1, 2009

Purpose of the Cost of Capital Study

The purpose of the cost of capital study is to provide the Interstate Natural Gas Pipeline Property Tax Forum (INGPPTF) with a cost of capital study for the Interstate Natural Gas Pipeline Industry (INGPI) as of January 1, 2009. This cost of capital can be used to capitalize the net cash flow for the typical interstate natural gas pipeline company for the purpose of estimating market value. The cost of capital derived in this study is the cost of capital for the typical interstate natural gas pipeline company at January 1, 2009, and is not representative of any particular interstate pipeline company. Thus, we advise against its random use by anyone without first examining and determining the differences between the specific pipeline company and the typical pipeline represented by the cost of capital herein and adjusting for the differences accordingly. For example, if one were interested in the typical cost of capital for a mid-cap or a low-cap pipeline, size adjustments of 0.94% and 1.74% respectively would need to be made to the capital asset pricing model.¹ Further, for companies which are considered below investment grade, additional adjustments must be made to reflect the enhanced risk associated with an investment in the operating assets of such companies.

Introduction and Scope

This copyrighted study was prepared for the Interstate Natural Gas Pipeline Property Tax Forum and any use of this material by any entity other than those approved by the INGPPTF is expressly prohibited by the authors, who reserve all rights to any reproduction. We have reviewed financial and economic information, analytical reports, and statistics in order to estimate the cost of capital of the Interstate Natural Gas Pipeline Industry as of January 1, 2009.

Executive Summary - Cost of Capital

Based on our analysis and investigation, we have calculated the weighted average cost of

¹ 2009 Ibbotson Risk Premia Over time Report, preliminary data (final unavailable).

capital (WACC) for the INGPI to be **10.95%** as of January 1, 2009. The cost of capital developed in this study is appropriate to use in discounting the after-tax operating cash flows projected as of January 1, 2009 for determination of the market value of the operating assets, tangible and intangible, of the INGPI. After-tax operating cash flows are known as earnings before the deduction of interest, depreciation and amortization and after the deduction of taxes and capital expenditures. For market valuation purposes, this level of cash flow is estimated typically by assuming that depreciation and amortization equals capital expenditures. Thus, the cash flow to be discounted is assumed to be equal to what is commonly known in the INGPI as net utility operating income (NUOI). The detailed discussion of the derivation of the weighted average cost of capital along with supporting documentation begins on page 13.

Interstate Natural Gas Pipeline Property Tax Forum

The current members of the INGPPTF are listed below:

Boardwalk Pipeline Partners, LP	Oneok Partners, LP
Texas Gas Transmission, LLC	Guardian Pipeline Company
Gulf South Pipeline Company, LP	Midwestern Gas Transmission Company
Gulf Crossing Pipeline Company, LLC	Viking Gas Transmission Company
Centerpoint Energy	Questar Pipeline Company
Centerpoint Energy Gas Transmission	Southern Star Central Gas Pipeline, Inc.
Centerpoint Energy Mississippi River Transmission	Southern Union Company
Columbia Gas/Gulf Transmission Corporation	Florida Gas Transmission Co., LLC
Dominion Transmission Corporation	Panhandle Eastern Pipeline, LLC
El Paso Corporation	Trunkline Gas Company, LLC
El Paso Natural Gas	Sea Robin Pipeline, LLC
Mojave Pipeline	Spectra Energy Corp
Colorado Interstate Gas	Texas Eastern Transmission
Cheyenne Plains Pipeline	Algonquin Gas Transmission
Southern Natural Gas	Gulf Stream Natural Gas Transmission
Tennessee Gas Pipeline	Maritimes and Northeast Pipeline
Wyoming Interstate Company	East Tennessee Natural Gas
Kern River Gas Transmission	TransCanada USA Pipelines Limited
Kinder Morgan, Inc.	ANR Pipeline
Natural Gas Pipeline Company of America	Great Lakes Gas Transmission LP
KN Energy	TransCanada Northwest Gas Transmission
Rockies Express	TransCanada Portland Gas Transmission
MDU Resources Group, Inc.	Williams
National Fuel Gas Supply Corporation	Northwest Pipeline GP
Northern Border Pipeline Company	Transcontinental Gas Pipeline Corp.
Northern Natural Gas Company	

General Economic Trends - 2009

When economists made their forecasts for 2008, most failed to successfully predict the economic events happening to the United States. Wall Street's gurus were bullish heading into 2008. While most predicted a stormy first half, none forecasted the financial hurricane that engulfed investors. The *S&P 500* was down 39.3% in 2008, the worst since a 47.1% drop in 1931, *S&P* said.²

No, 2008 wasn't just a bad year. It was an awful year. A Johnstown Flood kind of year, the kind that wipes out proud, century-old institutions, decimates entire industries, and leaves everyone decidedly poorer and the world profoundly shaken in its wake, according to Alan Murray of the *Wall Street Journal*.³

Even with the economists' 2008 predictions missing the mark, their predictions for 2009 indicated an economic rebound for the United States. In fact, on January 1, 2009 the following excerpt was taken from *USAToday*, "Stock market forecasts tend to be sunny, and 2009 is no exception. Wall Street gurus are again predicting gains for 2009."

However, by the middle of January of 2009 the new media reported predictions of a much gloomier picture. This went to show that the economists that make predictions, in the current economic environment, were having a difficult time. Accuracy of projections in 2008 were dismal. 2009's prediction of a bullish market in the *USAToday* article were tempered by an asterisk. "Wary stock strategists, unsure how the worst financial crisis since the Great Depression would play out, were hedging their bets. Rather than just sharing an opinion about what they thought was the most likely outcome for stocks in their 2009 outlook reports, some strategists were including worst-case and best-case market scenarios that reflect lower-probability outcomes — but ones that couldn't be ruled out. It appeared that uncertainty had finally found a home on Wall Street."⁴

The current recession may turn out to be the longest and most painful downturn since the Great Depression, according to economists in the latest 2009 *Wall Street Journal* economic-forecasting survey. The 54 economists who participated in the survey, on average, forecasted quarterly contractions in gross domestic product (GDP) for the last quarter of 2008 and the first two quarters of 2009. The Commerce Department's preliminary estimate showed a 0.5% decline in quarterly GDP for the third quarter of 2008. If the economists' predictions bear out, this

² Shell, Adam. "5 stock experts see 2009 rebound," *USAToday*, December 30, 2008. B1.

³ Murray, Alan. "2009 Could Be Better Than You Think," *The Wall Street Journal*, January 4, 2009, <http://online.wsj.com/article/SB123103188733751647.html>.

⁴ Shell, Adam. "Outlook good for 2009, with caveats," *USAToday*, January 2, 2009, B1.

would mark the first time GDP had contracted in four consecutive quarters during the postwar period.⁵

The sharp downturn in housing markets across the country, which undermined the solvency of major financial institutions and severely disrupted the functioning of financial markets, led the United States into a recession that would probably be the longest and the deepest since World War II according to the Congressional Budget Office (CBO) in the Economic Outlook released January of 2009. The CBO anticipated that the recession—which began about January 2008—would last well into 2009.⁶

Under an assumption that current laws and policies regarding federal spending and taxation would remain the same, CBO forecasted the following:

- ◆ A marked contraction in the U.S. economy in calendar year 2009, with real (inflation-adjusted) gross domestic product (GDP) falling by 2.2 percent.
- ◆ A slow recovery in 2010, with real GDP growing by only 1.5 percent.
- ◆ An unemployment rate that will exceed 9 percent early in 2010.
- ◆ A continued decline in inflation, both because energy prices had been falling and because inflation excluding energy and food prices—the core rate—tends to ease during and immediately after a recession; for 2009, CBO anticipates that inflation, as measured by the consumer price index for all urban consumers (CPI-U), will be only 0.1 percent.
- ◆ A drop in the national average price of a home, as measured by the Federal Housing Finance Agency's purchase-only index, of an additional 14 percent between the third quarter of 2008 and the second quarter of 2010; the imbalance between the supply of and demand for housing persists, as reflected in unusually high vacancy rates and a low volume of housing starts.
- ◆ A decrease of more than 1 percent in real consumption in 2009, followed by moderate growth in 2010; the rise in unemployment, the loss of wealth, and tight consumer credit will continue to restrain consumption—although lower commodity prices will ease those effects somewhat.
- ◆ A financial system that remains strained, although some credit markets have started to improve; it is too early to determine whether the government's actions

⁵ Izzo, Phil. "Outlook Darkens as Recession Deepens," *The Wall Street Journal*, December 11, 2008, <http://online.wsj.com/article/SB122894049567595513.html#printMode>.

⁶ "The Budget and Economic Outlook: Fiscal Years 2009 to 2019," Congress of the United States Congressional Budget Office, January 2009, 1-2.

to date have been sufficient to put the system on a path to recovery.⁷

The major slowdown in economic activity and the policy responses to the turmoil in the housing and financial markets have significantly affected the federal budget. As a share of the economy, the deficit for this year is anticipated to be the largest recorded since World War II. (If the current recession were to continue beyond midyear 2009, it would last at least 19 months.) It could also be deepest recession during the postwar period. Under the rules governing CBO's budget projections—that is, an assumption that federal laws and policies regarding spending and taxation remain unchanged—the agency's baseline reflects these key points:

- ◆ CBO projects that the deficit this year will total \$1.2 trillion, or 8.3 percent of GDP. Enactment of an economic stimulus package would add to that deficit. In CBO's baseline, the deficit for 2010 falls to 4.9 percent of GDP, still high by historical standards.
- ◆ CBO expects federal revenues to decline by \$166 billion, or 6.6 percent, from the amount in 2008. The combination of the recession and sharp drops in the value of assets—most significantly in publicly traded stock—is expected to lead to sizable declines in receipts, especially from individual and corporate income taxes.⁸

Summary

The United States economy started 2009 on weaker footing as recession-shocked Americans retrenched further, forcing retailers to ring up fewer sales and factories to cut back production. The Federal Reserve's (Fed) new snapshot of business conditions nationwide, released January 14, 2009 in its Beige Book report, suggested the Country's economic picture had darkened over the last two months. The outlook appeared equally dim.⁹

The report, gathered from respondents in the 12 Federal Reserve districts through January 5, 2009, portrayed a gloomy economic scene, and suggested the Fed might need to implement further measures to thaw frozen credit market and restore lending.¹⁰

To help brace the economy, Fed Chairman Ben Bernanke and his colleagues signaled that

⁷ *Ibid*, 1.

⁸ *Ibid*.

⁹ Aversa, Jeannine. "Economy starts '09 on weaker footing; outlook dim, *BusinessWeek*, January 14, 2009, <http://www.busesseek.com/ap/financialnews/D95N4DJO0.htm>.

¹⁰ *Ibid*.

they would leave a key interest rate at record-low levels for some time. In an unprecedented move last month, the Fed ratcheted down its rate to hover between zero and 0.25 percent. The Fed pledged to use other unconventional tools to revive the economy.

The recession, which just entered its second year, already is the longest in a quarter-century and appeared likely to be the longest downturn since World War II. It is little wonder financial markets are taking a beating. Despite all of the talk of fiscal stimulus and the hope of a new administration (Barak Obama), one very large figure stands in the way of a real economic recovery. That number is \$2 trillion — the losses that investors and financial institutions are potentially sitting on from bad loans. The number keeps growing, according to the staff at the Wall Street Journal, and a sustained recovery for market was unlikely until the hole was filled.¹¹

The road to a United States economic recovery is likely to be a bumpy one. What happens further along the road depends on which fork the financial crisis takes us down. The heightened uncertainty—surrounding the economy and policy backdrop generates a wider range of possibilities than for most years. After a year of tumult, highlighted by the near collapse of the financial system in 2008, the worst recession in almost 30 years and the biggest stock market decline since 1937, many investment pros appear hesitant to declare with 100 percent certainty that stocks will finish the year in the plus column. There is no consensus among economists on the projected outlook for United States' 2009 economy. All economic reports reviewed indicate uncertainty for the future.

Natural Gas Pipeline Industry - 2009

Interstate pipelines have both utility and merchant energy characteristics. They are similar to monopoly utilities in that they require significant capital expenditures, involve a permitting process, and are subject to price controls. However, an interstate pipeline's service territory can be expanded through new permitting and construction, whereas that is not usually the case for LDCs. Pipelines are also subject to competition from other pipelines that are built close enough to contend for institutional customers.

Pipelines differ from LDCs in that their business generally relies on a limited number of large institutional customers (including wholesale marketers, exploration and production companies, LDCs, and large industrial companies). Such high customer concentration increases the risks associated with bad debt expense. When analyzing a pipeline company, the analyst should investigate demand and supply growth along the pipeline's footprint, opportunities for pipeline expansion, applications for competitive pipeline developments, and the growth

¹¹ WSJ Staff, "Banks' Loan Losses Could Reach \$2 Trillion," *The Wall Street Journal*, January 15, 2009, <http://blogs.wsj.com/economics/2009/01/15/banks-loan-losses-could-reach-2-trillion/>.

prospects and credit quality of shippers along the pipeline's system.¹²

Pipeline capacity utilization is affected by the location of natural gas supply sources and shifts in consumption patterns. A change in source requires new pipelines to transmit gas from growing production centers (such as the Rockies). The increased use of LNG imported via tankers also would affect the need for and utilization of pipeline assets.

The demand side of the equation is subject to potential secular shifts. For example, growth in the number of gas fired electric generating plants has had a major impact on geographical demand patterns. The appraiser/analyst must be aware of longer-term supply and demand trends that could increase or decrease the value of pipeline assets. Many pipeline companies historically have engaged in various unregulated merchant energy activities through subsidiary operations.

A number of pure-play pipeline businesses are owned by master limited partnerships (MLPs). MLPs trade on exchanges just like common stocks, but the businesses avoid income taxation by paying out nearly all free cash flows to shareholders. These income-oriented investments generally trade based on their yield, distribution growth potential, and volatility of cash flows. Because MLPs cannot use operating cash flows for growth-oriented capital expenditures, they depend on the ability to continuously raise fresh debt and equity capital to fund new investment. Unlike other pipeline companies, MLPs generally cannot be held by pension funds due to current tax obligations generated from their partnership structure.

Accordingly, shares of publicly traded MLPs generally are held by smaller retail investors. The general partners (GPs) for MLPs often have performance participation awards that provide the GPs with larger and larger interests in MLP distributions as the dividend is raised.¹³

Imports grow to meet near-term demand

US natural gas utilities have been relying increasingly on imported natural gas to meet growth in demand, a trend that is projected to gain importance in the years ahead. Since the early 1970s, when long-term growth in US natural gas production ended, imports — mostly from Canada, but also in the form of liquefied natural gas (LNG) from Africa and the Caribbean — have increased steadily, both in overall terms and as a percentage of US supply. Since 1973, net imports of natural gas have nearly quintupled in volume, growing by a cumulative average annual rate of about 4.5%. In 1973, net import volumes were 4.4% of domestic dry gas production; in 2007, imports accounted for about 19.7% of domestic dry gas production.

¹² Muir, Christopher B. "Natural Gas Distribution," *Standard & Poor's*, December 25, 2008, 33.

¹³ *Ibid.*

This trend is projected to continue in the near term: the Department of Energy estimated that net imported natural gas would represent about 20% of US gas supply by 2010. However, by 2030, the EIA projected that net imports would shrink to 16.3% of dry gas production. EIA expected natural gas consumption for power generation to remain flat in the near term and start declining around 2017, presumably in anticipation of new nuclear, coal, or renewable units coming on line in that time period. With flat demand projected for most other classes of consumers, total consumption through 2030 was not expected to change much.

While oil imports can easily be increased to accommodate rising demand, the same is not true for natural gas. Transportation is a major cost component of natural gas, whereas it is generally incidental to the cost of oil. As a result, the favored source of gas is domestic production.¹⁴

Short-Term Natural Gas Outlook

The January 13, 2009, Energy Information Administration Short-Term Energy Outlook (STEO) of the projection of natural gas needs for 2009 reported that total natural gas consumption was estimated to have increased by 0.7 percent in 2008 versus 6 percent in 2007, driven by a 5.8 percent increase in heating degree-days year-over-year. Natural gas consumption was projected to decline by 1.0 percent in 2009 and then increase by 0.7 percent in 2010. The demand outlook for 2009 was largely driven by expectations of continued economic weakness. The slight consumption growth projected in the residential sector is expected to be more than offset by consumption declines in the commercial, industrial, and electric power sectors in 2008. Consumption growth in 2010 was expected to be limited to the electric power sector, with all other sectors expected to decline slightly.¹⁵

Value Line (VL) reported in December 2008 that many of the natural gas (diversified) industry reported impressive results for the first nine months of 2008. This was due to high price realizations and growth in production. Strong performance in past quarters should have driven healthy growth in revenues and share earnings for the industry in 2008. However, at the end of 2008 and beginning of 2009 the landscape had changed markedly. A dramatic decline in natural gas prices had driven the share prices of many industry participants considerably lower. Given the lower gas quotations, performance at many natural gas companies in the coming quarters

¹⁴ *Ibid*, 11.

¹⁵ “Short-Term Energy Outlook,” Energy Information Administration, January 13, 2009, <http://www.eai.doe.gov/steo>.

could come under pressure.¹⁶

Additionally, *VL* reported that the Natural Gas (Diversified) Industry's Timeliness rank had fallen from 13 to 42 (out of 99) since their review in September of 2008. Looking forward, Napoli anticipated healthy share earnings growth for the industry over the pull to 2011-2013. Much depended upon the direction of natural gas prices, which *Value Line* projected would break out to the upside of their \$6-\$8 a unit equilibrium range.¹⁷

Gas Pipeline Transportation Risk Rating

IBISWorld Inc. annually produces an *IBISWorld Industry Risk Rating Report*. On January 17, 2009, the "Gas Pipeline Transportation of Natural Gas in the US: 48621" report was released. This industry group analyzed comprises establishments primarily engaged in the pipeline transportation of natural gas from processing plants to local distribution systems. The forecast period encompassed 2009. Three types of risk were recognized in their analysis. These were: risk arising from within the industry itself (structural risk), risks arising from the expected future performance of the industry (growth risk) and risk arising from forces external to the industry (external sensitivity risk). The results follow.¹⁸

Structural Risk Analysis — was forecasted to be medium-high over the outlook period. The primary risk factor was that the industry was in the decline phase of its economic life cycle. Over recent years, the Natural Gas Pipeline Industry has remained flat despite overall economic growth. Despite new pipelines set to come on stream in the next few years, the industry was still expected to expand more slowly than the economy as a whole. A medium level of revenue volatility existed in the industry and this reflected modest fluctuations in price. There was a medium level of competition within the industry, as the fixed nature of natural gas pipelines limited competition between firms in the industry. The industry received no government assistance and there were no specific tariffs.

Offsetting the high level of risk was the high level of barriers to industry entry which helps protect incumbent operators, thanks to the amount of capital required to fund construction of gas pipelines. Large initial contracts must also be secured in order to make the pipeline viable.

Growth Risk Analysis — was forecast to exhibit medium revenue risk in 2009. The demand for natural gas in the United States was expected to expand over the outlook period, and

¹⁶ Napoli, Michael F. "Natural Gas (Diversified) Industry," *Value Line Investment Survey*, December 12, 2008, 427.

¹⁷ *Ibid.*

¹⁸ "IBISWorld Industry Risk Rating Report, Gas Pipeline Transportation in the US: 48621," IBISWorld, January 17, 2000, 3.

new gas pipelines would be installed and pipeline expansions undertaken. Natural gas pipelines are long-lived assets and their construction was based on long-term projections of gas demand and supply. New supply sources and varying growth in gas demand in the different regions of the United States would also change the shape of the gas grid. At the same time, the growth in the availability of natural gas from Canada and the expansion in markets in the west and north east of the United States have spurred the construction of new pipelines linking those areas. *IBISWorld* forecasts that industry revenue will grow by 0.6% in 2009.¹⁹

IBISWorld gas pipeline transportation in the United State forecast growth analysis expects the industry revenue to increase at an average annual rate of about 1.4% in the five years to 2013. Although increases in gas consumption were anticipated, they were projected to be relatively modest, reflecting the adverse impact of high gas prices with the next couple of years. The increased use of natural gas for electric power generation, by gas-fired power stations, would continue to have an impact on the industry. New supply sources and varying growth in gas demand in different regions of the United States would also change the shape of the gas grid. For example, declining natural gas production in Kansas, Oklahoma and the Texas Panhandle has led to reduced usage of pipelines from those areas, a trend which was expected to continue.

Natural gas pipeline capacity was expected to expand strongly during the next five year period. New LNG import terminals in the United States and also in neighboring Canada and Mexico would require new gas pipeline laterals to transport vaporized LNG to existing interstate and intrastate natural gas pipeline systems. Another factor behind strong pipeline growth was the construction of new natural gas pipelines from northeast Texas and the Rocky Mountains, both of which are facing substantial growth in natural gas production.²⁰

Sensitivity Risk Analysis — for the year 2009 was forecasted to be low. Decent growth in downstream demand from gas distributors was expected to benefit the industry, while natural gas availability has slowly improved over the past few years. Interest rates were expected to remain low. This would normally be beneficial for the industry due to the large capital exposure of the industry; however, the credit crunch has made acquiring capital more difficult. Legislative compliance requirements were expected to remain moderately strict.

With the weak economic conditions that were projected to prevail in 2009, it appeared certain, according to *IBISWorld*, that demand for bonds will remain strong, particularly after the most recent market turmoil that included the government having to take control of Freddie Mac and Fannie Mae, the collapse of Lehman Brothers and the bailout of insurance giant AIG. Now that Treasury has been authorized to create a new body to purchase bad assets from financial

¹⁹ *Ibid*, 3-4.

²⁰ *Ibid*, 8.

companies, this may result in an increase in investor confidence, but yields are projected to remain relatively low nevertheless.

IBISWorld predicted that the average yield on 10-year bonds would fall by a further 90 basis points over 2009 to reach 2.8%. As the United States economy entered a period of more normal growth subsequent to this, bond yields are predicted to normalize over the remainder of 2009.²¹

When the three risk analyses were combined, the overall “Risk Rating Analysis” in the Pipeline Transportation of Natural Gas Industry is expected to be medium - low over the 2009 outlook period. The low level of risk can be attributed to continual expansion of new natural gas systems in the industry. Primary risk factors included *IBISWorld*’s forecast growth score this the gas pipeline transportation industry, reflecting expectations of stagnant revenue growth, and the level of legislative compliance requirements that the industry was subject to.

From the top of the medium risk band in 2006, risk declined to low in 2007 as downstream demand from natural gas distributors improved as a result revenue growth returned to positive growth after four years of contraction. In 2009, *IBISWorld* projects risk to increase to medium-low.

Natural Gas Outlook Summary

An article titled, “Pipelines to prosperity are elusive,” that was published in the *Houston Chronicle* the first of 2009 sums up best, in lay terms, what the gas pipeline transportation industry was facing. First lesson, there’s no safety in buried steel. Second lesson, investors have learned the first lesson the hard way, as shares of pipeline operators have plunged during 2008. As recently as the summer of 2008 some analysts and investment gurus were pitching pipelines as a way to protect against a decline in oil and natural gas prices. Instead companies such as Enterprise Products Partners and El Paso Corp. have struggled with falling share prices, tight credit markets and a shifting mix of shareholders that eroded their stock prices. Enterprise Products, for example, fell almost 35% in 2008, while Kinder Morgan Energy Partners dropped 15% and El Paso Plunged 55%. In fact, the declining shares led to El Paso’s removal from the *Standard & Poor*’s 100 index.

Enterprise’s president, Michael Creel, admitted being a little baffled. His company, which is structured as a master limited partnership, should be attractive to investors because of the tax advantages for the partnership structure. Pipelines typically are less affected by commodity prices, because they operate more like toll roads, making money from fees for oil and gas moving through their networks. But 2008’s price decline was accompanied by a drop in demand that eroded transportation fees.

²¹ *Ibid*, 10.

Tightening credit markets and weaker commodity prices also hampered expansion efforts, another example of how the turmoil in the credit markets is hurting companies. The cost of debt has escalated. Enterprise scaled back its capital spending and in September 2008 scrapped plans to build a 673-mile pipeline from Colorado to North Dakota because of rising financing costs, according to a filing with the Securities and Exchange Commission.

Despite the financing struggles, pipeline operators were among the few companies that were able to sell high-risk debt the last quarter of 2008, because the cash flow from their networks offset their credit risk. The return of retail investors, for whom partnerships such as Enterprise and Kinder Morgan were designed, may help stabilize share prices in 2009. So far investors remained wary. After all, they've been slammed by the equity markets, squeezed by tight credit and hammered by falling commodities. In these markets, no haven seems safe according to Loren Steffy.²²

Trends in energy supply and demand were affected by difficult-to-predict factors: energy prices, United States and worldwide economic growth or decline, advances in technologies, and future public policy decisions in the United States and in other countries. The projection for United States economic growth, a key determinant of United States demand, has been lowered. All of the political and economic factors discussed in this section would affect the typical investor's cost of capital as the elements of business risk increases. The additional risk attributable to the natural gas pipeline industry should be reflected in the development of the cost of capital.

²² Steffy, Loren. "Pipelines to prosperity are elusive," *Houston Chronicle*, January 3, 2009, <http://www.chron.com/fdcp?1232992316520>.

Weighted Average Cost of Capital (WACC)

The return investors require on investments of comparable risk is what the cost of capital measures. Rational investors will not invest in a particular investment opportunity if the expected return on that opportunity is less than their cost of capital requirement. The weighted average cost of capital (WACC) is also known in the appraisal and financial community as the opportunity cost of capital. The WACC is used primarily for making long-term capital investment decisions by investors and purchasers. Accordingly, the WACC is used by appraisers to estimate *market value*.²³ To calculate market value, the appraiser discounts expected future income (cash flow) by the rate of return offered by comparable investment alternatives. [All of the annual “income” figures used in appraising income-producing properties are *cash flows* rather than accrual accounting incomes.²⁴] This rate of return is often referred to as the discount rate or the opportunity cost of capital.²⁵ The Appraisal Institute has defined opportunity cost as quoted below:

*Opportunity cost is the net cost of opportunities not chosen or options foregone, denied or lost. An investor who selects one investment forgoes the opportunity to invest in other available investments...Opportunity cost is related to the principle of substitution, and is particularly significant in estimating the rates of return necessary to attract capital. By analyzing and comparing the prospective rates of return offered by alternative investment opportunities, an appraiser can estimate the required rate of return for the property being appraised.*²⁶

The estimated cost of capital in this report for the Interstate Natural Gas Pipeline Industry as of January 1, 2009 is based on the generally accepted appraisal methodology known as the band of investment technique. The band of investment technique consists of the following steps:

²³ Market value is defined by the Appraisal Institute as, “The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress.” See *The Appraisal of Real Estate*, 13th ed., (Chicago: Appraisal Institute, 2008), 23.

²⁴ William N. Kinnard, Jr., *Income Property Valuation*, (Lexington: Heath Lexington Books, 1982), 70.

²⁵ Richard A. Brealey and Stewart C. Meyers, *Principles of Corporate Finance*, 4th ed., (New York: McGraw-Hill, 1991), 13.

²⁶ *The Appraisal of Real Estate*, 11th ed., (Chicago: Appraisal Institute, 1996), 44.

1. Analyze and determine the appropriate capital structure.
2. Identify the appropriate cost for each financing band of the capital structure.
3. Weight the appropriate cost for each financing band by the relative proportion of the capital structure represented by each financing band.

The sum of the weighted costs for the financing bands represents the weighted average cost of capital. This weighted cost of capital is typically known as the discount rate in appraisal literature and the algebraic formula is shown in Figure 1.

In explaining the estimation of the cost of capital, Ibbotson Associates states:

$$K = (D \times K_d) + (E \times K_e)$$

where

K = Weighted Average Cost of Capital

D = Proportion of Debt in Capital Structure

K_d = Cost of Debt

E = Proportion of Equity in Capital Structure

K_e = Cost of Equity

Figure 1

The cost of capital is always an expectational or forward-looking concept. While the past performance of an investment and other historical information can be good guides and are often used to estimate the required rate of return on capital, the expectations of future events are the only factors that actually determine the cost of capital. An investor contributes capital to a firm with the expectation that the business' future performance will provide a fair return on the investment. If past performance were the criterion most important to investors, no one would invest in start-up ventures. It should also be noted that the cost of capital is a function of the investment, not the investor.²⁷

Cost of Capital Study Results

The cost of capital for the Interstate Natural Gas Pipeline Industry as of January 1, 2009 is estimated to be 10.94% (rounded to **10.95%**) as the chart on the following page indicates. Following the chart are explanations of the derivation of each of the component parts of the cost of capital study.

²⁷ *SBBI (Stocks, Bonds, Bills and Inflation)*, 2008 Yearbook: Valuation Edition, (Chicago: Morningstar, Inc., 2008), 23.

Capital	Portion	Cost	Product
Debt	40.00%	8.55%	3.42%
Equity	60.00%	12.53%	7.52%
Totals	100.00%		10.94%

Capital Structure

Economists and appraisers measure a firm's capital structure in terms of the market values of its debt and equity because that is the best measure of the amounts of debt and equity that investors have invested in the company on a going-forward basis. Furthermore, economists and appraisers generally agree that the goal of management is to maximize the value of the firm, where the value of the firm is the sum of the market value of the firm's debt and equity. Only by measuring a firm's capital structure in terms of market values can its managers choose a financing strategy that maximizes the value of the firm.

For estimating the cost of capital for the INGPI, it is appropriate to use the typical market capital structure for similar interstate natural gas pipeline companies. There is very little debate about this concept, however for clarity we note the following statements from Brigham and Gapenski and from Damodaran.

We are absolutely convinced that the procedures we recommend are correct — namely, firms should focus on market value capital structures and base their cost of capital calculations on market value weights. Because market values do change, it would be impossible to keep the actual capital structure on target at all times, but this fact in no way detracts from the validity of market value targets.²⁸

The weights assigned to equity and debt in calculating the weighted average cost of capital have to be based upon market value, not book value. The rationale rests on the fact that the cost of capital measures the cost of issuing securities, stocks as well as bonds, to finance projects, and that these securities are issued at market value, not at book value.²⁹

In the appraisal process or in developing the cost of capital to be used in the appraisal process the appraiser must utilize the market capital structure for all types of appraisal. Even

²⁸ Eugene F. Brigham and Louis C. Gapenski, *Financial Management*, 7th ed. (New York: The Dryden Press, 1994), 599.

²⁹ Damodaran, Aswath, *Investment Valuation*, (New York, NY: John Wiley & Sons, Inc., 1996), p. 64.

when public utilities are strictly regulated, it is necessary for the appraiser to use the market capital structure unless the book capital structure is found to be the same as the market capital structure. In the past often the book capital structure was quite similar to the market capital structure, however that is not the case today. Today the market capital structure varies significantly from the book capital structure for most interstate natural gas pipelines. Thus, investors are concerned with the capital structure they will use to finance the purchase of an interstate natural gas pipeline and that will always be the typical market capital structure.

It is also important to note what elements of capital comprise the makeup of the **capital structure** from an appraisal standpoint. The capital structure consists only of long-term debt, common stock, and where appropriate, preferred stock. The capital structure should not be confused with *financial structure* or any other term used in financial literature. To understand what elements comprise the capital structure it is important to define capital structure and financial structure, which are defined as follows:

CAPITAL STRUCTURE corporation's financial framework, including LONG-TERM DEBT, PREFERRED STOCK, and NET WORTH. It is distinguished from FINANCIAL STRUCTURE, which includes additional sources of capital such as short-term debt, accounts payable, and other liabilities.³⁰

FINANCIAL STRUCTURE makeup of the right-hand side of a company's BALANCE SHEET, which includes all the ways its assets are financed, such as trade accounts payable and short-term borrowings as well as long-term debt and ownership equity. Financial structure is distinguished from CAPITAL STRUCTURE, which includes only long-term debt and equity.³¹

It is also important to note that neither accumulated depreciation or accumulated deferred income taxes are included in capital structure. Some appraisers have mistakenly included accumulated deferred income taxes in constructing a firm's capital structure. This is simply wrong for estimating the cost of capital and for appraisal purposes. The following quotation from *Financial Management* addresses this issue quite well:

Since depreciation-generated funds have the same cost as the firm's WACC when retained earnings are used for the equity component, it is not necessary to consider them when estimating the WACC...Therefore, deferred taxes, like depreciation, have a cost equal to the firm's WACC using retained earnings as the equity

³⁰ John Downes and Jordan Elliot Goodman, *Dictionary of Finance and Investment Terms*, (New York: Barron's, 1985), 54.

³¹ *Ibid.*, 132.

component. Indeed, deferred taxes arise solely because a firm records a different depreciation expense on its tax books than on the books used to report income to shareholders... Deferred taxes are treated the same way as depreciation cash flows: they are not included when estimating the firm's WACC...³²

The appropriate capital structure for use in estimating the INGPI's cost of capital is the expected capital structure that a typical purchaser would likely use to finance the purchase of the operating assets of a company within this industry. This typical purchaser would take into account the regulatory agency's allowed rate of return in analyzing the risk profile and selecting the market capital structure. Thus, an analysis of the typical market capital structure used in the interstate natural gas pipeline industry is appropriate.

The market capital structure developed for the INGPI was calculated from information obtained from *Value Line Investment Survey* data base (*Value Line*) and *Standard & Poor's Compustat* data base as of January 2009. The capital structure study involved the following companies we believe to be representative of the interstate natural gas transmission pipeline industry: 28 companies classified by *Value Line* as the Natural Gas (Diversified) Industry (from the *Value Line* full data base), using both *Value Line* and S&P data; 17 companies that make up the *Value Line* Oil/Gas Distribution group; 31 large companies from the combined group that have reported annual sales of at least \$750 million; and twelve (12) companies heavily involved with natural gas pipelines from the interstate natural gas pipeline forum group, which have traded common stock listed by *Standard and Poor's*. Additionally, we considered the 44 companies from the *S&P 500* which have **BBB-** rated long-term debt (the same rating as the typical interstate natural gas pipeline company). Ultimately, to retain a particular rating status by the major rating agencies, companies must maintain a certain level of equity and the ability to pay their long-term debt obligations. Thus, it is important to consider the capital structures of companies with similar ratings in estimating the appropriate capital structure.

The results indicate that the market capital structure for the industry is approximately 40% debt, essentially no preferred stock, and 60% equity. For each of the above mentioned groups of companies, we calculated the simple average and median capital structure for each grouping using data reported both by *Value Line* and *Standard & Poor's*. As many traditional interstate natural gas pipelines have become subsidiaries of other pipelines and other energy companies, there are now less members of the interstate natural gas pipeline forum group, which have traded common stock. Thus, we are inclined to give a little less consideration to the data from the forum group.

For purposes of analysis we used the market capital structure for each company. The

³² Eugene F. Brigham and Louis C. Gapenski, *Financial Management*, 7th ed. (New York: The Dryden Press, 1994), 368-369.

market value of the common equity portion of the capital structure was determined by multiplying the number of shares outstanding times the recent price reported by *Value Line* and/or *Standard & Poor's*. As surrogates for the market value of debt and preferred stock we substituted the book value of each. The market values of both debt and equity are always preferred, if available. Since the book value of debt is usually close to market value, book value is usually used for the debt weight. Ibbotson states, "Therefore, in most cases the market value of debt in the capital structure is assumed to be the book value of debt."³³ Only a few companies in this industry have issued preferred stock and, like debt, we used book value as a surrogate for the market value of preferred stock. Our recent analysis indicates that book values for long-term debt and preferred stock are fairly reasonable approximations for market value at the present time, thus book value can be substituted as a reasonable proxy for the market value of debt and preferred stock capital.

The capital structure calculations can be found on the following ten pages. As can be observed from the capital structure calculations using the natural gas transmission pipeline industry groupings described above, the indicators point to an approximate market capital structure of 40% debt (**D**) and 60% equity (**E**). (*Preferred stock was judged not to be of significant importance in the financing of companies in the overall interstate natural gas pipeline industry.*) We gave the most consideration to the median indicators (median figures being less influenced by extremes than averages) from the data groups made up of the *Value Line* Natural Gas Diversified Industry (All), *Value Line* Oil/Gas Distribution Industry (All), the 31 large³⁴ companies from the combining of the first two groups, and the 44 companies from the **S&P** 500 with long-term debt ratings of BBB-.

On the following pages are the capital structure data from *Value Line* and *Standard & Poor's Compustat*.

³³ *SBBI (Stocks, Bonds, Bills and Inflation), 2008 Yearbook: Valuation Edition*, (Chicago: Morningstar, Inc., 2008) p. 14.

³⁴ Large pipeline group made up of companies with annual sales of over \$750 million.

Value Line Natural Gas Diversified Industry (All)
Capital Structure (VL Data) - January 1, 2009

Company Name	Ticker	LTD %	PS %	CS %
ATP Oil & Gas Corp	ATPG	86.13%	0.00%	13.87%
Cabot Oil & Gas 'A'	COG	20.17%	0.00%	79.83%
Callon Pete Co	CPE	80.46%	0.00%	19.54%
Chesapeake Energy	CHK	55.25%	1.94%	42.81%
Crosstex Energy	XTXI	84.99%	0.00%	15.01%
Crosstex Energy LP	XTEX	81.51%	0.00%	18.49%
Delta Natural Gas	DGAS	40.89%	0.00%	59.11%
Devon Energy	DVN	13.43%	0.00%	86.57%
Dynegy Inc. 'A'	DYN	74.14%	0.00%	25.86%
EOG Resources	EOG	9.53%	0.00%	90.47%
Eagle Rock Energy Partners Ltd	EROC	61.89%	0.00%	38.11%
El Paso Corp.	EP	63.11%	3.86%	33.03%
Energen Corp.	EGN	19.28%	0.00%	80.72%
Enterprise Products	EPD	44.96%	0.00%	55.04%
Equitable Resources	EQT	20.85%	0.00%	79.15%
MDU Resources	MDU	25.41%	0.27%	74.32%
Markwest Energy Partners LP	MWE	60.28%	0.00%	39.72%
National Fuel Gas	NFG	27.16%	0.00%	72.84%
Newfield Exploration	NFX	39.28%	0.00%	60.72%
ONEOK Inc.	OKE	55.79%	0.00%	44.21%
ONEOK Partners LP	OKS	35.52%	0.00%	64.48%
Penn Virginia Corp.	PVA	42.94%	0.00%	57.06%
Petroleum Development Corp.	PETD	44.32%	0.00%	55.68%
Quest Resource Corp	QRCP	95.04%	0.00%	4.96%
Questar Corp.	STR	23.79%	0.00%	76.21%
Quicksilver Res.	KWK	66.04%	0.00%	33.96%
Southwestern Energy	SWN	5.47%	0.00%	94.53%
XTO Energy	XTO	31.96%	0.00%	68.04%
Average		46.77%	0.22%	53.01%
Median		43.63%	0.00%	56.37%

Source: *Value Line* CD Rom, January 2009.

Value Line Oil/Gas Distribution Industry (All)
Capital Structure (VL Data) - January 1, 2009

Company Name	Ticker	LTD %	PS %	CS %
Adino Energy Corp	ADNY	41.24%	0.00%	58.76%
Boardwalk Pipeline	BWP	41.45%	0.00%	58.55%
Buckeye Partners L.P.	BPL	43.47%	0.00%	56.53%
Clean Energy Fuels	CLNE	5.43%	0.00%	94.57%
El Paso Pipeline Partners L.P.	EPB	28.28%	0.00%	71.72%
Enbridge Energy Partners LLP	EEP	53.09%	0.00%	46.91%
Enbridge Inc.	ENB.TO			
Energy Transfer	ETP	48.98%	0.00%	51.02%
Kinder Morgan Energy	KMP	39.24%	0.00%	60.76%
Magellan Midstream	MMP	30.81%	0.00%	69.19%
Plains All Amer. Pipe.	PAA	40.18%	0.00%	59.82%
Rio Vista Energy Partners L.P.	RVEP	74.48%	0.00%	25.52%
Southern Union	SUG	62.73%	2.31%	34.96%
Spectra Energy	SE	47.06%	0.00%	52.94%
Suburban Propane	SPH	30.45%	0.00%	69.55%
TEPPCO Partners L.P.	TPP	49.33%	0.00%	50.67%
Williams Cos.	WMB	45.61%	0.00%	54.39%
	Average	42.61%	0.14%	57.24%
	Median	42.46%	0.00%	57.54%

Source: *Value Line* CD Rom, January 2009.

**VL Natural Gas Diversified & Oil/Gas Distribution - Large
Capital Structure (VL Data) - January 1, 2009**

Company Name	Ticker	LTD %	PS %	CS %
Chesapeake Energy	CHK	55.25%	1.94%	42.81%
Crosstex Energy	XTXI	84.99%	0.00%	15.01%
Crosstex Energy LP	XTEX	81.51%	0.00%	18.49%
Devon Energy	DVN	13.43%	0.00%	86.57%
Dynegy Inc. 'A'	DYN	74.14%	0.00%	25.86%
EOG Resources	EOG	9.53%	0.00%	90.47%
Eagle Rock Energy Partners Ltd	EROC	61.89%	0.00%	38.11%
El Paso Corp.	EP	63.11%	3.86%	33.03%
Enbridge Energy Partners LLP	EEP	53.09%	0.00%	46.91%
Enbridge Inc.	ENB.TO			
Energen Corp.	EGN	19.28%	0.00%	80.72%
Energy Transfer	ETP	48.98%	0.00%	51.02%
Enterprise Products	EPD	44.96%	0.00%	55.04%
Equitable Resources	EQT	20.85%	0.00%	79.15%
Kinder Morgan Energy	KMP	39.24%	0.00%	60.76%
MDU Resources	MDU	25.41%	0.27%	74.32%
Magellan Midstream	MMP	30.81%	0.00%	69.19%
National Fuel Gas	NFG	27.16%	0.00%	72.84%
Newfield Exploration	NFX	39.28%	0.00%	60.72%
ONEOK Inc.	OKE	55.79%	0.00%	44.21%
ONEOK Partners LP	OKS	35.52%	0.00%	64.48%
Penn Virginia Corp.	PVA	42.94%	0.00%	57.06%
Plains All Amer. Pipe.	PAA	40.18%	0.00%	59.82%
Questar Corp.	STR	23.79%	0.00%	76.21%
Southern Union	SUG	62.73%	2.31%	34.96%
Southwestern Energy	SWN	5.47%	0.00%	94.53%
Spectra Energy	SE	47.06%	0.00%	52.94%
Suburban Propane	SPH	30.45%	0.00%	69.55%
TEPPCO Partners L.P.	TPP	49.33%	0.00%	50.67%
Williams Cos.	WMB	45.61%	0.00%	54.39%
XTO Energy	XTO	31.96%	0.00%	68.04%
Average		42.12%	0.28%	57.60%
Median		41.56%	0.00%	58.44%

Source: *Value Line* CD Rom, January 2009.

Interstate Natural Gas Pipeline Forum (Pipelines)
Capital Structure (VL Data) - January 1, 2009

Company Name	Ticker	LTD %	PS %	CS %
Boardwalk Pipeline	BWP	41.45%	0.00%	58.55%
CenterPoint Energy	CNP	68.41%	0.00%	31.59%
El Paso Corp.	EP	63.11%	3.86%	33.03%
Kinder Morgan Energy	KMP	39.24%	0.00%	60.76%
MDU Resources	MDU	25.41%	0.27%	74.32%
National Fuel Gas	NFG	27.16%	0.00%	72.84%
ONEOK Partners LP	OKS	35.52%	0.00%	64.48%
Questar Corp.	STR	23.79%	0.00%	76.21%
Southern Union	SUG	62.73%	2.31%	34.96%
Spectra Energy	SE	47.06%	0.00%	52.94%
TransCanada Corp.	TRP			
Williams Cos.	WMB	45.61%	0.00%	54.39%
Average		43.59%	0.59%	55.83%
Median		41.45%	0.00%	58.55%

Source: *Value Line* CD Rom, January 2009.

Value Line Natural Gas Diversified Industry (All)
Capital Structure (S&P Data) - January 1, 2009

Company Name	Ticker	LTD %	PS %	CS %
ATP OIL & GAS CORP	ATPG	88.39%	0.00%	11.61%
CABOT OIL & GAS CORP	COG	22.94%	0.00%	77.06%
CALLON PETROLEUM CO/DE	CPE	82.89%	0.00%	17.11%
CHESAPEAKE ENERGY CORP	CHK	59.16%	2.08%	38.76%
CROSSTEX ENERGY INC	XTXI	88.16%	0.00%	11.84%
CROSSTEX ENERGY LP	XTEX	87.27%	0.00%	12.73%
DELTA NATURAL GAS CO INC	DGAS	42.12%	0.00%	57.88%
DEVON ENERGY CORP	DVN	14.29%	0.00%	85.71%
DYNEGY INC	DYN	78.25%	0.00%	21.75%
EAGLE ROCK ENERGY PARTNRS LP	EROC	70.35%	0.00%	29.65%
EL PASO CORP	EP	66.35%	4.06%	29.59%
ENERGEN CORP	EGN	21.13%	0.00%	78.87%
ENTERPRISE PRODS PRTNER -LP	EPD	48.24%	0.00%	51.76%
EOG RESOURCES INC	EOG	10.07%	0.00%	89.93%
EQUITABLE RESOURCES INC	EQT	22.22%	0.00%	77.78%
MARKWEST ENERGY PARTNERS LP	MWE	68.61%	0.00%	31.39%
MDU RESOURCES GROUP INC	MDU	26.33%	0.28%	73.40%
NATIONAL FUEL GAS CO	NFG	28.72%	0.00%	71.28%
NEWFIELD EXPLORATION CO	NFX	42.57%	0.00%	57.43%
ONEOK INC	OKE	57.42%	0.00%	42.58%
ONEOK PARTNERS -LP	OKS	38.51%	0.00%	61.49%
PENN VIRGINIA CORP	PVA	47.14%	0.00%	52.86%
PETROLEUM DEVELOPMENT CORP	PETD	47.39%	0.00%	52.61%
QUEST RESOURCE CORP	QRCP	96.73%	0.00%	3.27%
QUESTAR CORP	STR	26.04%	0.00%	73.96%
QUICKSILVER RESOURCES INC	KWK	72.44%	0.00%	27.56%
SOUTHWESTERN ENERGY CO	SWN	6.36%	0.00%	93.64%
XTO ENERGY INC	XTO	35.35%	0.00%	64.65%
Average		49.84%	0.23%	49.93%
Median		47.27%	0.00%	52.74%

Source: S&P Compustat, January 2009.

Value Line Oil/Gas Distribution Industry (All)
Capital Structure (S&P Data) - January 1, 2009

Company Name	Ticker	LTD %	PS %	CS %
ADINO ENERGY CORP	3ADNY	44.09%	0.00%	55.91%
BOARDWALK PIPELINE PARTNERS	BWP	45.78%	0.00%	54.22%
BUCKEYE PARTNERS LP	BPL	47.29%	0.00%	52.71%
CLEAN ENERGY FUELS CORP	CLNE	6.43%	0.00%	93.57%
EL PASO PIPELINE PARTNERS LP	EPB	30.68%	0.00%	69.32%
ENBRIDGE ENERGY PRTNRS -LP	EEP	57.04%	0.00%	42.96%
ENBRIDGE INC	ENB	42.29%	0.56%	57.15%
ENERGY TRANSFER PARTNERS -LP	ETP	53.12%	0.00%	46.88%
KINDER MORGAN ENERGY -LP	KMP	40.31%	0.00%	59.69%
MAGELLAN MIDSTREAM PRTNRS LP	MMP	33.54%	0.00%	66.46%
PLAINS ALL AMER PIPELNE -LP	PAA	43.03%	0.00%	56.97%
RIO VISTA ENERGY PARTNERS LP	RVEP	85.37%	0.00%	14.63%
SOUTHERN UNION CO	SUG	65.21%	2.40%	32.39%
SPECTRA ENERGY CORP	SE	49.35%	0.00%	50.65%
SUBURBAN PROPANE PRTNRS -LP	SPH	31.43%	0.00%	68.57%
TEPPCO PARTNERS -LP	TPP	53.38%	0.00%	46.62%
WILLIAMS COS INC	WMB	48.33%	0.00%	51.67%
Average		45.69%	0.17%	54.14%
Median		45.78%	0.00%	54.22%

Source: *S&P Compustat*, January 2009.

**VL Natural Gas Diversified & Oil/Gas Distribution - Large
Capital Structure (S&P Data) - January 1, 2009**

Company Name	Ticker	LTD %	PS %	CS %
CHESAPEAKE ENERGY CORP	CHK	59.16%	2.08%	38.76%
CROSSTEX ENERGY INC	XTXI	88.16%	0.00%	11.84%
CROSSTEX ENERGY LP	XTEX	87.27%	0.00%	12.73%
DEVON ENERGY CORP	DVN	14.29%	0.00%	85.71%
DYNEGY INC	DYN	78.25%	0.00%	21.75%
EAGLE ROCK ENERGY PARTNRS LP	EROC	70.35%	0.00%	29.65%
EL PASO CORP	EP	66.35%	4.06%	29.59%
ENBRIDGE ENERGY PRTNRS -LP	EEP	57.04%	0.00%	42.96%
ENBRIDGE INC	ENB	42.29%	0.56%	57.15%
ENERGEN CORP	EGN	21.13%	0.00%	78.87%
ENERGY TRANSFER PARTNERS -LP	ETP	53.12%	0.00%	46.88%
ENTERPRISE PRODS PRTNER -LP	EPD	48.24%	0.00%	51.76%
EOG RESOURCES INC	EOG	10.07%	0.00%	89.93%
EQUITABLE RESOURCES INC	EQT	22.22%	0.00%	77.78%
KINDER MORGAN ENERGY -LP	KMP	40.31%	0.00%	59.69%
MAGELLAN MIDSTREAM PRTNRS LP	MMP	33.54%	0.00%	66.46%
MDU RESOURCES GROUP INC	MDU	26.33%	0.28%	73.40%
NATIONAL FUEL GAS CO	NFG	28.72%	0.00%	71.28%
NEWFIELD EXPLORATION CO	NFX	42.57%	0.00%	57.43%
ONEOK INC	OKE	57.42%	0.00%	42.58%
ONEOK PARTNERS -LP	OKS	38.51%	0.00%	61.49%
PENN VIRGINIA CORP	PVA	47.14%	0.00%	52.86%
PLAINS ALL AMER PIPELNE -LP	PAA	43.03%	0.00%	56.97%
QUESTAR CORP	STR	26.04%	0.00%	73.96%
SOUTHERN UNION CO	SUG	65.21%	2.40%	32.39%
SOUTHWESTERN ENERGY CO	SWN	6.36%	0.00%	93.64%
SPECTRA ENERGY CORP	SE	49.35%	0.00%	50.65%
SUBURBAN PROPANE PRTNRS -LP	SPH	31.43%	0.00%	68.57%
TEPPCO PARTNERS -LP	TPP	53.38%	0.00%	46.62%
WILLIAMS COS INC	WMB	48.33%	0.00%	51.67%
XTO ENERGY INC	XTO	35.35%	0.00%	64.65%
Average		44.87%	0.30%	54.83%
Median		43.03%	0.00%	56.97%

Source: S&P Compustat, January 2009.

Interstate Natural Gas Pipeline Forum (Pipelines)
Capital Structure (S&P Data) - January 1, 2009

Company Name	Ticker	LTD %	PS %	CS %
BOARDWALK PIPELINE PARTNERS	BWP	45.78%	0.00%	54.22%
CENTERPOINT ENERGY INC	CNP	69.36%	0.00%	30.64%
EL PASO CORP	EP	66.35%	4.06%	29.59%
KINDER MORGAN ENERGY -LP	KMP	40.31%	0.00%	59.69%
MDU RESOURCES GROUP INC	MDU	26.33%	0.28%	73.40%
NATIONAL FUEL GAS CO	NFG	28.72%	0.00%	71.28%
ONEOK PARTNERS -LP	OKS	38.51%	0.00%	61.49%
QUESTAR CORP	STR	26.04%	0.00%	73.96%
SOUTHERN UNION CO	SUG	65.21%	2.40%	32.39%
SPECTRA ENERGY CORP	SE	49.35%	0.00%	50.65%
TRANSCANADA CORP	TRP	48.78%	1.17%	50.05%
WILLIAMS COS INC	WMB	48.33%	0.00%	51.67%
Average		46.09%	0.66%	53.25%
Median		47.06%	0.00%	52.95%

Source: *S&P Compustat*, January 2009.

All Companies in S&P 500 with "BBB-" Rated Debt
Capital Structure (VL Data) - January 1, 2009

Company Name	Ticker	LTD %	PS %	CS %
Agilent Technologies	A	8.90%	0.00%	91.10%
Allegheny Energy	AYE	39.31%	0.00%	60.69%
Allegheny Techn.	ATI	14.85%	0.00%	85.15%
Ameren Corp.	AEE	46.84%	0.00%	53.16%
Amphenol Corp.	APH	14.46%	0.00%	85.54%
Anadarko Petroleum	APC	35.88%	0.00%	64.12%
Best Buy Co.	BBY	8.15%	0.00%	91.85%
Big Lots Inc.	BIG	0.00%	0.00%	100.00%
CMS Energy Corp.	CMS	69.27%	2.80%	27.93%
CSX Corp.	CSX	33.85%	0.00%	66.15%
CenturyTel Inc.	CTL	53.64%	0.00%	46.36%
Coventry Health Care	CVH	40.28%	0.00%	59.72%
Developers Div. R'lty	DDR			
Discover Fin'l Svcs.	DFS	28.45%	0.00%	71.55%
Dr Pepper Snapple	DPS			
Edison Int'l	EIX	50.86%	0.00%	49.14%
Embarq Corp.	EQ	52.27%	0.00%	47.73%
Freep't-McMoRan C&G	FCX	32.27%	17.85%	49.88%
Gannett Co.	GCI	65.56%	0.00%	34.44%
Hess Corp.	HES	16.26%	0.00%	83.74%
Janus Capital Group	JNS	43.93%	0.00%	56.07%
Kroger Co.	KR	28.78%	0.00%	71.22%
L-3 Communic.	LLL	32.38%	0.00%	67.62%
Life Technologies	LIFE	33.23%	0.00%	66.77%
Macy's Inc.	M	64.22%	0.00%	35.78%
Marsh & McLennan	MMC	19.92%	0.00%	80.08%
Mattel Inc.	MAT	11.40%	0.00%	88.60%
Nasdaq OMX Group	NDAQ	30.61%	0.00%	69.39%
National Semic.	NSM	35.51%	0.00%	64.49%
NiSource Inc.	NI	67.15%	0.00%	32.85%
Noble Energy	NBL	17.58%	0.00%	82.42%
Penney (J.C.)	JCP	42.01%	0.00%	57.99%
Pinnacle West Capital	PNW	47.33%	0.00%	52.67%
Plum Creek Timber	PCL	28.88%	0.00%	71.12%
Prologis	PLD			
SLM Corporation	SLM	96.02%	1.05%	2.93%
Sealed Air	SEE	35.96%	0.00%	64.04%
TECO Energy	TE	53.95%	0.00%	46.05%
Unum Group	UNM	24.86%	0.00%	75.14%
Watson Pharmac.	WPI	23.87%	0.00%	76.13%
Williams Cos.	WMB	45.61%	0.00%	54.39%
Wyndham Worlwide	WYN	69.33%	0.00%	30.67%
Xilinx Inc.	XLNX	16.54%	0.00%	83.46%
Yum! Brands	YUM	19.02%	0.00%	80.98%
Average		36.57%	0.53%	62.90%
Median		33.85%	0.00%	64.49%

Source: Value Line CD Rom, January 2009.

All Companies in S&P 500 with "BBB-" Rated Debt
Capital Structure (S&P Data) - January 1, 2009

Company Name	Ticker	LTD %	PS %	CS %
AGILENT TECHNOLOGIES INC	A	27.98%	0.00%	72.02%
ALLEGHENY ENERGY INC	AYE	40.66%	0.00%	59.34%
ALLEGHENY TECHNOLOGIES INC	ATI	16.62%	0.00%	83.38%
AMEREN CORP	AEE	46.01%	1.46%	52.53%
AMPHENOL CORP	APH	15.45%	0.00%	84.55%
ANADARKO PETROLEUM CORP	APC	38.31%	0.00%	61.69%
BEST BUY CO INC	BBY	8.83%	0.00%	91.17%
BIG LOTS INC	BIG	0.00%	0.00%	100.00%
CENTURYTEL INC	CTL	54.66%	0.00%	45.33%
CMS ENERGY CORP	CMS	70.31%	3.37%	26.31%
COVENTRY HEALTH CARE INC	CVH	39.92%	0.00%	60.08%
CSX CORP	CSX	36.51%	0.00%	63.49%
DEVELOPERS DIVERSIFIED RLTY	DDR	83.81%	7.87%	8.32%
DISCOVER FINANCIAL SVCS INC	DFS	28.84%	0.00%	71.16%
DR PEPPER SNAPPLE GROUP INC	DPS	46.53%	0.00%	53.47%
EDISON INTERNATIONAL	EIX	48.06%	4.14%	47.80%
EMBARQ CORP	EQ	53.33%	0.00%	46.67%
FREEPORT-MCMORAN COP&GOLD	FCX	35.23%	19.49%	45.29%
GANNETT CO	GCI	68.17%	0.00%	31.83%
HESS CORP	HES	18.21%	0.00%	81.79%
JANUS CAPITAL GROUP INC	JNS	46.59%	0.00%	53.41%
KROGER CO	KR	28.72%	0.00%	71.28%
L-3 COMMUNICATIONS HLDGS INC	LLL	35.92%	0.00%	64.08%
LIFE TECHNOLOGIES CORP	LIFE	34.83%	0.00%	65.17%
MACY'S INC	M	66.77%	0.00%	33.23%
MARSH & MCLENNAN COS	MMC	20.41%	0.00%	79.59%
MATTEL INC	MAT	11.69%	0.00%	88.31%
NASDAQ OMX GROUP INC	NDAQ	32.21%	0.00%	67.79%
NATIONAL SEMICONDUCTOR CORP	NSM	37.46%	0.00%	62.54%
NISOURCE INC	NI	67.76%	0.00%	32.24%
NOBLE ENERGY INC	NBL	19.41%	0.00%	80.59%
PENNEY (J C) CO	JCP	44.48%	0.00%	55.52%
PINNACLE WEST CAPITAL CORP	PNW	48.48%	0.00%	51.52%
PLUM CREEK TIMBER CO INC	PCL	27.86%	0.00%	72.14%
PROLOGIS	PLD	73.51%	2.32%	24.17%
SEALED AIR CORP	SEE	36.82%	0.00%	63.18%
SLM CORP	SLM	95.26%	1.38%	3.36%
TECO ENERGY INC	TE	54.96%	0.00%	45.04%
UNUM GROUP	UNM	26.95%	0.00%	73.05%
WATSON PHARMACEUTICALS INC	WPI	22.88%	0.00%	77.12%
WILLIAMS COS INC	WMB	48.33%	0.00%	51.67%
WYNDHAM WORLDWIDE CORP	WYN	74.01%	0.00%	25.99%
XILINX INC	XLNX	13.47%	0.00%	86.53%
YUM BRANDS INC	YUM	19.81%	0.00%	80.19%
Average		40.14%	0.91%	58.95%
Median		37.14%	0.00%	62.12%

Source: S&P Compustat, January 2009.

Cost of Debt

The expected return on debt, or the cost of debt capital (K_d), is the rate that investors would incur when financing the purchase of the operating assets of an interstate natural gas pipeline company. It is the cost of debt that is appropriate for the cost of capital study and it is relatively simple to estimate. Unlike the cost of equity, the required return on debt is directly observable in the market. It is best approximated by the current yield-to-maturity (yield) on the applicable debt. The YTM (yield to maturity) is the rate of return the existing bondholders expect to receive, and it is also a good estimate of K_d (cost of debt), the rate of return that new bondholders would require.³⁵ Often an average of recent yields is also used. The yield exemplifies the market's expectation of future returns. If the market's expectations of future debt returns were different from those implicit in the price, the market price of the debt would be bid up or down so that the market's expectations were reflected in the price.³⁶

From information in *Mergent Bond Database* (January 2009), we found the Moody's bond rating to be approximately **Baa2** to **Baa3** (average & median) and the *Standard & Poor's* long-term senior debt rating to be **BBB** to **BBB-** (average & median) for the typical interstate natural gas pipeline. The yield for utility, corporate, and industrial bonds rated **Baa** was **8.13%**, **8.45%**, and **8.76%** respectively as of December 31, 2008. Further, we took note of the yield to maturity for the *Value Line* Natural Gas Diversified Industry (All) group, the Value Line Oil/Gas Distribution Industry (All), the large companies form the former two groups and the Interstate Natural Gas Pipeline Forum Group and the Pipeline Screened Comparables Group. The results of those measurements is shown in the following box.

Pipeline Group	YTM 20+*		YTM All	
	Bond Avg	Bond Med	Bond Avg	Bond Med
VL Natural Gas Diversified Industry	8.50	7.45	9.30	8.25
VL Oil/Gas Distribution Industry	10.01	9.63	9.24	8.86
VL Natural Gas Divers. & Oil/Gas Large	9.46	9.35	8.56	8.51
Interstate Nat. Gas Pipeline Forum	10.02	9.49	8.34	8.54
Screened Comparables	9.30	7.80	8.10	7.52

* YTM 20+ = yield to maturity for bonds with at least 20 years to maturity.

Finally, to focus on the mid to lower end of the Baa spectrum (where the interstate natural gas pipelines tend to congregate), we took note of the Moody's and Standard & Poor's yields to

³⁵ Brigham, Eugene F. & Michael C. Ehrhardt, *Financial Management: Theory and Practice*, 10th ed. (Thomson Learning, Inc.: Stamford, CT, 2002), p. 423.

³⁶ *Stocks, Bonds, Bills and Inflation: 2008 Yearbook, Valuation Edition* (Chicago: Morningstar, Inc., 2008), p. 33.

maturity for all oil and gas bonds rated Baa2 to Baa3 and BBB to BBB- bonds, again broken down between at least 20 years to maturity and all bonds regardless of maturity date. The following tables show the results of that extensive research.

Moody's & Standard & Poor's Ratings & YTM for Oil and Gas Industry Bonds
Oil and Gas Industry Bonds (Rated Baa2 to Baa3 and BBB to BBB-)

Moody's Ratings 554 Issues	Average YTM 20+ Baa2 Oil and Gas Bonds	8.10
	Average YTM all Baa2 Oil and Gas Bonds	7.79
	Average YTM 20+ Baa3 Oil and Gas Bonds	9.21
	Average YTM all Baa3 Oil and Gas Bonds	8.25

S&P Ratings 1,289 Issues	Average YTM 20+ BBB Oil and Gas Bonds	8.64
	Average YTM all BBB Oil and Gas Bonds	7.64
	Average YTM 20+ BBB- Oil and Gas Bonds	8.51
	Average YTM all BBB- Oil and Gas Bonds	8.27

Source: *Mergent Bond Database*, Jan. 2009.

From this information we determined the appropriate cost of debt capital to be **8.50%**. The following tables were used to illustrate the long-term debt ratings for the *Value Line* Natural Gas Industry and yield to maturity (YTM) for public utility bonds and corporate bonds as reported in *Mergent Bond Record*.

Value Line Natural Gas Diversified Industry (All)
S&P and Mergent Long-Term Debt Ratings - January 1, 2009

Company Name	Ticker	S&P Rating	Numerical Rating	Mergent Rating	Numerical Rating
ATP Oil & Gas Corp	ATPG				
Cabot Oil & Gas 'A'	COG				
Callon Pete Co	CPE				
Chesapeake Energy	CHK	BB	14	Ba3	15
Crosstex Energy	XTXI				
Crosstex Energy LP	XTEX				
Delta Natural Gas	DGAS	A	8		
Devon Energy	DVN	BBB+	10	Baa1	10
Dynegy Inc. 'A'	DYN	B	17	B2	17
EOG Resources	EOG	A-	9	A3	9
Eagle Rock Energy Partners Ltd	EROC				
El Paso Corp.	EP	BB-	15	Ba3	15
Energen Corp.	EGN	A-	9	Baa3	12
Enterprise Products	EPD	BBB-	12	Baa3	12
Equitable Resources	EQT	A	8	Baa1	10
MDU Resources	MDU	A-	9	A2	8
Markwest Energy Partners LP	MWE	B+	16	B2	17
National Fuel Gas	NFG	BBB+	10	Baa1	10
Newfield Exploration	NFX	BB-	15	Ba3	15
ONEOK Inc.	OKE	BBB	11	Baa2	11
ONEOK Partners LP	OKS	BBB	11	Baa2	11
Penn Virginia Corp.	PVA				
Petroleum Development Corp.	PETD				
Quest Resource Corp	QRCP				
Questar Corp.	STR	A-	9	A3	9
Quicksilver Res.	KWK	B	17	B2	17
Southwestern Energy	SWN	BBB	11	Ba2	14
XTO Energy	XTO	BBB	11	Baa2	11
Average		BBB-	12	Baa3	12
Median		BBB	11	Baa3	12

* Yield to Maturity for bonds with 20+ years to maturity. Source: *Mergent Database*, Jan. 2009.

Value Line Oil/Gas Distribution
S&P and Mergent Long-Term Debt Ratings - January 1, 2009

Company Name	Ticker	S&P Rating	Numerical Rating	Mergent Rating	Numerical Rating
Adino Energy Corp	ADNY				
Boardwalk Pipeline	BWP	BBB-	12	Baa2	11
Buckeye Partners L.P.	BPL	BBB	11	Baa2	11
Clean Energy Fuels	CLNE				
El Paso Pipeline Partners L.P.	EPB				
Enbridge Energy Partners LLP	EEP	BBB	11	Baa2	11
Enbridge Inc.	ENB.TO	A-	9	Baa1	10
Energy Transfer	ETP	BBB-	12	Baa3	12
Kinder Morgan Energy	KMP	BBB	11	Baa2	11
Magellan Midstream	MMP				
Plains All Amer. Pipe.	PAA	BBB-	12	Baa3	12
Rio Vista Energy Partners L.P.	RVEP				
Southern Union	SUG	BBB-	12	Baa3	12
Spectra Energy	SE	BBB	11	Baa1	10
Suburban Propane	SPH				
TEPPCO Partners L.P.	TPP	BBB-	12	Baa3	12
Williams Cos.	WMB	BB+	13	Baa3	12
	Average	BBB	11	Baa2	11
	Median	BBB-	12	Baa2	11

* Yield to Maturity for bonds with 20+ years to maturity. Source: *Mergent Database*, Jan. 2009.

**VL Natural Gas Diversified & Oil/Gas Distribution - Large
S&P and Mergent Long-Term Debt Ratings - January 1, 2009**

Company Name	Ticker	S&P Rating	Numerical Rating	Mergent Rating	Numerical Rating
Chesapeake Energy	CHK	BB	14	Ba3	15
Crosstex Energy	XTXI				
Crosstex Energy LP	XTEX				
Devon Energy	DVN	BBB+	10	Baa1	10
Dynegy Inc. 'A'	DYN	B	17	B2	17
EOG Resources	EOG	A-	9	A3	9
Eagle Rock Energy Partners Ltd	EROC				
El Paso Corp.	EP	BB-	15	Ba3	15
Enbridge Energy Partners LLP	EEL	BBB	11	Baa2	11
Enbridge Inc.	ENB.TO	A-	9	Baa1	10
Energen Corp.	EGN	A-	9	Baa3	12
Energy Transfer	ETP	BBB-	12	Baa3	12
Enterprise Products	EPD	BBB-	12	Baa3	12
Equitable Resources	EQT	A	8	Baa1	10
Kinder Morgan Energy	KMP	BBB	11	Baa2	11
MDU Resources	MDU	A-	9	A2	8
Magellan Midstream	MMP				
National Fuel Gas	NFG	BBB+	10	Baa1	10
Newfield Exploration	NFX	BB-	15	Ba3	15
ONEOK Inc.	OKE	BBB	11	Baa2	11
ONEOK Partners LP	OKS	BBB	11	Baa2	11
Penn Virginia Corp.	PVA				
Plains All Amer. Pipe.	PAA	BBB-	12	Baa3	12
Questar Corp.	STR	A-	9	A3	9
Southern Union	SUG	BBB-	12	Baa3	12
Southwestern Energy	SWN	BBB	11	Ba2	14
Spectra Energy	SE	BBB	11	Baa1	10
Suburban Propane	SPH				
TEPPCO Partners L.P.	TPP	BBB-	12	Baa3	12
Williams Cos.	WMB	BB+	13	Baa3	12
XTO Energy	XTO	BBB	11	Baa2	11
Average		BBB	11	Baa3	12
Median		BBB	11	Baa2	11

* Yield to Maturity for bonds with 20+ years to maturity. Source: *Mergent Database*, Jan. 2009.

Interstate Natural Gas Pipeline Forum (Pipelines)
S&P and Mergent Long-Term Debt Ratings - January 1, 2009

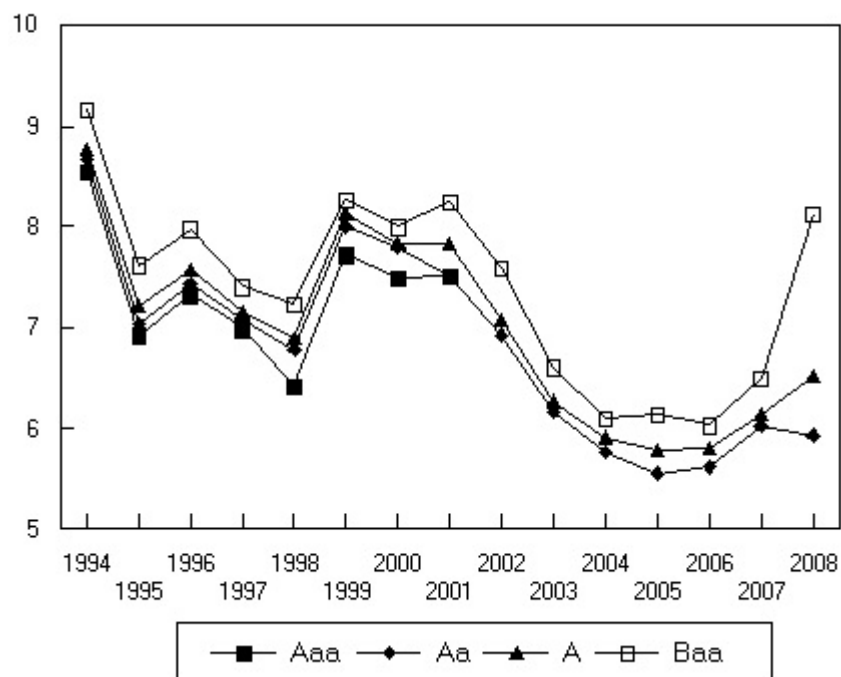
Company Name	Ticker	S&P Rating	Numerical Rating	Mergent Rating	Numerical Rating
Boardwalk Pipeline	BWP	BBB-	12	Baa2	11
CenterPoint Energy	CNP	BBB	11	Baa3	12
El Paso Corp.	EP	BB-	15	Ba3	15
Kinder Morgan Energy	KMP	BBB	11	Baa2	11
MDU Resources	MDU	A-	9	A2	8
National Fuel Gas	NFG	BBB+	10	Baa1	10
ONEOK Partners LP	OKS	BBB	11	Baa2	11
Questar Corp.	STR	A-	9	A3	9
Southern Union	SUG	BBB-	12	Baa3	12
Spectra Energy	SE	BBB	11	Baa1	10
TransCanada Corp.	TRP	A-	9	A3	9
Williams Cos.	WMB	BB+	13	Baa3	12
Average		BBB	11	Baa2	11
Median		BBB	11	Baa2	11

* Yield to Maturity for bonds with 20+ years to maturity. Source: *Mergent Database*, Jan. 2009.

Mergent Utility Bond Yields

Public Utility Yields (1994 - 2008)

Year End Data

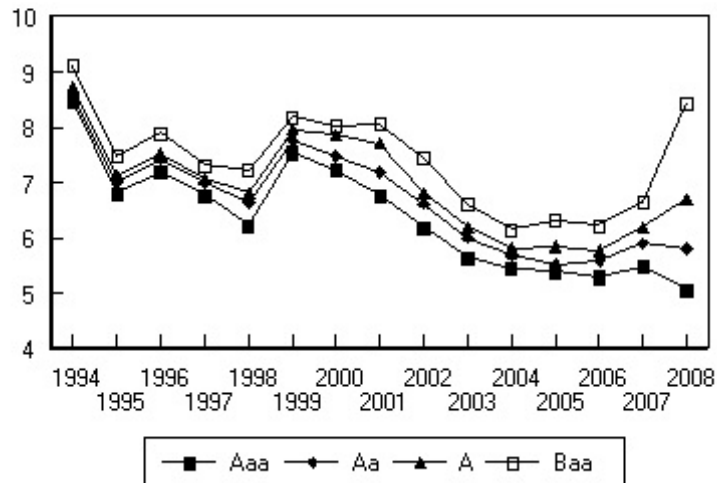


Public Utility Bond Yields - Year End Data (1994-2008)				
Year End Date	Aaa	Aa	A	Baa
1994	8.55	8.69	8.76	9.16
1995	6.94	7.03	7.23	7.63
1996	7.33	7.44	7.59	7.98
1997	6.99	7.07	7.16	7.41
1998	6.43	6.78	6.91	7.24
1999	7.74	8.00	8.14	8.28
2000	7.51	7.79	7.84	8.01
2001	7.53	7.53	7.83	8.27
2002	---	6.94	7.07	7.61
2003	---	6.18	6.27	6.61
2004	---	5.78	5.92	6.10
2005	---	5.55	5.80	6.14
2006	---	5.62	5.81	6.05
2007	---	6.03	6.16	6.51
2008	---	5.93	6.54	8.13

Source: Mergent's Bond Record, January 1995 - 2009

Mergent Corporate Bond Yields

**Moody's Corporate Bond Yield Avg.
Corporate Avg. [Year End, 1994 - 2009]**



1994 - 2008				
Moody's Corporate Bond Yield Averages				
Corporate Averages - Year End Data				
Year End				
Date	Aaa	Aa	A	Baa
1994	8.46	8.62	8.73	9.11
1995	6.82	6.99	7.13	7.49
1996	7.20	7.41	7.51	7.89
1997	6.76	6.99	7.05	7.32
1998	6.22	6.65	6.80	7.23
1999	7.55	7.78	7.96	8.19
2000	7.21	7.48	7.88	8.02
2001	6.76	7.19	7.70	8.05
2002	6.21	6.63	6.80	7.45
2003	5.65	6.02	6.19	6.60
2004	5.47	5.69	5.82	6.15
2005	5.38	5.51	5.84	6.33
2006	5.29	5.58	5.78	6.22
2007	5.49	5.91	6.19	6.65
2008	5.06	5.81	6.70	8.45

Source: *Mergent's Bond Record*, January 1995 - 2009.

Cost of Equity

We have estimated the cost of equity capital by employing several methods. The market cost of equity is generally considered to be the most difficult part of computing the cost of capital because it relies on interpretation of projections by market analysts as well as the projections of the equity models used by the appraiser. The market cost of equity capital is equal to the rate of return *expected* by investors at their perceived level of risk for a company's equity. There are several methods used to estimate the cost of equity capital. The most common methods are the Gordon growth model sometimes referred to as the discounted cash flow method (or DCF method), the risk premium method (RP), and the capital asset pricing model (CAPM).

All estimates of the cost of equity rates fall into one of two classes. They are either (1) add-ons to an interest rate, or (2) ratios of return to investment. Add-on estimates of the cost of equity capital include RP and the CAPM. The DCF method is a ratio of return to investment.

After computing the cost of equity by the DCF, RP, and CAPM methods, the data was analyzed and reconciled to obtain the cost of equity capital before flotation costs of **12.00%**. On the following page is a summary of the cost of equity calculations by each of the methods employed. The summary page is followed by an explanation of each method and the indicators found therein.

Summary of Cost of Equity Calculations

DCF Indicators - January 1, 2009

Company Groups	Value Line Data		S&P (IBES) Data	
	Average	Median	Average	Median
Value Line Natural Gas (Diversified) - All	15.61	13.17	17.85	12.96
Value Line Oil/Gas Distribution - All	18.34	19.41	16.83	16.46
VL Natural Gas Divers. & Oil/Gas Dist. - Large	16.88	14.69	16.87	15.51
Interstate Natural Gas Pipeline Forum (Pipes)	15.95	14.49	14.89	14.92
S&P Screened Comparables Group	10.55	11.35	15.23	13.32
Averages	15.47	14.62	16.33	14.63

The discounted cash flow method for above industry groups were calculated as follows:

Using *Value Line* data and *Value Line* earnings growth estimates and S&P's *Compustat* data with *Institutional Brokers Estimate System* (IBES) earnings growth.

Risk Premium Indicators - January 1, 2009

General Risk Premium Indicators

Indicators	Rates		Indicator
	Rf	Rp	
20-Year Treasury Bonds (ex post)	3.22	6.50	9.72
20-Year Treasury Bonds (ex ante)	3.22	10.22	13.44

Risk Premium Indicators by Groups

Indicators	Risk Premium	
	Average	Median
Natural Gas Diversified Industry (All)	14.00	12.95
Oil/Gas Distribution (All)	15.51	15.13
Natural Gas Diversified & Oil/Gas Distribution (Large)	14.96	14.85
Interstate Nat. Gas Pipeline Forum Group (Pipes)	15.52	14.99
Screened Comparables Group	14.80	13.30
Average	14.96	14.24

Risk Premium Formula: $Ke = Rf + Rp$

Base Rate: Yield to maturity on each company's long-term bonds,
Mergent Bond Record, January, 2009.

Risk Premium: *SBBI*, Morningstar, 2009 Corporate Bond RP of 5.5%.

Capital Asset Pricing Model (CAPM) - January 1, 2009

Item	Rates			CAPM Indicator
	Rf	Rp	Beta	
CAPM Indicator *				
Long-Term Gov't Bonds (ex post)	3.22	6.50	1.05	10.05
Long-Term Gov't Bonds (ex ante)	3.22	10.22	1.05	13.95

CAPM Formula: $Ke = Rf + B(Rp)$

* CAPM Indicator is based upon a *Value Line* beta of 1.05. Morningstar, 2009 *SBBI* & *Risk Premia over Time Report*, & Federal Reserve data Jan. 2, 2009.

DCF Method

The discounted cash flow method of estimating the cost of equity is based on the formula shown in Figure 2. Our computations using the DCF method are based upon information from the *Standard and Poor's Compustat* database, *Institutional Brokers Estimate System* (IBES), and the *Value Line Investment Survey* database. We began our analysis by screening the Standard and Poor's database of approximately 9,880 companies for companies with risk equal to the risk of the typical interstate natural gas pipeline. As a measure of financial risk the average Standard and Poor's rating on the long-term debt of companies comprising the large natural gas pipeline industry was **BBB**. Our first screening process was to find all companies having a S&P senior debt rating of BBB to BBB+ (the mid-rated triple B debt to the highest level triple B debt). This screening will give us a list of companies that have long-term debt which is believed to be either equal in risk or slightly less risky than the typical interstate natural gas pipeline. (Several of these companies have double B rated debt.) This measure is indicative of financial risk for the companies.

$$K_e = \frac{D_1}{P_0} + g$$

where

K_e = Cost of equity

D_1 = Expected Dividend in year 1

P_0 = Current price of stock

g = Growth in dividends

Figure 2

Next we screened the surviving group of companies by the return on net plant investment (before taxes). This is a measure of business risk and measures the ability of a company to compete in the market and maintain its rate of return before income taxes. From this calculation we screened out all companies varying more than fifty percent from the average return of the interstate natural gas pipelines industry.

Next we screened the surviving group of companies by their asset turnover ratios. The asset turnover ratio is found by dividing a company's total sales by its total assets. This ratio is indicative of the business risk faced by a company. It can be used to determine how competitive the company is within its industry and also how much capital must be invested to gain a dollar of sales. Thus, this ratio helps indicate the level of investment a competitor must invest to generate a competitive sales volume. We excluded all companies which varied more than fifty percent from the average asset turnover ratio of the interstate natural gas pipelines industry.

Next we screened the surviving group of companies by their S&P adjusted betas. Beta is a measurement of the sensitivity of a company's stock price to the overall fluctuation in the Standard & Poor's 500 (S&P 500) Index Price. For example, a beta of 1.5 indicates that a company's stock price tends to rise (or fall) 1.5%, with a 1% rise (or fall) in the index price. The S&P adjusted beta of the interstate natural gas pipeline industry averages approximately 1.00

presently. Thus we excluded all companies with S&P adjusted betas less than 0.9 and greater than 1.10. In our judgment, this range is a reasonable range of betas to use for comparison purposes in determining comparables of approximate risk to the natural gas pipelines. A table of risk screening data is shown below.

Pipeline Risk Screening Data - January 1, 2009
Value Line Natural Gas Diversified Industry (Large) S&P Data

Company Name	Ticker	S&P Debt Rating Letter	S&P Debt Rating Number	S&P Adj. Beta	Return on Net Invest.	Asset Turnover Ratio
Chesapeake Energy Corp	CHK	BB	14	1.34	9.35	0.28
Crosstex Energy Inc	XTXI			1.89	5.79	1.61
Crosstex Energy LP	XTEX			1.35	6.00	1.61
Devon Energy Corp	DVN	BBB+	10	0.95	16.10	0.30
Dynegy Inc	DYN	B	17	1.36	6.57	0.29
Eagle Rock Energy Prtnrs LP	EROC			0.97	(7.21)	0.65
El Paso Corp	EP	BB	14	1.23	8.93	0.18
Enbridge Energy Prtnrs LP	EEP	BBB	11	0.77	5.74	1.20
Enbridge Inc	ENB	A-	9	0.84	9.12	0.67
Energen Corp	EGN	BBB+	10	1.22	79.06	0.49
Energy Transfer Prtnrs LP	ETP	BBB-	12	0.83	14.95	1.03
Enterprise Prod Prtnrs LP	EPD	BBB-	12	0.71	7.05	1.11
EOG Resources Inc	EOG	A-	9	0.80	15.24	0.38
Equitable Resources Inc	EQT	BBB	11	0.96	11.02	0.38
Kinder Morgan Energy LP	KMP	BBB	11	0.46	11.33	0.67
Magellan Midstream Prtnrs LP	MMP	BBB	11	0.48	16.34	0.65
MDU Resources Group Inc	MDU	BBB+	10	1.18	15.22	0.81
National Fuel Gas Co	NFG	BBB+	10	0.93	15.41	0.60
Newfield Exploration Co	NFX	BB+	13	1.22	10.00	0.26
ONEOK Inc	OKE	BBB	11	0.99	14.04	1.25
ONEOK Prtnrs LP	OKS	BBB	11	0.65	11.92	1.05
Penn Virginia Corp	PVA			1.44	9.49	0.43
Plains All Amer Pipeline LP	PAA	BBB-	12	0.69	11.95	2.19
Questar Corp	STR			0.99	16.52	0.50
Southern Union Co	SUG	BBB-	12	1.20	8.51	0.37
Southwestern Energy Co	SWN	BB+	13	0.79	12.39	0.42
Spectra Energy Corp	SE	BBB+	10	0.98	10.08	0.22
Suburban Propane Prtnrs LP	SPH	BB-	15	0.71	40.82	1.57
TEPPCO Partners LP	TPP	BBB-	12	0.55	12.87	2.23
Williams Cos Inc	WMB	BBB-	12	1.15	11.61	0.42
XTO Energy Inc	XTO	BBB	11	0.89	16.80	0.35
Average		BBB-	12	0.98	13.97	0.78

Source: S&P Compustat, January 2009.

Surviving the screening process are eight (8) companies, which in general should be approximately of equal or slightly less risk when compared to the interstate natural gas pipeline

industry. These companies are:

Burlington Northern
CenterPoint Energy
Constellation Energy
Embarq Corp.

Int'l Speedway 'A'
Rayonier, Inc.
Seacor Holdings
U.S. Cellular

In addition to performing a DCF analysis for the companies listed above of approximately equal or slightly less risk to the interstate natural gas pipelines, we performed additional DCF analyses on four (4) other groups of companies; the Value Line natural gas (diversified) group (all companies), the Value Line oil/gas distribution group (all companies), the Value Line natural gas (diversified) group combined with the Value Line oil/gas distribution group (large companies – with over \$750 million in annual sales), and the interstate natural gas pipeline forum group (traded) that are heavily involved with pipelines. We used financial data from two independent sources, *Standard and Poor's Compustat* database, and the *Value Line Investment Survey*. The two independent sources of data gave us two sets of growth estimates for the five groups of companies. The growth estimates considered were provided by *Value Line* and the *Institutional Brokers Estimate System* (IBES) through the *Standard and Poor's Compustat* database. From these analysts' projections we calculated DCF indicators on all groupings and calculated a simple average and median indicator. We gave the most weight to the median indicator in each grouping. The median indicator is not affected by extreme values and outliers and thus is a very good indicator of central tendency of a representative sample of companies. We placed the most confidence in the estimates provided by the IBES projections, because these estimates were provided by a large group of financial analysts who monitor these companies.³⁷ It is our opinion, based on this documented data, that the appropriate cost of equity for the interstate natural gas pipeline industry by the DCF method is **14.50%** as of January 1, 2009. The result of all of the DCF analysis and research can be found on the following pages.

³⁷ The Institutional Brokers Estimate System (IBES) is a database provided through *Standard & Poor's Compustat* of earnings expectations obtained from more than 3,500 security analysts from over 300 contributing firms.

Summary of DCF Method Indicators

Company Groups	Value Line Data		S&P (IBES) Data	
	Average	Median	Average	Median
Value Line Natural Gas (Diversified) - All	15.61	13.17	17.85	12.96
Value Line Oil/Gas Distribution - All	18.34	19.41	16.83	16.46
VL Natural Gas Divers. & Oil/Gas Dist. - Large	16.88	14.69	16.87	15.51
Interstate Natural Gas Pipeline Forum (Pipes)	15.95	14.49	14.89	14.92
S&P Screened Comparables Group	10.55	11.35	15.23	13.32
Averages	15.47	14.62	16.33	14.63

The discounted cash flow method for above industry groups were calculated as follows:

Using *Value Line* data and *Value Line* earnings growth estimates and S&P's *Compustat* data with *Institutional Brokers Estimate System* (IBES) earnings growth.

Value Line Natural Gas Diversified Industry (All)
DCF Indicator (VL Data) - January 1, 2009

Company Name	Ticker	% Cur Yld	EPS Gth	DCF
ATP Oil & Gas Corp	ATPG		10.00	
Cabot Oil & Gas 'A'	COG	0.46	11.00	11.46
Callon Pete Co	CPE		10.00	
Chesapeake Energy	CHK	1.85	5.50	7.35
Crosstex Energy	XTXI	32.82	4.50	37.32
Crosstex Energy LP	XTEX		9.00	
Delta Natural Gas	DGAS		3.00	
Devon Energy	DVN	0.97	11.00	11.97
Dynegy Inc. 'A'	DYN			
EOG Resources	EOG	0.82	14.00	14.82
Eagle Rock Energy Partners Ltd	EROC		6.00	
El Paso Corp.	EP	2.55	21.00	23.55
Energen Corp.	EGN	1.77	5.00	6.77
Enterprise Products	EPD	10.51	15.50	26.01
Equitable Resources	EQT	2.77	15.50	18.27
MDU Resources	MDU	2.87	7.00	9.87
Markwest Energy Partners LP	MWE		6.00	
National Fuel Gas	NFG	4.14	7.00	11.14
Newfield Exploration	NFX		9.50	
ONEOK Inc.	OKE	5.56	9.00	14.56
ONEOK Partners LP	OKS			
Penn Virginia Corp.	PVA			
Petroleum Development Corp.	PETD		20.00	
Quest Resource Corp	QRCP			
Questar Corp.	STR	1.53	9.50	11.03
Quicksilver Res.	KWK		28.50	
Southwestern Energy	SWN		33.50	
XTO Energy	XTO	1.36	13.00	14.36
	Average	5.00	11.83	15.61
	Median	2.20	9.75	13.17

Source: *Value Line* CD Rom, January 2009.

Value Line Oil/Gas Distribution Industry (All)
DCF Indicator (VL Data) - January 1, 2009

Company Name	Ticker	% Cur Yld	EPS Gth	DCF
Adino Energy Corp	ADNY			
Boardwalk Pipeline	BWP	11.13	6.50	17.63
Buckeye Partners L.P.	BPL	11.25	8.50	19.75
Clean Energy Fuels	CLNE			
El Paso Pipeline Partners L.P.	EPB		8.00	
Enbridge Energy Partners LLP	EEP		3.67	
Enbridge Inc.	ENB.TO	3.74	8.00	11.74
Energy Transfer	ETP	11.05	12.00	23.05
Kinder Morgan Energy	KMP	8.91	10.50	19.41
Magellan Midstream	MMP	9.30	7.50	16.80
Plains All Amer. Pipe.	PAA	10.55	0.50	11.05
Rio Vista Energy Partners L.P.	RVEP			
Southern Union	SUG	4.60	8.00	12.60
Spectra Energy	SE	6.48		
Suburban Propane	SPH	9.36	14.00	23.36
TEPPCO Partners L.P.	TPP	15.07	6.00	21.07
Williams Cos.	WMB	3.24	22.00	25.24
	Average	8.72	8.86	18.34
	Median	9.33	8.00	19.41

Source: *Value Line* CD Rom, January 2009.

VL Natural Gas Diversified & Oil/Gas Distribution - Large
DCF Indicator (VL Data) - January 1, 2009

Company Name	Ticker	% Cur Yld	EPS Gth	DCF
Chesapeake Energy	CHK	1.85	5.50	7.35
Crosstex Energy	XTXI	32.82	4.50	37.32
Crosstex Energy LP	XTEX		9.00	
Devon Energy	DVN	0.97	11.00	11.97
Dynegy Inc. 'A'	DYN			
EOG Resources	EOG	0.82	14.00	14.82
Eagle Rock Energy Partners Ltd	EROC		6.00	
El Paso Corp.	EP	2.55	21.00	23.55
Enbridge Energy Partners LLP	EEP		3.67	
Enbridge Inc.	ENB.TO	3.74	8.00	11.74
Energen Corp.	EGN	1.77	5.00	6.77
Energy Transfer	ETP	11.05	12.00	23.05
Enterprise Products	EPD	10.51	15.50	26.01
Equitable Resources	EQT	2.77	15.50	18.27
Kinder Morgan Energy	KMP	8.91	10.50	19.41
MDU Resources	MDU	2.87	7.00	9.87
Magellan Midstream	MMP	9.30	7.50	16.80
National Fuel Gas	NFG	4.14	7.00	11.14
Newfield Exploration	NFX		9.50	
ONEOK Inc.	OKE	5.56	9.00	14.56
ONEOK Partners LP	OKS			
Penn Virginia Corp.	PVA			
Plains All Amer. Pipe.	PAA	10.55	0.50	11.05
Questar Corp.	STR	1.53	9.50	11.03
Southern Union	SUG	4.60	8.00	12.60
Southwestern Energy	SWN		33.50	
Spectra Energy	SE	6.48		
Suburban Propane	SPH	9.36	14.00	23.36
TEPPCO Partners L.P.	TPP	15.07	6.00	21.07
Williams Cos.	WMB	3.24	22.00	25.24
XTO Energy	XTO	1.36	13.00	14.36
	Average	6.60	10.65	16.88
	Median	4.14	9.00	14.69

Source: *Value Line* CD Rom, January 2009.

Value Line Natural Gas Diversified Industry (All)
DCF Indicator (S&P Data) - January 1, 2009

Company Name	Ticker	Current Yield	EPS Growth	DCF
ATP OIL & GAS CORP	ATPG		7.50	
CABOT OIL & GAS CORP	COG	0.50	8.00	8.50
CALLON PETROLEUM CO/DE	CPE		10.00	
CHESAPEAKE ENERGY CORP	CHK	2.00	8.00	10.00
CROSSTEX ENERGY INC	XTXI	32.08	(2.25)	
CROSSTEX ENERGY LP	XTEX	49.89	9.00	58.89
DELTA NATURAL GAS CO INC	DGAS			
DEVON ENERGY CORP	DVN	1.04	6.50	7.54
DYNEGY INC	DYN		6.30	
EAGLE ROCK ENERGY PARTNRS LP	EROC	35.17	1.00	36.17
EL PASO CORP	EP	2.76	8.00	10.76
ENERGEN CORP	EGN	1.69	3.50	5.19
ENTERPRISE PRODS PRTNER -LP	EPD	10.99	9.00	19.99
EOG RESOURCES INC	EOG	0.89	10.00	10.89
EQUITABLE RESOURCES INC	EQT	2.91	11.00	13.91
MARKWEST ENERGY PARTNERS LP	MWE	34.17	6.50	40.67
MDU RESOURCES GROUP INC	MDU	3.25	13.00	16.25
NATIONAL FUEL GAS CO	NFG	4.36	5.00	9.36
NEWFIELD EXPLORATION CO	NFX		8.00	
ONEOK INC	OKE	6.04	10.00	16.04
ONEOK PARTNERS -LP	OKS	10.01	5.50	15.51
PENN VIRGINIA CORP	PVA	1.03	19.00	20.03
PETROLEUM DEVELOPMENT CORP	PETD		15.50	
QUEST RESOURCE CORP	QRCP			
QUESTAR CORP	STR	1.65	8.00	9.65
QUICKSILVER RESOURCES INC	KWK		20.05	
SOUTHWESTERN ENERGY CO	SWN		37.00	
XTO ENERGY INC	XTO	1.50	10.50	12.00
Average		10.63	9.75	17.85
Median		2.91	8.00	12.96

Source: S&P Compustat, January 2009.

Value Line Oil/Gas Distribution Industry (All)
DCF Indicator (S&P Data) - January 1, 2009

Company Name	Ticker	Current Yield	EPS Growth	DCF
ADINO ENERGY CORP	3ADNY			
BOARDWALK PIPELINE PARTNERS	BWP	11.65	9.00	20.65
BUCKEYE PARTNERS LP	BPL	11.18	3.00	14.18
CLEAN ENERGY FUELS CORP	CLNE		27.50	
EL PASO PIPELINE PARTNERS LP	EPB	8.40	9.25	17.65
ENBRIDGE ENERGY PRTNRS -LP	EEP	16.00	3.00	19.00
ENBRIDGE INC	ENB			
ENERGY TRANSFER PARTNERS -LP	ETP			
KINDER MORGAN ENERGY -LP	KMP	9.50	6.50	16.00
MAGELLAN MIDSTREAM PRTNRS LP	MMP	9.86	6.00	15.86
PLAINS ALL AMER PIPELINE -LP	PAA	10.91	6.00	16.91
RIO VISTA ENERGY PARTNERS LP	RVEP			
SOUTHERN UNION CO	SUG	5.03	9.30	14.33
SPECTRA ENERGY CORP	SE	6.77	6.50	13.27
SUBURBAN PROPANE PRTNRS -LP	SPH	9.54	5.00	14.54
TEPPCO PARTNERS -LP	TPP	15.63	5.50	21.13
WILLIAMS COS INC	WMB	3.49	15.00	18.49
Average		9.83	8.58	16.83
Median		9.70	6.50	16.46

Source: *S&P Compustat*, January 2009.

VL Natural Gas Diversified & Oil/Gas Distribution - Large
DCF Indicator (S&P Data) - January 1, 2009

Company Name	Ticker	Current Yield	EPS Growth	DCF
CHESAPEAKE ENERGY CORP	CHK	2.00	8.00	10.00
CROSSTEX ENERGY INC	XTXI	32.08	(2.25)	
CROSSTEX ENERGY LP	XTEX	49.89	9.00	58.89
DEVON ENERGY CORP	DVN	1.04	6.50	7.54
DYNEGY INC	DYN		6.30	
EAGLE ROCK ENERGY PARTNRS LP	EROC	35.17	1.00	36.17
EL PASO CORP	EP	2.76	8.00	10.76
ENBRIDGE ENERGY PRTNRS -LP	EEP	16.00	3.00	19.00
ENBRIDGE INC	ENB			
ENERGEN CORP	EGN	1.69	3.50	5.19
ENERGY TRANSFER PARTNERS -LP	ETP			
ENTERPRISE PRODS PRTNER -LP	EPD	10.99	9.00	19.99
EOG RESOURCES INC	EOG	0.89	10.00	10.89
EQUITABLE RESOURCES INC	EQT	2.91	11.00	13.91
KINDER MORGAN ENERGY -LP	KMP	9.50	6.50	16.00
MAGELLAN MIDSTREAM PRTNRS LP	MMP	9.86	6.00	15.86
MDU RESOURCES GROUP INC	MDU	3.25	13.00	16.25
NATIONAL FUEL GAS CO	NFG	4.36	5.00	9.36
NEWFIELD EXPLORATION CO	NFX		8.00	
ONEOK INC	OKE	6.04	10.00	16.04
ONEOK PARTNERS -LP	OKS	10.01	5.50	15.51
PENN VIRGINIA CORP	PVA	1.03	19.00	20.03
PLAINS ALL AMER PIPELNE -LP	PAA	10.91	6.00	16.91
QUESTAR CORP	STR	1.65	8.00	9.65
SOUTHERN UNION CO	SUG	5.03	9.30	14.33
SOUTHWESTERN ENERGY CO	SWN		37.00	
SPECTRA ENERGY CORP	SE	6.77	6.50	13.27
SUBURBAN PROPANE PRTNRS -LP	SPH	9.54	5.00	14.54
TEPPCO PARTNERS -LP	TPP	15.63	5.50	21.13
WILLIAMS COS INC	WMB	3.49	15.00	18.49
XTO ENERGY INC	XTO	1.50	10.50	12.00
Average		9.77	8.58	16.87
Median		5.54	8.00	15.51

Source: S&P Compustat, January 2009.

Interstate Natural Gas Pipeline Forum (Pipelines)
DCF Indicator (VL Data) - January 1, 2009

Company Name	Ticker	% Cur Yld	EPS Gth	DCF
Boardwalk Pipeline	BWP	11.13	6.50	17.63
CenterPoint Energy	CNP	6.18	7.50	13.68
El Paso Corp.	EP	2.55	21.00	23.55
Kinder Morgan Energy	KMP	8.91	10.50	19.41
MDU Resources	MDU	2.87	7.00	9.87
National Fuel Gas	NFG	4.14	7.00	11.14
ONEOK Partners LP	OKS			
Questar Corp.	STR	1.53	9.50	11.03
Southern Union	SUG	4.60	8.00	12.60
Spectra Energy	SE	6.48		
TransCanada Corp.	TRP	5.30	10.00	15.30
Williams Cos.	WMB	3.24	22.00	25.24
Average		5.18	10.90	15.95
Median		4.60	8.75	14.49

Source: *Value Line* CD Rom, January 2009.

Interstate Natural Gas Pipeline Forum (Pipelines)
DCF Indicator (S&P Data) - January 1, 2009

Company Name	Ticker	Current Yield	EPS Growth	DCF
BOARDWALK PIPELINE PARTNERS	BWP	11.65	9.00	20.65
CENTERPOINT ENERGY INC	CNP	6.83	18.00	24.83
EL PASO CORP	EP	2.76	8.00	10.76
KINDER MORGAN ENERGY -LP	KMP	9.50	6.50	16.00
MDU RESOURCES GROUP INC	MDU	3.25	13.00	16.25
NATIONAL FUEL GAS CO	NFG	4.36	5.00	9.36
ONEOK PARTNERS -LP	OKS	10.01	5.50	15.51
QUESTAR CORP	STR	1.65	8.00	9.65
SOUTHERN UNION CO	SUG	5.03	9.30	14.33
SPECTRA ENERGY CORP	SE	6.77	6.50	13.27
TRANSCANADA CORP	TRP	4.56	5.00	9.56
WILLIAMS COS INC	WMB	3.49	15.00	18.49
Average		5.82	9.07	14.89
Median		4.80	8.00	14.92

Source: *S&P Compustat*, January 2009.

Pipeline Screened Comparables Group
DCF Indicator (VL Data) - January 1, 2009

Company Name	Ticker	% Cur Yld	EPS Gth	DCF
Burlington Northern	BNI	2.11	7.00	9.11
CenterPoint Energy	CNP	6.18	7.50	13.68
Constellation Energy	CEG	3.58	10.00	13.58
Embarq Corp.	EQ	7.64	0.50	8.14
Int'l Speedway 'A'	ISCA	0.41	4.00	4.41
Rayonier Inc.	RYN	6.38	8.00	14.38
Seacor Holdings	CKH			
U.S. Cellular	USM		8.50	
	Average	4.38	6.50	10.55
	Median	4.88	7.50	11.35

Source: *Value Line* CD Rom, January 2009.

Pipeline Screened Comparables Group
DCF Indicator (S&P Data) - January 1, 2009

Company Name	Ticker	Current Yield	EPS Growth	DCF
BURLINGTON NORTHERN SANTA FE	BNI	2.35	11.00	13.35
CENTERPOINT ENERGY INC	CNP	6.83	18.00	24.83
CONSTELLATION ENERGY GRP INC	CEG	8.67	13.90	22.57
EMBARQ CORP	EQ	7.88	3.00	10.88
INTL SPEEDWAY CORP -CL A	ISCA	0.44	6.00	6.44
RAYONIER INC	RYN	6.79	6.50	13.29
SEACOR HOLDINGS INC	CKH			
US CELLULAR CORP	USM		3.00	
	Average	4.71	8.77	15.23
	Median	6.79	6.50	13.32

Source: *S&P Compustat*, January 2009.

Risk Premium Method

The risk premium method is a standard method of estimating the cost of equity (K_e) based on the formula in Figure 3. This method sums two elements of risk — a risk free rate, which is the price of time (the reward for deferring consumption and for not exposing funds to risk), and a risk premium, which is the additional reward for assuming risk. The nominal risk free rate includes the real risk free rate and an inflation premium. The risk premium includes an interest rate risk, business risk, financial risk, and liquidity risk. All of these elements are included when calculating equity cost by the risk premium method.

$$K_e = R_f + R_p$$

where

K_e = Cost of equity

R_f = Risk free rate

R_p = Risk premium

Figure 3

Our risk premium calculations included computations for two categories of risk premium indicators — general indicators and indicators for the Value Line Natural Gas Diversified (all) group, the Value Line Natural Oil/Gas Distribution (all) group, the combined Value Line Natural Gas Diversified and Value Line Oil/Gas Distribution (large) group, the Interstate Natural Gas Pipeline Forum (Pipes) group, and the screened comparables group. Our ex post risk premiums were derived from the *2009 Valuation Edition of Stocks, Bonds, Bills and Inflation* (SBBI), published by Morningstar. Our ex ante risk premium was derived from the market-weighted expected cost of capital for the S&P 500 less the current 20-year Treasury bond rate. Our relevant current ‘safe rates’ for the general indicators were derived from the sources footnoted below.³⁸ The ‘safe rates’ (or base rates) used for each company within the company groupings were the average yields to maturity for the long-term debt (20+ years to maturity) of each company in *Mergent Bond Record* database (January, 2009). The average yield to maturity for each company’s bonds was added to the SBBI corporate bond risk premium of 5.5% to obtain an individual estimate for each company in the group. Thus, the risk premium indicators for the individual groups are specific for each company within the group and, thus, as individualized as possible for each company.

The general Risk Premium (or equity build-up method) indicators, using the risk premium from *SBBI* published by Morningstar, indicates a cost of equity capital of 9.72% (ex post) and 13.44% (ex ante).

The range for all calculations of averages of risk premiums using the indicators by specific company groups are between 12.95% and 15.52%. This measurement involved the use of the average long-term yields to maturity for company bonds with at least 20 years to maturity

³⁸ Morningstar, *2009 SBBI & 2009 Ibbotson Risk Premia Over time Report* and The Federal Reserve, Dec. 31, 2007.

plus the corporate bond risk premium of 5.5%. A reasonable view of these results would indicate a risk premium correlated indicator for the specific companies to be approximately 14.50%.

For the general indicators discussed on the previous page the ex post and ex ante indicators using the long-term government bonds are deemed appropriate because a purchase of an interstate natural gas pipeline company is considered a long-term commitment of capital, and thus the long-term bond risk premium should be indicative of the cost of long-term equity capital for the typical company. These indicators together would support a cost of equity of 11.50%.

The long-term bond risk premium indicators are well supported by the estimates derived from the specific indicators from the yields to maturity of all of the groups of interstate natural gas pipeline industry bonds with 20 years or more to maturity. We believe the appropriate cost of equity for the typical interstate natural gas pipeline by the risk premium method as of January 1, 2009 is **12.50%**. This conclusion gives weight and consideration to all indicators. A summary of the cost of equity indicators by the risk premium method (or equity build-up method) is below and the supporting data begins on the following page.

Risk Premium Indicators - January 1, 2009

General Risk Premium Indicators

Indicators	Rates		Indicator
	Rf	Rp	
20-Year Treasury Bonds (ex post indicator)	3.22	6.50	9.72
20-Year Treasury Bonds (ex ante indicator)	3.22	10.22	13.44

Risk Premium Indicators by Groups

Indicators	Risk Premium	
	Average	Median
Natural Gas Diversified Industry (All)	14.00	12.95
Oil/Gas Distribution (All)	15.51	15.13
Natural Gas Diversified & Oil/Gas Distribution (Large)	14.96	14.85
Interstate Nat. Gas Pipeline Forum Group (Pipes)	15.52	14.99
Screened Comparables Group	14.80	13.30
Average	14.96	14.24

Risk Premium Formula: $K_e = R_f + R_p$

Base Rate: Yield to maturity on each company's long-term bonds, *Mergent Bond Record*, Jan.

2009. Risk Premium: SBBI, Morningstar, 2009 Corporate Bond RP of 5.5%.

Summary Statistics of Annual Returns: Basic Series (in percent)

Preliminary Data

2008 Ibbotson SBBI Valuation Yearbook: Table 2-1, page 28

From 1926 to 2008

Series	Geometric Mean	Arithmetic Mean	Standard Deviation
Large Company Stocks			
Total Returns ¹	9.6	11.7	20.6
Income	4.2	4.2	1.6
Capital Appreciation	5.3	7.3	19.8
Ibbotson Small Company Stocks			
Total Returns	11.7	16.4	33.0
Mid-Cap Stocks ^{2,5}			
Total Returns	10.5	13.4	24.9
Income	4.0	4.0	1.7
Capital Appreciation	6.4	9.2	24.2
Low-Cap Stocks ^{3,5}			
Total Returns	10.9	14.9	29.4
Income	3.6	3.6	2.0
Capital Appreciation	7.2	11.0	28.7
Micro-Cap Stocks ^{4,5}			
Total Returns	11.6	17.7	39.2
Income	2.5	2.6	1.8
Capital Appreciation	9.0	15.1	38.6
Long-Term Corporate Bonds			
Total Returns	5.9	6.2	8.4
Long-Term Government Bonds			
Total Returns	5.7	6.1	9.4
Income	5.2	5.2	2.7
Capital Appreciation	0.3	0.6	8.2
Intermediate-Term Government Bonds			
Total Returns	5.4	5.6	5.7
Income	4.7	4.7	2.9
Capital Appreciation	0.6	0.7	4.5
Treasury Bills			
Total Returns	3.7	3.8	3.1
Inflation			
	3.0	3.1	4.2

¹ Total return is equal to the sum of three component returns: income return, capital appreciation return, and reinvestment return.

² Mid-Cap stocks are represented here by CRSP NYSE/AMEX/NASDAQ deciles 3-5.

³ Low-Cap stocks are represented here by CRSP NYSE/AMEX/NASDAQ deciles 6-8.

⁴ Micro-Cap stocks are represented here by CRSP NYSE/AMEX/NASDAQ deciles 9-10.

⁵ Source of underlying returns and breakpoints for NYSE/AMEX/NASDAQ deciles: ©200801 CRSP®, Center for Research in Security Prices, Graduate School of Business, The University of Chicago used with permission. All rights reserved. www.crsp.chicagogsb.edu.

Value Line Natural Gas Diversified Industry (All)
Yield to Maturity for Long-Term Debt - January 1, 2009

Company Name	Ticker	Mergent Rating	Numerical Rating	YTM* 20+ Bonds	Risk Prem. Indicator
ATP Oil & Gas Corp	ATPG				
Cabot Oil & Gas 'A'	COG				
Callon Pete Co	CPE				
Chesapeake Energy	CHK	Ba3	15	6.61	12.11
Crosstex Energy	XTXI				
Crosstex Energy LP	XTEX				
Delta Natural Gas	DGAS				
Devon Energy	DVN	Baa1	10	7.02	12.52
Dynegy Inc. 'A'	DYN	B2	17		
EOG Resources	EOG	A3	9		
Eagle Rock Energy Partners Ltd	EROC				
El Paso Corp.	EP	Ba3	15	12.59	18.09
Energen Corp.	EGN	Baa3	12	6.03	11.53
Enterprise Products	EPD	Baa3	12	12.73	18.23
Equitable Resources	EQT	Baa1	10		
MDU Resources	MDU	A2	8		
Markwest Energy Partners LP	MWE	B2	17		
National Fuel Gas	NFG	Baa1	10		
Newfield Exploration	NFX	Ba3	15		
ONEOK Inc.	OKE	Baa2	11	8.85	14.35
ONEOK Partners LP	OKS	Baa2	11	9.21	14.71
Penn Virginia Corp.	PVA				
Petroleum Development Corp.	PETD				
Quest Resource Corp	QRCP				
Questar Corp.	STR	A3	9	6.04	11.54
Quicksilver Res.	KWK	B2	17		
Southwestern Energy	SWN	Ba2	14		
XTO Energy	XTO	Baa2	11	7.45	12.95
	Average	Baa3	12	8.50	14.00
	Median	Baa3	12	7.45	12.95

* Yield to Maturity for bonds with 20+ years to maturity. Source: *Mergent Database*, Jan. 2009.

Value Line Oil/Gas Distribution Industry (All)
Yield to Maturity for Long-Term Debt - January 1, 2009

Company Name	Ticker	Mergent Rating	Numerical Rating	YTM* 20+ Bonds	Risk Prem. Indicator
Adino Energy Corp	ADNY				
Boardwalk Pipeline	BWP	Baa2	11		
Buckeye Partners L.P.	BPL	Baa2	11	5.78	11.28
Clean Energy Fuels	CLNE				
El Paso Pipeline Partners L.P.	EPB				
Enbridge Energy Partners LLP	EEP	Baa2	11	9.84	15.34
Enbridge Inc.	ENB.TO	Baa1	10		
Energy Transfer	ETP	Baa3	12	9.45	14.95
Kinder Morgan Energy	KMP	Baa2	11	9.35	14.85
Magellan Midstream	MMP				
Plains All Amer. Pipe.	PAA	Baa3	12	10.43	15.93
Rio Vista Energy Partners L.P.	RVEP				
Southern Union	SUG	Baa3	12	15.85	21.35
Spectra Energy	SE	Baa1	10	9.63	15.13
Suburban Propane	SPH				
TEPPCO Partners L.P.	TPP	Baa3	12	11.83	17.33
Williams Cos.	WMB	Baa3	12	7.89	13.39
	Average	Baa2	11	10.01	15.51
	Median	Baa2	11	9.63	15.13

* Yield to Maturity for bonds with 20+ years to maturity. Source: *Mergent Database*, Jan. 2009.

VL Natural Gas Diversified & Oil/Gas Distribution - Large Yield to Maturity for Long-Term Debt - January 1, 2009

Company Name	Ticker	Mergent Rating	Numerical Rating	YTM* 20+ Bonds	Risk Prem. Indicator
Chesapeake Energy	CHK	Ba3	15	6.61	12.11
Crosstex Energy	XTXI				
Crosstex Energy LP	XTEX				
Devon Energy	DVN	Baa1	10	7.02	12.52
Dynegy Inc. 'A'	DYN	B2	17		
EOG Resources	EOG	A3	9		
Eagle Rock Energy Partners Ltd	EROC				
El Paso Corp.	EP	Ba3	15	12.59	18.09
Enbridge Energy Partners LLP	EEP	Baa2	11	9.84	15.34
Enbridge Inc.	ENB.TO	Baa1	10		
Energen Corp.	EGN	Baa3	12	6.03	11.53
Energy Transfer	ETP	Baa3	12	9.45	14.95
Enterprise Products	EPD	Baa3	12	12.73	18.23
Equitable Resources	EQT	Baa1	10		
Kinder Morgan Energy	KMP	Baa2	11	9.35	14.85
MDU Resources	MDU	A2	8		
Magellan Midstream	MMP				
National Fuel Gas	NFG	Baa1	10		
Newfield Exploration	NFX	Ba3	15		
ONEOK Inc.	OKE	Baa2	11	8.85	14.35
ONEOK Partners LP	OKS	Baa2	11	9.21	14.71
Penn Virginia Corp.	PVA				
Plains All Amer. Pipe.	PAA	Baa3	12	10.43	15.93
Questar Corp.	STR	A3	9	6.04	11.54
Southern Union	SUG	Baa3	12	15.85	21.35
Southwestern Energy	SWN	Ba2	14		
Spectra Energy	SE	Baa1	10	9.63	15.13
Suburban Propane	SPH				
TEPPCO Partners L.P.	TPP	Baa3	12	11.83	17.33
Williams Cos.	WMB	Baa3	12	7.89	13.39
XTO Energy	XTO	Baa2	11	7.45	12.95
	Average	Baa3	12	9.46	14.96
	Median	Baa2	11	9.35	14.85

* Yield to Maturity for bonds with 20+ years to maturity. Source: *Mergent Database*, Jan. 2009.

Interstate Natural Gas Pipeline Forum (Pipelines)
Yield to Maturity for Long-Term Debt - January 1, 2009

Company Name	Ticker	Mergent Rating	Numerical Rating	YTM* 20+ Bonds	Risk Prem. Indicator
Boardwalk Pipeline	BWP	Baa2	11		
CenterPoint Energy	CNP	Baa3	12	10.01	15.51
El Paso Corp.	EP	Ba3	15	12.59	18.09
Kinder Morgan Energy	KMP	Baa2	11	9.35	14.85
MDU Resources	MDU	A2	8		
National Fuel Gas	NFG	Baa1	10		
ONEOK Partners LP	OKS	Baa2	11	9.21	14.71
Questar Corp.	STR	A3	9	6.04	11.54
Southern Union	SUG	Baa3	12	15.85	21.35
Spectra Energy	SE	Baa1	10	9.63	15.13
TransCanada Corp.	TRP	A3	9	7.47	12.97
Williams Cos.	WMB	Baa3	12	7.89	13.39
	Average	Baa2	11	10.02	15.52
	Median	Baa2	11	9.49	14.99

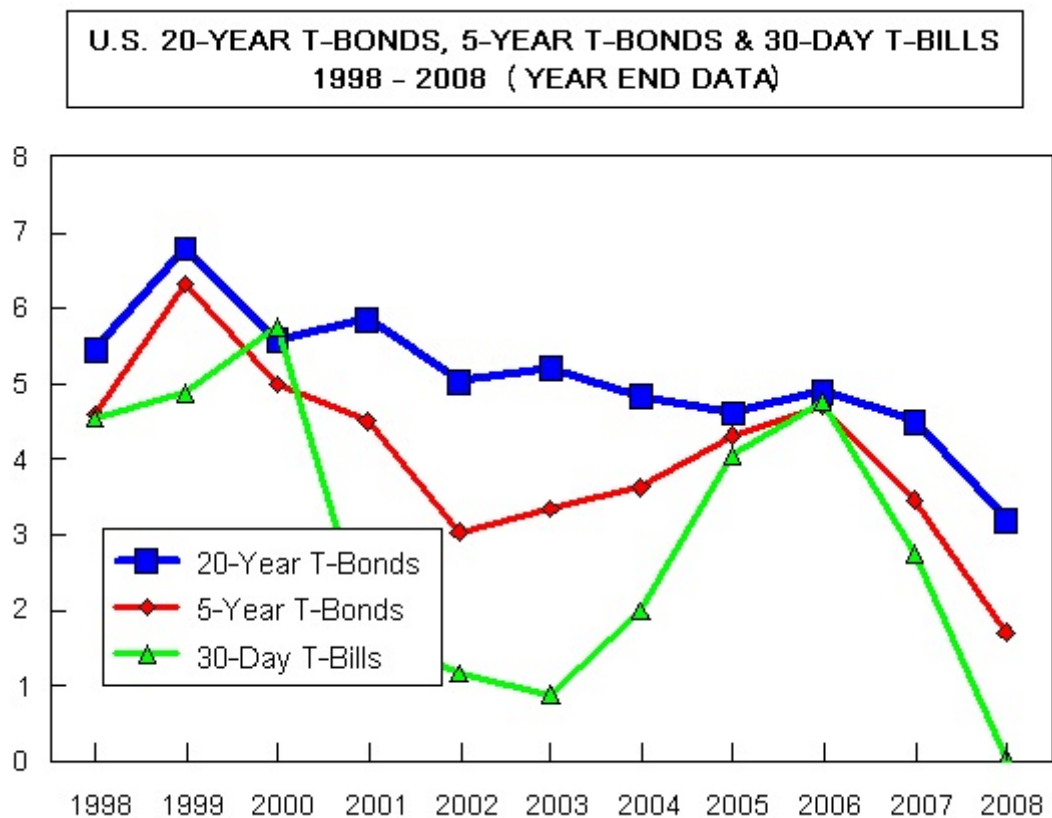
* Yield to Maturity for bonds with 20+ years to maturity. Source: *Mergent Database*, Jan. 2009.

Pipeline Screened Comparables Group
Yield to Maturity for Long-Term Debt - January 1, 2009

Company Name	Ticker	Mergent Rating	Numerical Rating	YTM* 20+ Bonds	Risk Prem. Indicator
Burlington Northern	BNI	Baa1	10	7.20	12.70
CenterPoint Energy	CNP	Ba1	13		
Constellation Energy	CEG	Baa3	12	7.80	13.30
Embarq Corp.	EQ	Baa3	12	12.91	18.41
Int'l Speedway 'A'	ISCA	Baa2	11		
Rayonier Inc.	RYN				
Seacor Holdings	CKH				
U.S. Cellular	USM				
	Average	Baa3	12	9.30	14.80
	Median	Baa3	12	7.80	13.30

* Yield to Maturity for bonds with 20+ years to maturity. Source: *Mergent Database*, Jan. 2009.

US 20-Year T-Bonds, 5-Year T-Bonds, and 30-Day T-Bills



Year End Date	20-Year T-Bonds	5 -Year T-Bonds	30-DAY T-Bills
1998	5.47	4.59	4.54
1999	6.80	6.33	4.89
2000	5.58	4.98	5.76
2001	5.86	4.52	1.70
2002	5.05	3.05	1.18
2003	5.21	3.36	0.88
2004	4.84	3.64	1.99
2005	4.62	4.30	4.05
2006	4.91	4.70	4.75
2007	4.50	3.45	2.76
2008	3.22	1.72	0.04

Source: WSJ, first issue of each respective year & Fed. Reserve

Capital Asset Pricing Model

The capital asset pricing model (CAPM) is a generally accepted method of estimating the cost of equity (K_e) based on the formula shown in Figure 4. It is the preferred method of

$$K_e = R_f + \beta R_p$$

where

K_e = Cost of equity
 R_f = Risk free rate
 β = Beta
 R_p = Risk premium

Figure 4

estimating the cost of equity by many analysts (*it is recommended by Morningstar in their SBBI publication*).

The CAPM method is much like the risk premium method, however the risk premium is adjusted by beta before it is added to the appropriate risk level. The two elements of risk are a risk free rate, which is the price of time (the reward for postponing consumption and for not exposing funds to risk), and a risk premium, which is the additional compensation for assuming risk. The nominal risk free rate includes the real risk free rate and an inflation premium. The risk premium includes an interest rate risk, business risk, financial risk, and liquidity risk.

All of these elements are accounted for when we calculate the cost of equity using the CAPM method.

Our *ex post* CAPM calculations were based upon the long-term risk premium using the entire period data provided by Morningstar, which includes data from 1926 through 2008. The indicated cost of equity by this method was 10.05% at January 1, 2009. Our *ex ante* CAPM calculations were based upon the expected risk premium of 10.22% derived from the market-weighted average of the cost of equity capital less the current long-term Treasury bond rate. The indicated cost of equity by this method was 13.95% at January 1, 2009.

Our 'safe rates' for the CAPM calculations were derived as described in the risk premium method discussed earlier. Our beta estimate of 1.05 was based on observing the average and median betas from each of the groups. The average and median betas are shown in Figure 5. The calculated forward-

Group of Companies	Avg.	Med.
Value Line Betas		
VL Nat Gas Diver. (all)	1.18	1.15
VL Oil/Gas Dist. (all)	0.91	0.85
VL Nat Gas Diver & Oil/Gas Dist. (large)	1.05	1.05
Nat Gas PL Forum (pipes)	1.02	0.95
S&P 500 BBB- rated debt	1.11	1.08

Figure 5 - Value Line Betas

looking (*ex ante*) CAPM indicator was found by deriving an expected risk premium from the S&P 500 companies. The *ex ante* CAPM indicator is a good check on the reliability of the

standard CAPM because it is forward looking. All prospective investment in interstate natural gas pipeline companies is based on an expectation of future benefits. This is consistent with the fundamental principle underlying the income approach, which is the principle of anticipation. Further, this ex ante method is discussed in the *Cost of Capital* as follows:

“The ex ante risk premium is a forward looking premium. The Gordon Growth Model is applied to determine the resulting risk premium. The premium is determined by first estimating the cost of equity for the proxy market. The proxy market is a market large enough to remove the effects of non-diversification. Typically, the S&P 500 or the NYSE is used as this proxy...

The first step in deriving the ex ante risk premium is to use a single-stage discounted cash flow analysis (otherwise known as the Gordon Growth Model) to calculate the cost of equity for the market proxy, (i.e., the S&P 500). The cost of equity is calculated by using the most recent I/B/E/S consensus long-term growth rates for each firm in the S&P 500 and adding it to the dividend growth yield. I/B/E/S is a service that polls analysts about their growth estimates for individual stocks. The dividend yield for the S&P 500 should be an estimate for Year 1's dividend (D_1). D_1 can be estimated by multiplying the S&P 500's current weighted average dividend yield (DY) by 1 plus its weighted average long-term earnings growth rate. By adding the weighted average long-term growth rate to the dividend yield at the end of Year 1, the cost of equity is estimated. If for example, the long-term growth rate is equal to 10% and the current dividend yield is 4%, then the cost of equity is $(4\% \times 1.1) + 10\%$, or 14.40 %. This can also be described in the following formula:

$$K_{e500} = DY \times (1 + g) + g$$

Where:	DY	=	dividend yield
	G	=	long-term growth
	K_{e500}	=	cost of equity for the S&P 500

The second step is to calculate the risk premium of the S&P 500 (RP_{500}). For the CAPM, the ex ante risk premium is calculated by subtracting the risk-free rate (R_f), from the cost of equity for the S&P 500. For the build up method, the ex ante risk premium is calculated by subtracting the weighted average bond yield for the S&P 500 from the cost of equity for the S&P 500.”³⁹

³⁹ Pratt, Shannon P. *Cost of Capital, Estimation and Applications*, (NY: John Wiley & Sons, Inc. 1998) p. 178.

$$RP_{500} = K_{e500} - R_f$$

In order to perform the *ex ante* CAPM indicator we derived the expected cost of equity for the companies making up the S&P 500 (which are expected to pay dividends). We developed the weighted average cost of capital (weighted by market value) for the S&P 500, which was 13.44%. We then subtracted the current long-term Treasury bond rate of 3.22% to obtain the expected equity risk premium of 10.22%. The market-weighted average is appropriate because the monthly fundamental beta is estimated based upon the sensitivity of a company's stock price to the overall fluctuation in the Standard & Poor's 500 (S&P 500) Index Price (with the S&P 500 being the surrogate for the market in general). The market-weighted average gives most weight to the highest market value stocks and is a very good indicator of the central tendency of the overall market cost of capital.

The general CAPM indicator, using the risk premium from *SBBI* published by Morningstar and the pipeline industry beta of 1.05, indicates a cost of equity capital of 10.05%. To help determine the reasonableness of the general historical or *ex post* indicator we also computed an *ex ante* or forward-looking CAPM indicator. The *ex ante* CAPM indication of the cost of equity was 13.95%.

Based upon the analysis presented and considering all the relevant facts we believe the appropriate cost of equity capital indicated by the CAPM method is **11.00%** of January 1, 2009. This conclusion gives weight and consideration to both indicators. A summary of the CAPM indicators and the supporting data begins below and on the following page.

Summary of CAPM Indicators - January 1, 2009

Item	Rates			CAPM Indicator
	Rf	Rp	Beta	
CAPM Indicator *				
Long-Term Gov't Bonds (ex post)	3.22	6.50	1.05	10.05
Long-Term Gov't Bonds (ex ante)	3.22	10.22	1.05	13.95

CAPM Formula: $K_e = R_f + B(R_p)$

* CAPM Indicator is based upon a *Value Line* beta of 1.05. Morningstar, 2009 *SBBI & Risk Premia over Time Report*, & Federal Reserve data December 31, 2007.

Correlation of the *ex post* and *ex ante* CAPM indicators using long-term government bonds as the 'safe rate' indicates a cost of equity of 11.00% for the Interstate Natural Gas Pipelines as of January 1, 2009.

Beginning on the following page are the *Value Line* betas for the various companies in the Natural Gas Diversified Industry (all), Natural Gas Diversified Industry (large), and the Interstate Natural Gas Pipeline Forum (Pipeline) groups. Shown after the betas for the various groups are the calculations for the ex ante CAPM with supporting data from *Standard & Poor's Compustat*.

Value Line Natural Gas Diversified Ind. (All)

Beta (Value Line) - January 1, 2009

Company Name	Ticker	Beta
ATP Oil & Gas Corp	ATPG	1.60
Cabot Oil & Gas 'A'	COG	1.25
Callon Pete Co	CPE	1.40
Chesapeake Energy	CHK	1.40
Crosstex Energy	XTXI	1.15
Crosstex Energy LP	XTEX	0.85
Delta Natural Gas	DGAS	0.60
Devon Energy	DVN	1.15
Dynegy Inc. 'A'	DYN	1.60
EOG Resources	EOG	1.15
Eagle Rock Energy Partners Ltd	EROC	0.90
El Paso Corp.	EP	1.35
Energen Corp.	EGN	1.15
Enterprise Products	EPD	0.85
Equitable Resources	EQT	1.15
MDU Resources	MDU	1.05
Markwest Energy Partners LP	MWE	0.80
National Fuel Gas	NFG	0.90
Newfield Exploration	NFX	1.35
ONEOK Inc.	OKE	0.90
ONEOK Partners LP	OKS	0.85
Penn Virginia Corp.	PVA	1.40
Petroleum Development Corp.	PETD	1.50
Quest Resource Corp	QRCP	1.45
Questar Corp.	STR	1.25
Quicksilver Res.	KWK	1.60
Southwestern Energy	SWN	1.30
XTO Energy	XTO	1.10
Average		1.18
Median		1.15

Source: *Value Line* CD Rom, January 2009.

Value Line Oil/Gas Distribution Industry (All)
Beta (Value Line) - January 1, 2009

Company Name	Ticker	Beta
Adino Energy Corp	ADNY	1.35
Boardwalk Pipeline	BWP	0.95
Buckeye Partners L.P.	BPL	0.90
Clean Energy Fuels	CLNE	
El Paso Pipeline Partners L.P.	EPB	
Enbridge Energy Partners LLP	EEP	0.80
Enbridge Inc.	ENB.TO	0.65
Energy Transfer	ETP	0.85
Kinder Morgan Energy	KMP	0.75
Magellan Midstream	MMP	0.85
Plains All Amer. Pipe.	PAA	0.95
Rio Vista Energy Partners L.P.	RVEP	0.70
Southern Union	SUG	1.10
Spectra Energy	SE	0.95
Suburban Propane	SPH	0.80
TEPPCO Partners L.P.	TPP	0.85
Williams Cos.	WMB	1.25
Average		0.91
Median		0.85

Source: *Value Line* CD Rom, January 2009.

**VL Natural Gas Divers. & Oil/Gas Distribution - Large
Beta (Value Line) - January 1, 2009**

Company Name	Ticker	Beta
Chesapeake Energy	CHK	1.40
Crosstex Energy	XTXI	1.15
Crosstex Energy LP	XTEX	0.85
Devon Energy	DVN	1.15
Dynegy Inc. 'A'	DYN	1.60
EOG Resources	EOG	1.15
Eagle Rock Energy Partners Ltd	EROC	0.90
El Paso Corp.	EP	1.35
Enbridge Energy Partners LLP	EEP	0.80
Enbridge Inc.	ENB.TO	0.65
Energen Corp.	EGN	1.15
Energy Transfer	ETP	0.85
Enterprise Products	EPD	0.85
Equitable Resources	EQT	1.15
Kinder Morgan Energy	KMP	0.75
MDU Resources	MDU	1.05
Magellan Midstream	MMP	0.85
National Fuel Gas	NFG	0.90
Newfield Exploration	NFX	1.35
ONEOK Inc.	OKE	0.90
ONEOK Partners LP	OKS	0.85
Penn Virginia Corp.	PVA	1.40
Plains All Amer. Pipe.	PAA	0.95
Questar Corp.	STR	1.25
Southern Union	SUG	1.10
Southwestern Energy	SWN	1.30
Spectra Energy	SE	0.95
Suburban Propane	SPH	0.80
TEPPCO Partners L.P.	TPP	0.85
Williams Cos.	WMB	1.25
XTO Energy	XTO	1.10
Average		1.05
Median		1.05

Source: *Value Line* CD Rom, January 2009.

Interstate Nat. Gas PL Forum (Pipelines)
Beta (Value Line) - January 1, 2009

Company Name	Ticker	Beta
Boardwalk Pipeline	BWP	0.95
CenterPoint Energy	CNP	0.90
El Paso Corp.	EP	1.35
Kinder Morgan Energy	KMP	0.75
MDU Resources	MDU	1.05
National Fuel Gas	NFG	0.90
ONEOK Partners LP	OKS	0.85
Questar Corp.	STR	1.25
Southern Union	SUG	1.10
Spectra Energy	SE	0.95
TransCanada Corp.	TRP	0.90
Williams Cos.	WMB	1.25
Average		1.02
Median		0.95

Source: *Value Line* CD Rom, January 2009.

All Companies in S&P 500 with "BBB-" Rated Debt
Beta (Value Line) - January 1, 2009

Company Name	Ticker	Beta
Agilent Technologies	A	1.15
Allegheny Energy	AYE	1.10
Allegheny Techn.	ATI	1.85
Ameren Corp.	AEE	0.80
Amphenol Corp.	APH	1.25
Anadarko Petroleum	APC	1.30
Best Buy Co.	BBY	1.15
Big Lots Inc.	BIG	1.05
CMS Energy Corp.	CMS	0.95
CSX Corp.	CSX	1.15
CenturyTel Inc.	CTL	0.75
Coventry Health Care	CVH	1.15
Developers Div. R'Ity	DDR	1.50
Discover Fin'l Svcs.	DFS	
Dr Pepper Snapple	DPS	
Edison Int'l	EIX	0.80
Embarq Corp.	EQ	0.90
Freep't-McMoRan C&G	FCX	1.80
Gannett Co.	GCI	1.00
Hess Corp.	HES	1.30
Janus Capital Group	JNS	1.75
Kroger Co.	KR	0.70
L-3 Communic.	LLL	0.90
Life Technologies	LIFE	0.95
Macy's Inc.	M	1.25
Marsh & McLennan	MMC	0.75
Mattel Inc.	MAT	0.85
Nasdaq OMX Group	NDAQ	1.25
National Semic.	NSM	1.05
NiSource Inc.	NI	0.75
Noble Energy	NBL	1.35
Penney (J.C.)	JCP	1.15
Pinnacle West Capital	PNW	0.70
Plum Creek Timber	PCL	0.95
Prologis	PLD	1.55
SLM Corporation	SLM	1.35
Sealed Air	SEE	0.70
TECO Energy	TE	0.75
Unum Group	UNM	1.20
Watson Pharmac.	WPI	0.80
Williams Cos.	WMB	1.25
Wyndham Worlwide	WYN	1.90
Xilinx Inc.	XLNX	0.90
Yum! Brands	YUM	0.90
Average		1.11
Median		1.08

Source: *Value Line* CD Rom, January 2009.

Cost of Equity Indication Using Expected Risk Premium

Weighted Average Cost of Equity for S&P 500 = Market Required Cost of Equity

CAPM Calculations:

							Cost of Equity by CAPM
S&P 500 Expected Equity Cost (Wt. Avg)	13.44		LT Gov't.				
Current Yield on L-T Gov't. Bonds	3.22		Bond Yield				
Expected Equity Risk Premium	<u>10.22</u>						
Beta	1.05						
Adjusted Risk Premium	<u>10.73</u>	+	3.22	=	13.95		<i>Ex Ante</i>

Note: Forward-looking CAPM (Ex Ante) uses the weighted average expected return on the S&P 500 as the expected market return. The current US Government bond yield is deducted from the weighted average expected return to obtain the expected risk premium. The current beta is applied to the expected risk premium and the result is added to the current US Government bond yield to obtain the indicated cost of equity by the CAPM method.

(Calculations for expected market return for S&P 500 can be found on the following pages.)

Source: *Standard & Poor's Compustat* (January 2009)

Standard & Poor's Compustat & I/B/E/S (S&P 500) - Jan. 1, 2009

Company Name	Expected Dividend	Recent Price	Yield %	Growth Rate %	Equity Cost %	Market Value
3M CO	2.22	57.54	3.86	11.00	14.86	39,872.63
ABBOTT LABORATORIES	1.63	53.37	3.05	13.00	16.05	82,807.93
ABERCROMBIE & FITCH -CL A	0.80	23.07	3.49	15.00	18.49	2,008.31
AETNA INC	0.05	28.50	0.16	15.00	15.16	13,141.35
AFLAC INC	1.10	45.84	2.41	15.00	17.41	21,367.08
AIR PRODUCTS & CHEMICALS INC	1.93	50.27	3.85	9.94	13.78	10,535.84
ALCOA INC	0.84	11.26	7.49	23.95	31.44	9,011.57
ALLEGHENY ENERGY INC	0.73	33.86	2.15	21.50	23.65	5,724.17
ALLERGAN INC	0.23	40.32	0.57	15.00	15.57	12,253.53
ALLSTATE CORP	1.77	32.76	5.41	8.00	13.41	17,558.12
ALTERA CORP	0.23	16.71	1.38	15.00	16.38	4,968.99
ALTRIA GROUP INC	1.40	15.06	9.26	9.00	18.26	31,029.59
AMEREN CORP	2.64	33.26	7.94	4.00	11.94	7,032.93
AMERICAN ELECTRIC POWER CO	1.72	33.28	5.17	5.00	10.17	13,430.31
AMERICAN EXPRESS CO	0.80	18.55	4.33	11.50	15.83	21,516.00
AMERIPRISE FINANCIAL INC	0.76	23.36	3.25	11.50	14.75	5,059.73
AMERISOURCEBERGEN CORP	0.44	35.66	1.25	11.00	12.25	5,562.96
AMPHENOL CORP	0.07	23.98	0.30	20.00	20.30	4,215.20
ANADARKO PETROLEUM CORP	0.38	38.55	0.99	6.00	6.99	17,695.99
ANALOG DEVICES	0.90	19.02	4.73	12.50	17.23	5,538.49
AON CORP	0.66	45.68	1.45	10.50	11.95	12,323.64
APACHE CORP	0.66	74.53	0.88	9.50	10.38	24,942.96
APARTMENT INVT &MGMT -CL A	2.50	11.55	21.61	4.00	25.61	1,023.92
APPLIED MATERIALS INC	0.26	10.13	2.61	10.00	12.61	13,461.46
ARCHER-DANIELS-MIDLAND CO	0.58	28.83	2.01	11.65	13.66	18,493.70
ASSURANT INC	0.62	30.00	2.08	11.50	13.58	3,528.51
AT&T INC	1.71	28.50	6.01	7.00	13.01	167,950.50
AUTOMATIC DATA PROCESSING	1.50	39.34	3.83	14.00	17.83	19,979.96
AVALONBAY COMMUNITIES INC	3.61	60.58	5.95	1.00	6.95	4,671.44
AVERY DENNISON CORP	1.77	32.73	5.41	8.00	13.41	3,478.74
AVON PRODUCTS	0.90	24.03	3.76	13.00	16.76	10,243.92
BAKER HUGHES INC	0.62	32.07	1.95	4.00	5.95	9,862.52
BALL CORP	0.44	41.59	1.05	8.80	9.85	3,934.00
BANK OF AMERICA CORP	1.37	14.08	9.73	7.00	16.73	70,647.52
BANK OF NEW YORK MELLON CORP	1.06	28.33	3.73	10.00	13.73	32,537.20
BARD (C.R.) INC	0.73	84.26	0.87	14.50	15.37	8,358.59
BAXTER INTERNATIONAL INC	1.18	53.59	2.19	13.00	15.19	33,234.96
BB&T CORP	1.97	27.46	7.19	5.00	12.19	15,171.29
BECTON DICKINSON & CO	1.48	68.39	2.16	12.00	14.16	16,480.96
BEMIS CO INC	0.94	23.68	3.98	7.00	10.98	2,360.26
BEST BUY CO INC	0.63	28.11	2.25	13.00	15.25	11,590.65
BJ SERVICES CO	0.21	11.67	1.83	7.00	8.83	3,407.91
BLACK & DECKER CORP	1.79	41.81	4.28	6.50	10.78	2,512.49
BLOCK H & R INC	0.67	22.72	2.96	12.00	14.96	7,700.83
BOEING CO	1.76	42.67	4.12	10.00	14.12	30,075.27
BOSTON PROPERTIES INC	2.86	55.00	5.19	5.00	10.19	6,644.27
BRISTOL-MYERS SQUIBB CO	1.37	23.25	5.88	10.20	16.08	46,025.98
BROWN-FORMAN -CL B	1.23	51.49	2.38	6.63	9.01	7,684.77
BURLINGTON NORTHERN SANTA FE	1.78	75.71	2.35	11.00	13.35	25,917.50
C H ROBINSON WORLDWIDE INC	1.10	55.03	2.01	15.00	17.01	9,311.30

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Company Name	Expected Dividend	Recent Price	Yield %	Growth Rate %	Equity Cost %	Market Value
CA INC	0.18	18.53	0.97	12.00	12.97	9,603.86
CABOT OIL & GAS CORP	0.13	26.00	0.50	8.00	8.50	2,687.15
CAMPBELL SOUP CO	1.08	30.01	3.59	7.75	11.34	10,783.73
CAPITAL ONE FINANCIAL CORP	1.67	31.89	5.22	11.00	16.22	12,489.97
CARDINAL HEALTH INC	0.63	34.47	1.84	13.00	14.84	12,395.83
CATERPILLAR INC	1.86	44.67	4.17	11.00	15.17	26,946.46
CBS CORP	1.11	8.19	13.52	2.50	16.02	5,568.71
CENTERPOINT ENERGY INC	0.86	12.62	6.83	18.00	24.83	4,343.31
CENTURYTEL INC	2.97	27.33	10.86	6.00	16.86	2,738.74
CF INDUSTRIES HOLDINGS INC	0.41	49.16	0.84	3.50	4.34	2,795.24
CHESAPEAKE ENERGY CORP	0.32	16.17	2.00	8.00	10.00	9,792.15
CHEVRON CORP	2.79	73.97	3.78	7.50	11.28	150,291.58
CHUBB CORP	1.43	51.00	2.80	8.00	10.80	18,140.80
CINCINNATI FINANCIAL CORP	1.72	29.07	5.90	10.00	15.90	4,720.47
CINTAS CORP	0.51	23.23	2.19	10.50	12.69	3,549.27
CIT GROUP INC	0.45	4.54	9.91	12.50	22.41	1,713.37
CITIGROUP INC	0.67	6.71	10.01	5.00	15.01	36,566.41
CLOROX CO/DE	2.02	55.56	3.64	10.00	13.64	7,706.89
CME GROUP INC	5.29	208.11	2.54	15.00	17.54	13,939.42
CMS ENERGY CORP	0.38	10.11	3.79	6.50	10.29	2,286.96
COCA-COLA CO	1.65	45.27	3.66	8.86	12.51	104,734.63
COCA-COLA ENTERPRISES INC	0.29	12.03	2.40	3.19	5.60	5,869.83
COLGATE-PALMOLIVE CO	1.78	68.54	2.59	11.00	13.59	34,593.17
COMCAST CORP	0.27	16.88	1.62	9.50	11.12	47,859.77
COMERICA INC	1.39	19.85	6.99	5.10	12.09	2,987.15
CONAGRA FOODS INC	0.84	16.50	5.10	10.75	15.85	7,377.28
CONOCOPHILLIPS	2.01	51.80	3.88	7.00	10.88	77,224.38
CONSOL ENERGY INC	0.53	28.58	1.85	32.00	33.85	5,178.52
CONSOLIDATED EDISON INC	2.39	38.93	6.13	2.00	8.13	10,652.42
CONSTELLATION ENERGY GRP INC	2.18	25.09	8.67	13.90	22.57	4,997.23
COOPER INDUSTRIES LTD	1.10	29.23	3.76	10.00	13.76	5,065.97
CORNING INC	0.23	9.53	2.36	12.50	14.86	14,812.74
COSTCO WHOLESALE CORP	0.72	52.50	1.38	13.00	14.38	22,745.31
COVIDIEN LTD	0.70	36.24	1.94	10.00	11.94	18,249.63
CSX CORP	1.01	32.47	3.12	15.00	18.12	12,808.41
CUMMINS INC	0.78	26.73	2.93	12.00	14.93	5,382.67
CVS CAREMARK CORP	0.31	28.74	1.09	14.00	15.09	41,277.19
D R HORTON INC	0.16	7.07	2.23	5.00	7.23	2,238.77
DANAHER CORP	0.13	56.61	0.24	12.50	12.74	18,093.12
DARDEN RESTAURANTS INC	0.90	28.18	3.18	12.00	15.18	3,909.27
DEERE & CO	1.23	38.32	3.22	10.00	13.22	16,182.84
DENTSPLY INTERNATL INC	0.23	28.24	0.81	15.00	15.81	4,206.40
DEVON ENERGY CORP	0.68	65.71	1.04	6.50	7.54	29,010.96
DISCOVER FINANCIAL SVCS INC	0.25	9.53	2.67	6.00	8.67	4,574.28
DISNEY (WALT) CO	0.38	22.69	1.68	9.05	10.73	41,999.80
DOMINION RESOURCES INC	1.69	35.84	4.72	7.00	11.72	20,835.26
DONNELLEY (R R) & SONS CO	1.16	13.58	8.58	12.00	20.58	2,783.90
DOVER CORP	1.17	32.92	3.55	17.00	20.55	6,121.97
DOW CHEMICAL	1.80	15.09	11.91	7.00	18.91	13,939.84
DTE ENERGY CO	2.19	35.67	6.15	3.50	9.65	5,815.10

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DU PONT (E I) DE NEMOURS	1.73	25.30	6.82	5.26	12.08	22,829.73
DUKE ENERGY CORP	0.96	15.01	6.43	4.88	11.30	18,991.99
EASTMAN CHEMICAL CO	1.88	31.71	5.94	7.00	12.94	2,300.37
EATON CORP	2.23	49.71	4.49	11.50	15.99	8,197.18
ECOLAB INC	0.63	35.15	1.80	13.00	14.80	8,300.11
EDISON INTERNATIONAL	1.33	32.12	4.13	7.00	11.13	10,465.05
EL PASO CORP	0.22	7.83	2.76	8.00	10.76	5,469.75
EMBARQ CORP	2.83	35.96	7.88	3.00	10.88	5,111.14
EMERSON ELECTRIC CO	1.47	36.61	4.00	11.00	15.00	27,979.60
ENSCO INTERNATIONAL INC	0.11	28.39	0.39	10.00	10.39	4,026.33
ENTERGY CORP	3.30	83.13	3.97	10.00	13.97	15,739.00
EOG RESOURCES INC	0.59	66.58	0.89	10.00	10.89	16,617.10
EQUIFAX INC	0.18	26.52	0.67	10.50	11.17	3,349.69
EQUITABLE RESOURCES INC	0.98	33.55	2.91	11.00	13.91	4,387.43
EXELON CORP	2.27	55.61	4.08	8.00	12.08	36,587.04
EXPEDITORS INTL WASH INC	0.37	33.27	1.11	15.00	16.11	7,054.97
EXXON MOBIL CORP	1.71	79.83	2.14	7.00	9.14	406,067.19
FAMILY DOLLAR STORES	0.56	26.07	2.14	11.50	13.64	3,647.51
FASTENAL CO	0.62	34.85	1.78	15.00	16.78	5,176.31
FEDERATED INVESTORS INC	1.06	16.96	6.23	10.00	16.23	1,726.58
FEDEX CORP	0.51	64.15	0.79	15.00	15.79	19,969.38
FIDELITY NATIONAL INFO SVCS	0.23	16.27	1.41	15.00	16.41	3,091.22
FIFTH THIRD BANCORP	0.04	8.26	0.51	5.00	5.51	4,769.63
FIRSTENERGY CORP	2.40	48.58	4.94	9.00	13.94	14,808.88
FLOWERVE CORP	1.08	51.50	2.10	8.00	10.10	2,911.86
FLUOR CORP	0.57	44.87	1.28	15.00	16.28	8,144.17
FORTUNE BRANDS INC	1.95	41.28	4.73	11.00	15.73	6,188.16
FPL GROUP INC	1.96	50.33	3.89	10.00	13.89	20,571.23
FRANKLIN RESOURCES INC	0.93	63.78	1.46	11.00	12.46	14,841.92
FRONTIER COMMUNICATIONS CORP	1.02	8.74	11.65	1.86	13.51	2,720.90
GANNETT CO	1.65	8.00	20.60	3.00	23.60	1,824.93
GAP INC	0.38	13.39	2.84	12.00	14.84	9,459.81
GENERAL DYNAMICS CORP	1.54	57.59	2.67	10.00	12.67	22,451.35
GENERAL ELECTRIC CO	1.36	16.20	8.42	10.00	18.42	161,278.39
GENERAL MILLS INC	1.87	60.75	3.08	8.75	11.83	19,917.01
GENUINE PARTS CO	1.68	37.86	4.45	8.00	12.45	6,036.25
GOLDMAN SACHS GROUP INC	1.55	84.39	1.84	11.00	12.84	37,312.36
GOODRICH CORP	1.13	37.02	3.05	13.00	16.05	4,557.13
GRAINGER (W W) INC	1.79	78.84	2.27	12.00	14.27	5,997.20
HALLIBURTON CO	0.41	18.18	2.28	15.00	17.28	16,248.47
HARLEY-DAVIDSON INC	1.45	16.97	8.56	10.00	18.56	3,951.02
HARMAN INTERNATIONAL INDS	0.06	16.73	0.37	22.50	22.87	979.47
HARRIS CORP	0.92	38.05	2.42	15.00	17.42	5,121.23
HARTFORD FINANCIAL SERVICES	1.41	16.42	8.57	10.00	18.57	4,935.38
HASBRO INC	0.88	29.17	3.02	10.00	13.02	4,060.46
HCP INC	2.01	27.77	7.24	10.50	17.74	7,016.17
HEINZ (H J) CO	1.78	37.60	4.72	7.00	11.72	11,822.94
HERSHEY CO	1.23	34.74	3.55	3.75	7.30	5,780.53
HESS CORP	0.43	53.64	0.80	7.00	7.80	17,490.29
HEWLETT-PACKARD CO	0.36	36.29	0.98	11.50	12.48	87,683.94

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HOME DEPOT INC	1.00	23.02	4.34	11.00	15.34	39,029.44
HONEYWELL INTERNATIONAL INC	1.22	32.83	3.70	10.50	14.20	23,844.00
HUDSON CITY BANCORP INC	0.60	15.96	3.75	15.00	18.75	8,319.09
HUNTINGTON BANCSHARES	0.56	7.66	7.27	5.00	12.27	2,803.94
ILLINOIS TOOL WORKS	1.37	35.05	3.91	10.50	14.41	17,916.26
IMS HEALTH INC	0.13	15.16	0.87	10.50	11.37	2,757.19
INGERSOLL-RAND CO LTD	0.81	17.35	4.69	13.00	17.69	5,530.94
INTEGRYS ENERGY GROUP INC	2.98	42.98	6.93	11.10	18.03	3,284.66
INTEL CORP	0.62	14.66	4.20	10.00	14.20	81,538.92
INTL BUSINESS MACHINES CORP	2.20	84.16	2.61	10.00	12.61	113,065.42
INTL GAME TECHNOLOGY	0.66	11.89	5.55	13.80	19.35	3,503.98
INTL PAPER CO	1.05	11.80	8.90	5.00	13.90	5,044.85
INVESCO LTD	0.45	14.44	3.10	12.00	15.10	5,558.94
ITT CORP	0.79	45.99	1.71	12.50	14.21	8,351.28
JABIL CIRCUIT INC	0.34	6.75	4.98	20.00	24.98	1,421.17
JANUS CAPITAL GROUP INC	0.04	8.03	0.55	10.00	10.55	1,267.57
JOHNSON & JOHNSON	2.01	59.83	3.35	9.00	12.35	166,002.41
JOHNSON CONTROLS INC	0.58	18.16	3.21	12.00	15.21	10,790.67
JONES APPAREL GROUP INC	0.62	5.86	10.51	10.00	20.51	488.88
JPMORGAN CHASE & CO	1.66	31.53	5.25	9.00	14.25	117,681.25
KB HOME	0.28	13.62	2.04	11.00	13.04	1,056.95
KELLOGG CO	1.48	43.85	3.38	9.00	12.38	16,737.54
KEYCORP	0.26	8.52	3.08	5.00	8.08	4,217.47
KIMBERLY-CLARK CORP	2.48	52.74	4.71	7.00	11.71	21,821.70
KIMCO REALTY CORP	1.90	18.28	10.40	8.00	18.40	4,867.67
KLA-TENCOR CORP	0.66	21.79	3.03	10.00	13.03	3,679.44
KRAFT FOODS INC	1.24	26.85	4.62	6.90	11.52	39,446.09
KROGER CO	0.39	26.41	1.49	9.00	10.49	17,231.31
L-3 COMMUNICATIONS HLDGS INC	1.32	73.78	1.79	10.00	11.79	8,809.26
LAUDER (ESTEE) COS INC -CL A	0.61	30.96	1.96	10.50	12.46	3,662.69
LEGG MASON INC	1.07	21.91	4.86	11.00	15.86	3,081.44
LEGGETT & PLATT INC	1.15	15.19	7.57	15.00	22.57	2,372.66
LENNAR CORP	0.17	8.67	1.96	6.00	7.96	1,323.54
LILLY (ELI) & CO	1.96	40.27	4.86	4.00	8.86	45,785.10
LIMITED BRANDS INC	0.68	10.04	6.81	14.00	20.81	3,234.13
LINCOLN NATIONAL CORP	1.86	18.84	9.87	12.00	21.87	4,820.80
LINEAR TECHNOLOGY CORP	0.97	22.12	4.37	15.00	19.37	4,904.65
LOCKHEED MARTIN CORP	2.51	84.08	2.98	10.00	12.98	33,683.12
LORILLARD INC	3.97	56.35	7.05	8.00	15.05	9,470.80
LOWE'S COMPANIES INC	0.38	21.52	1.77	12.00	13.77	31,622.54
M & T BANK CORP	2.90	57.41	5.05	3.45	8.50	6,335.31
MACY'S INC	0.58	10.35	5.61	9.50	15.11	4,352.83
MANITOWOC CO	0.09	8.66	1.01	9.50	10.51	1,128.84
MARATHON OIL CORP	1.05	27.36	3.82	9.00	12.82	19,304.56
MARRIOTT INTL INC	0.39	19.45	2.02	12.50	14.52	6,790.03
MARSH & MCLENNAN COS	0.88	24.27	3.63	10.00	13.63	12,476.70
MARSHALL & ILSLEY CORP	1.34	13.64	9.81	4.50	14.31	3,550.46
MASCO CORP	1.08	11.13	9.71	15.00	24.71	4,005.69
MASSEY ENERGY CO	0.45	13.79	3.24	86.00	89.24	1,174.01
MASTERCARD INC	0.71	142.93	0.50	18.00	18.50	14,062.17

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MATTEL INC	0.83	16.00	5.16	10.00	15.16	5,734.88
MCCORMICK & COMPANY INC	1.05	31.86	3.31	9.80	13.11	4,140.49
MCDONALD'S CORP	2.18	62.19	3.51	9.00	12.51	69,313.55
MCKESSON CORP	0.54	38.73	1.39	12.00	13.39	10,591.80
MEADWESTVACO CORP	1.02	11.19	9.08	10.50	19.58	1,911.39
MEDTRONIC INC	0.84	31.42	2.67	12.00	14.67	35,134.63
MERCK & CO	1.56	30.40	5.14	2.88	8.02	64,271.25
METLIFE INC	0.81	34.86	2.34	10.00	12.34	27,664.58
MICROCHIP TECHNOLOGY INC	1.47	19.53	7.53	8.50	16.03	3,552.33
MICROSOFT CORP	0.58	19.44	2.97	11.00	13.97	172,929.94
MOLEX INC	0.70	14.49	4.84	15.00	19.84	2,429.08
MOLSON COORS BREWING CO	0.90	48.92	1.83	12.00	13.83	7,769.18
MONSANTO CO	1.10	70.35	1.57	15.00	16.57	38,547.37
MOODY'S CORP	0.46	20.09	2.29	15.00	17.29	4,817.58
MORGAN STANLEY	1.21	16.04	7.56	12.30	19.86	16,828.41
MOTOROLA INC	0.22	4.43	4.97	10.00	14.97	10,039.90
MURPHY OIL CORP	1.15	44.35	2.58	14.60	17.18	8,448.01
NATIONAL SEMICONDUCTOR CORP	0.36	10.07	3.57	12.50	16.07	2,311.08
NEW YORK TIMES CO -CL A	0.25	7.33	3.37	3.00	6.37	1,061.85
NEWELL RUBBERMAID INC	0.91	9.78	9.32	8.50	17.82	2,711.02
NEWMONT MINING CORP	0.47	40.70	1.15	17.15	18.30	17,967.06
NEWS CORP	0.12	9.09	1.36	3.30	4.66	24,148.51
NICOR INC	1.91	34.74	5.51	2.85	8.36	1,569.94
NIKE INC -CL B	1.15	51.00	2.25	15.00	17.25	19,841.04
NISOURCE INC	0.95	10.97	8.64	3.00	11.64	3,008.45
NOBLE CORP	0.19	22.09	0.87	20.00	20.87	5,826.99
NOBLE ENERGY INC	0.79	49.22	1.61	10.00	11.61	8,502.51
NORDSTROM INC	0.71	13.31	5.34	11.00	16.34	2,866.80
NORFOLK SOUTHERN CORP	1.41	47.05	2.99	10.00	12.99	17,421.63
NORTHERN TRUST CORP	1.25	52.14	2.41	12.00	14.41	11,631.23
NORTHROP GRUMMAN CORP	1.76	45.04	3.91	10.00	13.91	14,725.47
NUCOR CORP	1.50	46.20	3.24	7.00	10.24	14,504.49
NYSE EURONEXT	1.38	27.38	5.04	15.00	20.04	7,255.70
OCCIDENTAL PETROLEUM CORP	1.41	59.99	2.34	9.90	12.24	48,584.52
OMNICOM GROUP	0.67	26.92	2.50	12.00	14.50	8,366.74
PACCAR INC	0.92	28.60	3.23	12.50	15.73	10,372.65
PALL CORP	0.58	28.43	2.03	11.00	13.03	3,356.99
PARKER-HANNIFIN CORP	1.12	42.54	2.63	12.00	14.63	6,855.45
PAYCHEX INC	1.43	26.28	5.43	15.00	20.43	9,482.32
PEABODY ENERGY CORP	0.36	22.75	1.59	51.00	52.59	6,065.90
PENNEY (J C) CO	0.89	19.70	4.51	11.00	15.51	4,377.02
PEOPLE'S UNITED FINL INC	0.66	17.83	3.70	10.00	13.70	6,200.90
PEPCO HOLDINGS INC	1.14	17.76	6.45	6.00	12.45	3,591.23
PEPSI BOTTLING GROUP INC	0.73	22.51	3.25	7.61	10.86	4,753.01
PEPSICO INC	1.85	54.77	3.37	8.65	12.03	85,064.44
PERKINELMER INC	0.32	13.91	2.31	15.00	17.31	1,642.87
PG&E CORP	1.67	38.71	4.31	7.00	11.31	13,973.69
PHILIP MORRIS INTERNATIONAL	2.41	43.51	5.54	11.50	17.04	88,022.21
PINNACLE WEST CAPITAL CORP	2.18	32.13	6.80	4.00	10.80	3,239.19
PIONEER NATURAL RESOURCES CO	0.35	16.18	2.19	10.50	12.69	1,904.22

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PLUM CREEK TIMBER CO INC	1.81	34.74	5.20	7.50	12.70	5,794.32
PNC FINANCIAL SVCS GROUP INC	2.88	49.00	5.87	9.00	14.87	17,050.04
POLO RALPH LAUREN CP -CL A	0.23	45.41	0.51	15.00	15.51	2,516.76
PPG INDUSTRIES INC	2.29	42.43	5.39	7.94	13.34	6,967.47
PPL CORP	1.50	30.69	4.89	12.00	16.89	11,495.77
PRAXAIR INC	1.66	59.36	2.79	10.50	13.29	18,306.45
PRECISION CASTPARTS CORP	0.14	59.48	0.23	15.00	15.23	8,293.30
PRICE (T. ROWE) GROUP	1.08	35.44	3.03	12.00	15.03	9,157.55
PRINCIPAL FINANCIAL GRP INC	0.50	22.57	2.22	11.50	13.72	5,853.30
PROCTER & GAMBLE CO	1.76	61.82	2.85	10.00	12.85	184,576.28
PROGRESS ENERGY INC	2.58	39.85	6.48	5.00	11.48	10,484.02
PROLOGIS	2.19	13.89	15.80	6.00	21.80	3,689.99
PRUDENTIAL FINANCIAL INC	0.66	30.26	2.19	14.00	16.19	12,769.72
PUBLIC SERVICE ENTRP GRP INC	1.37	29.17	4.69	6.00	10.69	14,762.79
PUBLIC STORAGE	2.84	79.50	3.57	29.00	32.57	13,677.08
PULTE HOMES INC	0.18	10.93	1.61	10.00	11.61	2,814.29
QUALCOMM INC	0.71	35.83	1.99	11.50	13.49	59,315.56
QUEST DIAGNOSTICS INC	0.46	51.91	0.88	14.00	14.88	10,154.01
QUESTAR CORP	0.54	32.69	1.65	8.00	9.65	5,669.59
QWEST COMMUNICATION INTL INC	0.33	3.64	9.01	2.50	11.51	6,200.47
RADIOSHACK CORP	0.28	11.94	2.31	10.50	12.81	1,493.36
RANGE RESOURCES CORP	0.18	34.39	0.54	15.00	15.54	5,342.00
RAYTHEON CO	1.23	51.04	2.41	10.00	12.41	21,133.98
REGIONS FINANCIAL CORP	0.43	7.96	5.38	7.00	12.38	5,507.97
REPUBLIC SERVICES INC	0.85	24.79	3.45	12.50	15.95	9,365.91
REYNOLDS AMERICAN INC	3.59	40.31	8.90	5.50	14.40	11,748.47
ROBERT HALF INTL INC	0.51	20.82	2.46	16.50	18.96	3,230.08
ROCKWELL AUTOMATION	1.31	32.24	4.07	13.00	17.07	4,570.37
ROCKWELL COLLINS INC	1.08	39.09	2.75	12.00	14.75	6,181.69
ROHM AND HAAS CO	1.79	61.79	2.89	9.00	11.89	12,061.41
ROWAN COS INC	0.45	15.90	2.82	12.00	14.82	1,796.76
RYDER SYSTEM INC	1.03	38.78	2.66	12.00	14.66	2,156.79
SAFEWAY INC	0.36	23.77	1.53	9.50	11.03	10,190.20
SARA LEE CORP	0.47	9.79	4.81	7.00	11.81	6,920.71
SCANA CORP	1.93	35.60	5.43	5.01	10.44	4,194.93
SCHERING-PLOUGH	0.28	17.03	1.66	8.70	10.36	27,694.78
SCHLUMBERGER LTD	0.91	42.33	2.14	8.00	10.14	50,633.79
SCHWAB (CHARLES) CORP	0.29	16.17	1.78	20.00	21.78	18,679.58
SCRIPPS NETWORKS INTERCT-SPN	0.33	22.00	1.50	10.00	11.50	2,798.00
SEALED AIR CORP	0.53	14.94	3.53	10.00	13.53	2,358.64
SEMPRA ENERGY	1.50	42.63	3.51	6.90	10.41	10,385.99
SHERWIN-WILLIAMS CO	1.57	59.75	2.63	12.25	14.88	6,984.89
SIGMA-ALDRICH CORP	0.57	42.24	1.34	9.12	10.47	5,295.08
SIMON PROPERTY GROUP INC	4.07	53.13	7.66	13.00	20.66	12,353.58
SMITH INTERNATIONAL INC	0.58	22.89	2.52	20.00	22.52	5,009.61
SMUCKER (JM) CO	1.38	43.36	3.19	8.00	11.19	5,135.21
SNAP-ON INC	1.32	39.38	3.35	10.00	13.35	2,261.95
SOUTHERN CO	1.78	37.00	4.80	5.76	10.57	28,659.46
SOUTHWEST AIRLINES	0.02	8.62	0.23	10.00	10.23	6,376.42
SPECTRA ENERGY CORP	1.06	15.74	6.77	6.50	13.27	9,617.91

Standard & Poor's Compustat & I/B/E/S (S&P 500) - Jan. 1, 2009

Company Name	Expected Dividend	Recent Price	Yield %	Growth Rate %	Equity Cost %	Market Value
STANLEY WORKS	1.41	34.10	4.13	10.00	14.13	2,686.91
STAPLES INC	0.38	17.92	2.10	14.00	16.10	12,783.89
STARWOOD HOTELS&RESORTS WRLD	0.99	17.90	5.51	9.50	15.01	3,276.17
STATE STREET CORP	1.08	39.33	2.73	12.00	14.73	16,988.71
STRYKER CORP	0.46	39.95	1.16	16.00	17.16	16,129.21
SUNTRUST BANKS INC	2.26	29.54	7.64	4.50	12.14	10,460.38
SUPERVALU INC	0.73	14.60	5.01	6.00	11.01	3,091.58
SYSCO CORP	1.08	22.94	4.69	12.00	16.69	13,744.25
TARGET CORP	0.73	34.53	2.11	14.00	16.11	25,993.49
TECO ENERGY INC	0.86	12.35	7.00	8.10	15.10	2,627.87
TESORO CORP	0.42	13.17	3.20	5.25	8.45	1,823.48
TEXAS INSTRUMENTS INC	0.49	15.52	3.18	12.00	15.18	20,120.52
TEXTRON INC	1.03	13.87	7.43	12.00	19.43	3,344.02
TIFFANY & CO	0.76	23.63	3.22	12.00	15.22	2,909.07
TIME WARNER INC	0.28	10.06	2.74	10.35	13.09	36,089.84
TJX COMPANIES INC	0.49	20.57	2.40	12.00	14.40	8,564.11
TORCHMARK CORP	0.61	44.70	1.37	9.00	10.37	3,800.98
TOTAL SYSTEM SERVICES INC	0.31	14.00	2.24	12.00	14.24	2,755.61
TRAVELERS COS INC	1.30	45.20	2.88	8.50	11.38	26,420.44
TYCO ELECTRONICS LTD	0.72	16.21	4.42	12.00	16.42	7,418.12
TYCO INTERNATIONAL LTD	0.91	21.60	4.22	14.00	18.22	10,215.33
TYSON FOODS INC -CL A	0.21	8.76	2.36	29.15	31.51	2,695.44
U S BANCORP	1.82	25.01	7.27	7.00	14.27	43,882.00
UNION PACIFIC CORP	1.24	47.80	2.60	15.00	17.60	24,207.40
UNITED PARCEL SERVICE INC	2.01	55.16	3.64	11.50	15.14	37,371.95
UNITED STATES STEEL CORP	1.26	37.20	3.39	5.00	8.39	4,324.76
UNITED TECHNOLOGIES CORP	1.69	53.60	3.16	10.00	13.16	50,953.02
UNITEDHEALTH GROUP INC	0.03	26.60	0.13	11.00	11.13	32,127.75
UNUM GROUP	0.33	18.60	1.77	9.50	11.27	6,158.79
VALERO ENERGY CORP	0.62	21.64	2.86	3.00	5.86	11,166.59
VERIZON COMMUNICATIONS INC	1.99	33.90	5.86	8.00	13.86	96,292.41
VF CORP	2.60	54.77	4.74	10.00	14.74	6,028.86
VORNADO REALTY TRUST	3.99	60.35	6.61	5.00	11.61	9,315.26
VULCAN MATERIALS CO	2.40	69.58	3.46	22.70	26.16	7,663.96
WAL-MART STORES INC	1.05	56.06	1.88	11.00	12.88	219,898.27
WALGREEN CO	0.51	24.67	2.07	13.50	15.57	24,399.39
WASTE MANAGEMENT INC	1.20	33.14	3.62	11.00	14.62	16,257.52
WELLS FARGO & CO	1.48	29.48	5.01	8.50	13.51	109,922.63
WESTERN UNION CO	0.04	14.34	0.31	12.00	12.31	10,261.33
WEYERHAEUSER CO	2.52	30.61	8.23	5.00	13.23	6,467.56
WHIRLPOOL CORP	1.88	41.35	4.56	9.55	14.11	3,039.35
WILLIAMS COS INC	0.51	14.48	3.49	15.00	18.49	8,379.20
WINDSTREAM CORP	1.03	9.20	11.20	3.00	14.20	4,042.69
WISCONSIN ENERGY CORP	1.19	41.98	2.83	10.00	12.83	4,908.26
WYETH	1.22	37.51	3.26	2.00	5.26	49,944.08
WYNDHAM WORLDWIDE CORP	0.18	6.55	2.81	15.00	17.81	1,162.59
XCEL ENERGY INC	1.02	18.55	5.50	7.30	12.80	8,329.86
XILINX INC	0.64	17.82	3.61	15.00	18.61	4,880.95
XL CAPITAL LTD	0.84	3.70	22.59	10.00	32.59	1,223.92
XTO ENERGY INC	0.53	35.27	1.50	10.50	12.00	20,344.37

Standard & Poor's Compustat & I/B/E/S (S&P 500) - Jan. 1, 2009

Company Name	Expected Dividend	Recent Price	Yield %	Growth Rate %	Equity Cost %	Market Value
YUM BRANDS INC	0.85	31.50	2.70	12.00	14.70	14,570.58
ZIONS BANCORPORATION	1.36	24.51	5.54	6.00	11.54	2,827.08

Market Weighted Average = **13.44**

Flotation Cost Adjustment

Flotation costs are the costs associated with financing the investment – issuing debt and equity. They are made up of several types of costs including underwriter's fees, legal expenses, cost of preparing the prospectus, etc. In the appraisal process it is appropriate to include the interest rate and any other charges necessary to obtain the financing for the investment. In other words, the cost of financing an investment includes not only the interest rate but also flotation costs (the cost of issuing securities – both debt and equity). *The Appraisal of Real Estate* states the following regarding the cost of financing:

The cost of financing includes the interest rate and any points, discounts, equity participations, or other charges that the lender requires to increase the effective yield on the loan.⁴⁰

Flotation costs can be accounted for either by amortizing the cost (reducing the cash flow to discount), or by including them in the cost of capital. Many studies have been made regarding the amount of flotation costs for debt and equity capital.

In general, the adjustment for flotation costs is a refinement of the basic unadjusted cost. In other words, usually the adjusted and unadjusted costs will not be very different. However, this doesn't imply that you shouldn't make the adjustment. The information needed to make the adjustment is readily available, and the adjustment itself doesn't require much effort or computer processing time. To paraphrase the film maker, Spike Lee, you should do the right thing (*especially if the right thing is relatively easy to do*).⁴¹

Flotation costs occur when new issues of stock or debt are sold to the public. The firm usually incurs several kinds of flotation or transaction costs, which reduces the actual proceeds received by the firm. Some of these are direct out-of-pocket outlays, such as fees paid to underwriters, legal expenses, and prospectus preparation costs. Because of this reduction in proceeds, the firm's required returns on these proceeds equate to a higher return to compensated for the additional costs. Flotation costs can be accounted for either by amortizing the cost, thus reducing the cash flow to discount, or by incorporating the cost

⁴⁰ *The Appraisal of Real Estate*, 13th ed., (Chicago: Appraisal Institute, 2008) p. 154.

⁴¹ Ehrhardt, Michael C., *The Search for Value: Measuring the Company's Cost of Capital*, (Harvard Business School Press: Boston, MA, 1994), p. 134.

into the cost of capital. Because flotation costs are not typically applied to operating cash flow, one must incorporate them into the cost of capital.⁴²

An adjustment for flotation cost must be made even if the issuing company has no plans to ever issue any additional securities. The following illustration is quoted by Roger A. Morin, PhD, *Regulatory Finance: Utilities' Cost of Capital*, (Arlington, VA: Public Utilities Reports, Inc., 1994), p. 170.] and fully addresses this issue.

Brigham, Aberwald, and Gapenski (1985) performed an excellent analysis regarding the need for a flotation cost adjustment. The following illustration adapted from Brigham, Aberwald, and Gapenski (1985) shows that: (1) even if no further stock issues are contemplated, the flotation adjustment is still permanently required to keep shareholders whole, and (2) flotation costs are only recovered if the rate of return is applied to total equity, including retained earnings, in all future years, even if no future financing is contemplated....It is noteworthy that the adjustment is always required each and every year, whether or not new stock issues are sold in the future, and that the allowed return on equity must be earned on total equity, including retained earnings, for investors to earn the cost of equity.⁴³

Companies generally hire an investment banker to assist them when they issue common stock, preferred stock, or bonds. In return for a fee, the investment banker helps the company with the terms, price, and sale of the issue. The banker's fees are often referred to as **flotation costs**. The total cost of capital should include not only the required return paid to investors but also the flotation fees paid to the investment banker for marketing the issue.⁴⁴ [This identical quote is also found in *Fundamentals of Financial Management*, 9th ed. (Dryden Press) by Eugene F. Brigham and Joel F. Houston, Chapter 10.]

Additionally, Dr. Roger Ibbotson refers to flotation cost in his book, *Stocks, Bonds, Bills and Inflation*, when he discusses the cost of capital. He states the following:

Although the cost of capital estimation techniques set forth later in this book are applicable to rate setting, certain adjustments may be necessary. One such

⁴² Pratt, Shannon P., *Cost of Capital, Estimation and Applications*, (NY: John Wiley & Sons, Inc. 1998) p. 176.

⁴³ Roger A. Morin, PhD, *Regulatory Finance: Utilities' Cost of Capital*, (Arlington, VA: Public Utilities Reports, Inc., 1994), p. 170-171. (emphasis added)

⁴⁴ Brigham, Eugene F. and Michael C. Ehrhardt, *Financial Management: Theory and Practice*, 10th ed. (Thomson Learning, Inc.: Stamford, CT, 2002), p. 452.

adjustment is for flotation costs (amounts that must be paid to underwriters by the issuer to attract and retain capital).⁴⁵

All of these studies reach the conclusion that a flotation cost adjustment must be made when estimating the cost of capital. Alternatively, some finance textbooks suggest that it is better to adjust the net present value of the assets downward.

Issue costs. If accepting the project forces the firm to issue securities, then the present value of issue costs should be subtracted from base-case NPV.⁴⁶

In either case (whether the cost of capital is adjusted upward or the net present value of the assets is adjusted downward) the end result is exactly the same – the market value of the assets subject to appraisal is lower as a result of flotation costs.

Even if one accounted for flotation costs as a negative cash flow [as Brealey, Myers and Marcus suggest – see *Fundamentals of Corporate Finance* (2004) 4th ed. Pg. 335-336] rather than an adjustment to the WACC, we should get exactly the same correct valuation. The following will illustrate that it makes no difference mathematically whether we (1) account for flotation costs in the WACC or (2) account for flotation costs as a negative cash flow. Please note the example that follows where we compare the appraisal by either adjusting the WACC for flotation costs or simply deducting the flotation costs from the expected cash flow to get the net cash flow. In both cases \$950 is available to purchase assets because \$50 was the flotation cost from issuing \$1,000 worth of securities. Note that market value in both cases is exactly the same — \$950. Clearly it makes no difference whether one adjusts the WACC or does all the necessary math to find the net present value after treating flotation costs as a negative cash flow at the beginning of the first year. The following flotation cost measurement example is taken from the *Journal of Property Tax Assessment & Administration* published by the International Association of Assessing Officers.⁴⁷

⁴⁵ *Stocks, Bonds, Bills and Inflation: 2008 Yearbook, Valuation Edition* (Chicago: Morningstar, Inc., 2008), p. 35

⁴⁶ Brealey, Richard & Stewart C. Myers, *Principles of Corporate Finance*, 7th ed. (New York: McGraw-Hill, 2002), p. 552.

⁴⁷ Tegarden, Thomas K., “The Appraisal of Public Utilities: Adjustment to the WACC for Flotation Costs,” *Journal of Property Tax Management & Administration*, (Chicago: IAAO), Vol. 5, Issue 1, 2008, pp. 71-74.

Flotation Cost Measurement

WACC Adjustment Method		Cash Flow Adjustment Method			
Securities Issued	\$1,000	Securities Issued \$1,000			
Cost of Capital	10%	Flotation Cost = \$50			
Required Return	\$100	Assets Purchased \$950			
Flotation Cost =	5.00%	Disc. Rate = Unadjusted WACC = 10.00%			
Flotation Cost =	50				
Assets Purchased	950	First Year's Cash Flow:			
		Pres. Value Factor NCF			
Cost of Capital	10.00%	Beg. of Year	(\$50)	1.10	(\$55)
1 - FC =	0.95	First Year's Income = 100			
Adj'd. Cost of Cap.	10.5263%	First Year's Net Cash Flow = 45			
Market Value:		End of Year	NCF	Pres. Value Factor (divisor)	Pres. Value
Required Return	100	1	45	1.10	40.91
	----- = \$950	2	100	1.21	82.64
Adj'd Cost of Cap.	10.5263%	3	100	1.33	75.13
		4	100	1.46	68.30
		5	100	1.61	62.09
		6	100	1.77	56.45
		7	100	1.95	51.32
		8	100	2.14	46.65
		9	100	2.36	42.41
		10	100	2.59	38.55
		skip to			
		339	100	107,676,335,910,201.00	0.00
		340	100	118,443,969,501,221.00	0.00
		341	100	130,288,366,451,343.00	0.00
		342	100	143,317,203,096,477.00	0.00
		343	100	157,648,923,406,125.00	0.00
		344	100	173,413,815,746,737.00	0.00
		345	100	190,755,197,321,411.00	0.00
		346	100	209,830,717,053,552.00	0.00
		347	100	230,813,788,758,908.00	0.00
		348	100	253,895,167,634,798.00	0.00
		349	100	279,284,684,398,278.00	0.00
		350	100	307,213,152,838,106.00	0.00
					\$950.00

As one can see from the above mathematical example the same \$950 value results in either case. Actually, it is wrong to presuppose that one knows how much flotation cost to deduct in a valuation problem because in order to know exactly how much flotation cost will be, one has

to already know what the value in order to know how much debt and equity will have to be issued. Thus, the appraiser must be biased or clairvoyant or both. **In solving a valuation problem, the WACC adjustment method is best.** If one already knew how much debt and equity securities would have to be issued, one would have to already know the purchase price and thus the valuation. It's a 'Catch 22.' If one already knew the value, why do an appraisal at all?

The flotation costs associated with debt for large issues conservatively are approximately 1%. For relatively large issues of equity, the flotation costs range from a low of 2% to as much as 6%.

From information derived from *Public Utility Finance Tracker* we determined the average flotation cost associated with the issuance of long-term debt and common stock of natural gas and natural gas transmission companies. We found the average issuance cost of long-term debt to be 1.04% and the average issuance cost of common equity to be 4.28%. We selected 1.00% and 4.25% to be representative of the typical flotation cost associated with the issuance of long-term debt and common stock securities respectively.

On the following pages are the schedules detailing the long-term debt and common stock flotation costs.

Debt Issuance Cost

Natural Gas/Transmission Utilities (1997 - 2008)

Company	Type of Utility	Issue Date	Amount Offered (\$000)	Price to Public (\$/100)	Net Proceeds	Issue Cost
Michigan Con Gas Company	Gas	14-May-97	15,000	100.000	96.8683	3.23%
Michigan Con Gas Company	Gas	15-May-97	30,000	100.000	99.2467	0.76%
Michigan Con Gas Company	Gas	15-May-97	40,000	100.000	99.3605	0.64%
Seagull Energy Corp.	Gas	25-Sep-97	150,000	99.544	98.5437	1.02%
SONAT Inc.	Gas	25-Sep-97	100,000	99.748	99.0970	0.66%
Southern Natural Gas Co.	Gas	25-Sep-97	100,000	99.891	99.2393	0.66%
Laclede Gas	Gas	16-Oct-97	25,000	98.682	98.3519	0.34%
Kn Energy Inc.	Gas	22-Oct-97	150,000	100.000	99.3740	0.63%
Northern Illinois Gas Co.	Gas	23-Oct-97	50,000	99.500	98.9960	0.51%
Enron Oil & Gas Co.	Gas	25-Nov-97	100,000	99.709	99.0580	0.66%
Consolidated Natural Gas Co.	Gas	09-Dec-97	300,000	99.190	98.3143	0.89%
SONAT	Gas	27-Jan-98	100,000	99.531	98.8790	0.66%
SONAT	Gas	29-Jan-98	100,000	99.787	98.9115	0.89%
KN Energy, Inc.	Gas	04-Mar-98	500,000	99.784	98.9081	0.89%
KN Energy, Inc.	Gas	04-Mar-98	150,000	99.496	98.3701	1.14%
Coastal Corp.	Gas	02-Jun-98	200,000	99.882	99.2314	0.66%
Coastal Corp.	Gas	02-Jun-98	200,000	99.661	98.7854	0.89%
Wisconsin Gas Co.	Gas	19-Jan-99	50,000	99.252	98.6020	0.66%
No. Illinois Gas Co.	Gas	02-Feb-99	50,000	100.000	99.3500	0.65%
Providence Gas Co.	Gas	04-Feb-99	15,000	100.000	96.8500	3.25%
Cascade Natural Gas Corp.	Gas	15-Mar-99	15,000	100.000	99.2500	0.76%
Laclede Gas Co.	Gas	28-May-99	25,000	100.000	99.5020	0.50%
Mich. Consolidated Gas Co.	Gas	04-Jun-99	55,000	100.000	96.8500	3.25%
Williams Co.	Gas	21-Jul-99	700,000	99.075	98.2000	0.89%
Williams Communication Grp.	Gas	30-Sep-99	1,500,000	99.249	96.7490	2.58%
Indiana Gas Co.	Gas	04-Oct-99	30,000	100.000	99.3750	0.63%
Northwest Natural Gas	Gas	09-Dec-99	20,000	100.000	99.2500	0.76%
SEMCO Energy	Gas	12-Apr-00	30,000	100.000	97.2500	2.83%
New Jersey Gas Co.	Gas	29-Jun-00	10,000	100.000	99.2500	0.76%
New Jersey Gas Co.	Gas	05-Jul-00	10,000	100.000	96.8500	3.25%
New Jersey Gas Co.	Gas	01-Jul-00	15,000	100.000	97.6000	2.46%
Northwest Natural Gas	Gas	29-Aug-00	20,000	100.000	99.2500	0.76%
Northwest Natural Gas	Gas	06-Sep-00	20,000	100.000	99.2500	0.76%
Northwest Natural Gas	Gas	06-Sep-00	10,000	100.000	99.2500	0.76%
Northwest Natural Gas	Gas	27-Nov-00	25,000	100.000	99.3750	0.63%
Agl Capital Corp	Gas	23-Feb-01	300,000	99.578	98.9280	0.66%
Oneok, Inc	Gas	03-Apr-01	400,000	99.912	99.2620	0.65%
Atmos Energy Corp	Gas	15-May-01	350,000	99.940	99.2900	0.65%
Semco Energy	Gas	18-Jun-01	60,000	100.000	97.5000	2.56%
Questar Gas Co.	Gas	03-Oct-01	60,000	100.000	99.3750	0.63%
Northwest Natural Gas	Gas	26-Mar-02	40,000	100.000	99.375	0.63%
Northwest Natural Gas	Gas	24-Sep-02	30,000	100.000	99.250	0.76%
UGI Utilities Inc.	Gas	25-Sep-02	20,000	100.000	99.375	0.63%
California Gas Co.	Gas	02-Oct-02	250,000	99.897	99.247	0.65%
AGL Capital Corp.	Gas	07-Jan-03	225,000	99.927	99.277	0.65%
Atmos Energy Corp	Gas	13-Jan-03	250,000	99.915	99.250	0.67%
Sepra Energy	Gas	01-Feb-03	400,000	99.658	99.008	0.66%
Michigan Consolidated Gas Co	Gas	12-Feb-03	200,000	99.637	98.762	0.89%

Debt Issuance Cost

Natural Gas/Transmission Utilities (1997 - 2008)

Company	Type of Utility	Issue Date	Amount Offered (\$000)	Price to Public (\$/100)	Net Proceeds	Issue Cost
Northwest Natural Gas	Gas	25-Feb-03	10,000	100.000	99.250	0.76%
Nisource Finance Corp	Gas	01-Mar-03	345,000	100.000	99.354	0.65%
Keyspan Corporation	Gas	01-Apr-03	150,000	99.763	98.888	0.88%
AGL Capital Corp.	Gas	15-Apr-03	225,000	99.927	99.277	0.65%
The Cincinnati Gas & Electric Co.	Gas	12-Jun-03	200,000	99.764	98.889	0.88%
The Cincinnati Gas & Electric Co.	Gas	12-Jun-03	200,000	99.396	98.521	0.89%
Baltimore Gas And Electric Co.	Gas	17-Jun-03	200,000	99.295	98.420	0.89%
Nisource Finance Corp	Gas	16-Jul-03	500,000	99.862	99.212	0.66%
Vectren Coproation	Gas	24-Jul-03	100,000	99.746	99.096	0.66%
Vectren Coproation	Gas	24-Jul-03	100,000	99.177	98.477	0.71%
UGI Utilities	Gas	14-Aug-03	20,000	100.000	99.250	0.76%
UGI Utilities	Gas	14-Aug-03	25,000	100.000	99.370	0.63%
Energy East Corporation	Gas	08-Sep-03	200,000	99.830	98.950	0.89%
Madison Gas & Electric Co	Gas	09-Sep-03	20,000	100.000	99.250	0.76%
Energen Corporation	Gas	30-Oct-03	50,000	99.557	98.907	0.66%
Northwest Natural Gas	Gas	21-Nov-03	40,000	100.000	99.250	0.76%
Piedmont Natural Gas Co Inc	Gas	16-Dec-03	100,000	99.859	98.984	0.88%
Piedmont Natural Gas Co Inc	Gas	16-Dec-03	100,000	100.000	99.350	0.65%
AGL Resources	Gas	14-Dec-04	200,000	99.870	99.220	0.66%
Aquila	Gas	18-Aug-04	300,000	25.000	25.000	0.00%
Atmos Energy	Gas	18-Oct-04	500,000	99.993	99.343	0.65%
Atmos Energy	Gas	18-Oct-04	200,000	99.392	98.517	0.89%
Laclede Gas Co.	Gas	21-Apr-04	50,000	99.585	98.835	0.76%
Laclede Gas Co.	Gas	21-Apr-04	100,000	99.434	98.559	0.89%
Michigan Consolidated Gas	Gas	27-Sep-04	120,000	99.594	98.844	0.76%
Consolidated Natural Gas Co	Gas	15-Nov-04	400,000	99.686	99.036	0.66%
Alabama Gas Corp	Gas	11-Jan-05	40,000	100.000	96.860	3.24%
Alabama Gas Corp	Gas	11-Jan-05	40,000	100.000	99.350	0.65%
Alabama Gas Corp	Gas	14-Nov-05	80,000	100.000	99.400	0.60%
Cascade Natural Gas	Gas	20-Jan-05	30,000	100.000	96.850	3.25%
Cascade Natural Gas	Gas	29-Aug-05	15,000	100.000	99.300	0.70%
Northwest Natural Gas Co.	Gas	02-Jun-05	40,000	100.000	99.375	0.63%
Northwest Natural Gas Co.	Gas	21-Jun-05	10,000	100.000	99.250	0.76%
Vectren Utility Holdings, Inc	Gas	16-Nov-05	75,000	99.799	99.149	0.66%
Vectren Utility Holdings, Inc	Gas	16-Nov-05	75,000	99.779	98.904	0.88%
Laclede Gas Co.	Gas	06-Jun-06	55,000	99.852	98.977	0.88%
Piedmont Natural Gas Co., Inc	Gas	15-Jun-06	200,000	100.000	96.850	3.15%
AGI Capital Resources	Gas	27-Jun-06	175,000	99.856	99.206	0.65%
Southern Union Co.	Gas	18-Oct-06	600,000	99.644	98.344	1.30%
Northwest Natural Gas Co.	Gas	15-Dec-06	25,000	100.000	99.375	0.63%
Alabama Gas Corp	Gas	10-Jan-07	45,000	100.000	99.125	0.88%
Atmos Energy Corp	Gas	11-Jun-07	250,000	99.729	99.079	0.66%
UGI Utility Inc	Gas	19-Jun-07	200,000	99.375		
Vectren Utility Holdings, Inc	GAS	05-Mar-08	125,000	100.000	96.850	3.25%
Vectren Utility Holdings, Inc	GAS	24-Mar-08	100,000	99.930	99.062	0.88%
Vectren Utility Holdings, Inc	GAS	24-Mar-08	50,000	99.400	99.290	0.11%
Questar Gas Co.	GAS	24-Mar-08				
Laclede Gas Co	GAS	18-Sep-08	80,000	100.000	96.850	3.25%

Debt Issuance Cost

Natural Gas/Transmission Utilities (1997 - 2008)

Company	Type of Utility	Issue Date	Amount Offered (\$000)	Price to Public (\$/100)	Net Proceeds	Issue Cost
Washington Gas Light	GAS	05-Dec-08	50,000	100.000	99.375	0.63%
					Average	1.04%
					Selected	1.00%

Source: *Public Utility Finance Tracker*, February 1999 - 2009.

Common Stock Issuance Cost

Natural Gas/Transmission Utilities (1990 - 2008)

Company	Type of Company	Issue Date	Number of Shares (000)	Price to Public	Net Proceeds	Issue Cost
Consolidated Natural Gas	Gas	08-Jan-90	3,500	45.50	44.24	2.85%
Washington Energy	Gas	17-Jan-90	1,750	20.13	19.26	4.52%
Colonial Gas	Gas	15-May-90	600	21.50	20.27	6.07%
Atlanta Gas Light	Gas	05-Dec-90	1,000	31.38	30.00	4.60%
Washington Energy	Gas	04-Feb-91	2,650	19.00	18.21	4.34%
Piedmont Natural Gas	Gas	03-Apr-91	1,250	28.50	27.36	4.17%
Panhandle Eastern	Gas	18-Jul-91	13,800	10.75	10.27	4.67%
Bay State Gas Co.	Gas	13-Mar-92	1,550	23.25	22.28	4.35%
El Paso Natural Gas Co.	Gas	12-May-92	5,000	19.00	17.77	6.92%
New Jersey Resources Co.	Gas	15-Sep-92	1,500	22.25	21.27	4.61%
Washington Energy Co.	Gas	29-Sep-92	2,750	21.00	20.19	4.01%
Equitable Resources	Gas	22-Sep-93	2,400	38.50	37.25	3.36%
Brooklyn Union Gas	Gas	29-Sep-93	1,700	25.75	24.77	3.96%
S.E. Michigan Gas Enterprises	Gas	19-Jan-94	650	20.50	19.62	4.49%
Connecticut Energy Corp.	Gas	03-Mar-94	900	20.13	19.22	4.71%
Mobile Gas Service Corp.	Gas	14-Sep-94	400	22.00	20.30	8.37%
Northwest Natural Gas	Gas	15-Feb-95	1,000	29.75	28.59	4.06%
MCN Corp.	Gas	14-Mar-95	5,000	17.88	17.21	3.86%
Piedmont Natural Gas	Gas	20-Mar-95	1,500	20.00	19.14	4.49%
Laclede Gas	Gas	15-May-95	1,550	19.00	18.12	4.86%
United Cities	Gas	08-Jun-95	1,200	14.50	13.88	4.47%
Atlanta Gas Light	Gas	12-Jun-95	1,300	33.63	32.51	3.43%
WICOR, INC.	Gas	05-Dec-95	1,100	31.88	30.63	4.06%
Connecticut Natural Gas	Gas	05-Jun-96	640	23.25	22.19	4.78%
Delta Natural Gas	Gas	15-Jul-96	350	16.00	15.07	6.17%
Tejas Gas	Gas	22-Jul-96	3,075	35.00	33.42	4.73%
KN Energy	Gas	31-Jul-96	3,100	32.25	31.01	4.00%
Cascade Natural Gas	Gas	13-Aug-96	1,350	15.25	14.45	5.54%
Energen	Gas	17-Jan-97	1,500	29.50	28.39	3.91%
KCS Energy	Gas	29-Jan-97	3,000	39.00	36.91	5.66%
Energen	Gas	18-Sep-97	1,200	35.50	34.16	3.92%
COHO Energy, Inc.	Gas	29-Sep-97	8,585	10.50	9.87	6.38%
Fall River Gas Co.	Gas	30-Oct-97	340	13.25	12.06	9.87%
Connecticut Energy Corp.	Gas	12-Nov-97	900	24.25	23.17	4.66%
Roanoke Gas Co.	Gas	22-Feb-98	166	20.00	18.67	7.12%
KN Energy	Gas	04-Mar-98	11,000	52.00	49.90	4.21%
Enron Corp.	Gas	05-May-98	15,000	50.00	48.47	3.16%
Laclede Gas Co.	Gas	05-May-99	1,100	50.00	49.34	1.35%
SEMCO	Gas	12-Jun-00	9,000	10.00	9.60	4.17%
WGL Holdings Co.	Gas	26-Jun-01	1,790	26.73	25.80	3.47%
Utilicorp	Gas	25-Jan-02	11,000	23.00	22.28	3.25%
Calpine Corporation	Gas	24-Apr-02	66,000	11.50	11.13	3.30%
MDU Resources Group	Gas	19-Nov-02	2,100	24.00	23.30	3.00%
MDU Resources Group	Gas	29-Nov-02	2,100	24.00	23.16	3.63%
Agi Resources, Inc	Gas	11-Feb-03	5,600	22.00	21.21	3.70%
Atmos Energy Corp.	Gas	18-Jun-03	4,000	25.31	24.25	4.38%
Sempra Energy	Gas	23-Oct-03	15,000	28.00	27.15	3.12%
Southern Union Co.	Gas	10-Jun-03	3,000	16.15	16.15	0.00%

Common Stock Issuance Cost
Natural Gas/Transmission Utilities (1990 - 2008)

Company	Type of Company	Issue Date	Number of Shares (000)	Price to Public	Net Proceeds	Issue Cost
Southern Union Co.	Gas	05-Jun-03	9,500	16.00	15.38	4.06%
Southern Union Co.	Gas	15-Jun-03	2,500	50.00	48.17	3.80%
Vectren Corporation	Gas	07-Aug-03	6,500	22.81	22.00	3.70%
AGL Resources	Gas	19-Nov-04	9,600	31.010	30.038	3.23%
Ameren	Gas	30-Jun-04	10,000	42.000	40.700	3.19%
Aquila(M)	Gas	18-Aug-04	40,000	2.550	2.451	4.04%
Atmos Energy Co.	Gas	21-Oct-04	14,000	24.750	23.760	4.17%
Northwest Natural Gas Co.	Gas	30-Mar-04	1,200	31.000	29.844	3.87%
Piedmont Natural Gas Co. Inc	Gas	20-Jan-04	4,250	42.500	41.010	3.63%
Southern Union Co.	Gas	26-Jul-04	11,000	18.750	18.003	4.15%
The Laclede Group Inc	Gas	06-May-04	1,500	26.800	25.862	3.63%
UGI Corp.	Gas	18-Mar-04	7,500	32.100	30.696	4.58%
Semco Energy	Gas	09-Aug-05	27,176	6.320	6.067	4.17%
Southern Union Co.	Gas	07-Feb-05	342,999	23.000	22.300	3.14%
Chesapeake Utility Corp	Gas	15-Nov-06	600	30.100	28.975	3.88%
Vectron Corp	Gas	22-Feb-07	4,600	28.33	27.34	3.62%
Average						4.28%
Selected						4.25%

Source: Public Utility Finance Tracker, February 1999 - 2009.

Incorporating the flotation costs found on the previous pages into our cost of capital study is accomplished as shown in the table below.

Corp. Tax Rate = 38.00%				Flotation Cost Adjustment			
Capital	Portion	Cost	Product	Flot. Cost	Divisor	Adj Cost	Product
Debt	40.00%	8.50%	3.40%	1.00%	99.38%	8.55%	3.42%
Equity	60.00%	12.00%	7.20%	4.25%	95.75%	12.53%	7.52%
Totals	100.00%		10.60%				10.94%

The flotation cost adjustment for debt considers the tax deductibility of interest cost and the divisor for debt is obtained by subtracting the debt flotation cost times 1 minus the approximate corporate tax rate from 100% shown as follows: $1 - (0.01 \times (1 - 0.38)) = 99.38\%$. Next we divide cost of debt of 8.50% by the divisor to obtain the flotation cost adjusted cost of debt, which is then multiplied times the debt portion of the capital structure to obtain the product of 3.42%. The divisor for the equity cost is 1 minus the equity flotation costs ($100\% - 4.25\% = 95.75\%$). Next we divide cost of equity of 12.00% by the divisor to obtain the flotation cost adjusted cost of equity, which is then multiplied times the equity portion of the capital structure to obtain the product of 7.52%. The sum of the two products is **10.94%** (rounded to **10.95%**) and is the cost of capital for the typical interstate natural gas pipeline after accounting for flotation costs.

Other Issues Regarding the Cost of Capital

Geometric Mean vs. Arithmetic Mean

Occasionally appraisers make the mistake of using the geometric mean rather than the arithmetic mean in measuring the equity risk premium. The geometric mean is backward-looking, measuring the change in wealth over more than one period. On the other hand, the arithmetic mean better represents a typical performance over single periods and serves as the correct rate for forecasting, discounting, and estimating the cost of capital. Dr. Roger Ibbotson has written regarding this issue as follows:

The equity risk premium data presented in this book are arithmetic average risk premia as opposed to geometric average risk premia. The arithmetic average equity risk premium can be demonstrated to be most appropriate when discounting future cash flows. For use as the expected equity risk premium in either the CAPM or the building block approach, the arithmetic mean or the simple difference of the arithmetic means of stock market returns and riskless

rates is the relevant number. This is because both the CAPM and the building block approach are additive models, in which the cost of capital is the sum of its parts. The geometric average is more appropriate for reporting past performance, since it represents the compound average return.⁴⁸

Additionally, Dr. Roger Morin addressed the issue of the arithmetic versus geometric means in estimating the cost of capital.

In statistical parlance, the arithmetic average is the unbiased measure of the expected value of repeated observations of a random variable, not the geometric mean. This appendix formally illustrates that only arithmetic averages can be used as estimates of cost of capital, and that the geometric mean is not an appropriate measure of cost of capital.⁴⁹

Brealey, Myers and Allen also addressed this issue:

If the cost of capital is estimated from historical returns or risk premiums, use arithmetic averages, not compound annual rates of return (geometric averages).⁵⁰

Income Return

The income return is the appropriate return for use in calculating the equity risk premium. This issue is discussed in SBBI as follows:

Another point to keep in mind when calculating the equity risk premium is that the income return on the appropriate-horizon Treasury security, rather than the total return, is used in the calculation. The total return is comprised of three return components: the income return, the capital appreciation return, and the reinvestment return. The income return is defined as the portion of the total return that results from a periodic cash flow or, in this case, the bond coupon payment. The capital appreciation return results from the price change of a bond over a specific period. Bond prices generally change in reaction to unexpected fluctuations in yields. Reinvestment return is the return on a given month's investment income when reinvested into the same asset class in the subsequent months of the year. The income return is thus used in the estimation of the

⁴⁸ *Stocks, Bonds, Bills and Inflation: 2008 Valuation Edition Yearbook*, (Chicago: Morningstar, Inc., 2008), p. 77.

⁴⁹ Morin, Roger A., *New Regulatory Finance* (Vienna, VA: Public Utilities Reports, Inc., 2006), p. 133.

⁵⁰ Richard A. Brealey, Stewart C. Myers, and Paul Allen, *Principles of Corporate Finance*, 8th ed., (Irwin McGraw-Hill, 2006), pp. 156-157.

equity risk premium because it represents the truly riskless portion of the return.⁵¹

Unlike the yield on a bond, the expected equity risk premium is unobservable in the market and must be estimated, typically by using historical data.⁵² It can be calculated by subtracting the long-term average of the income return on the riskless asset from the long-term average stock market return (measured over the same period as for the riskless asset). The maturity (or duration) of the riskless asset from which r_f is taken must be the same as that used to estimate ERP. When calculating the equity risk premium, some analysts subtract a long-term Treasury bond's total return-rather than its income return-from the total return on the overall stock market. The income return is the better measure of return to be subtracted from the stock market total return for two reasons:

1. It is the completely riskless portion of the issues' returns (Treasury securities are subject to price risk).
2. Bond yields have risen historically, causing capital losses in fixed-income securities (including U.S. Treasury issues). These capital losses caused bonds' total returns to be lower than the returns that investors expected. In other words, had the investor held the bond to maturity, the investor would have realized the yield on the bond as the total return; but in a constant maturity portfolio such as those used to measure bond returns in this book, bonds are sold before maturity (at a capital loss if the market yield has risen since the time of purchase). There is no evidence that investors expect bond capital losses to be repeated in the future (otherwise bond prices would be adjusted accordingly), so that historical total returns are biased downward as indicators of future expectations. Historical income returns, in contrast, are unbiased estimators of the returns that investors expected.⁵³

Equity Risk Premium Puzzle

In 1985, Mehra and Prescott published a paper that discussed the equity risk premium from a utility theory perspective. The point that Mehra and Prescott make is that under existing economic theory, economists cannot justify the magnitude of the equity risk premium.

⁵¹ *Stocks, Bonds, Bills and Inflation: 2008 Yearbook, Valuation Edition* (Chicago: Morningstar, Inc., 2008), p. 75-76.

⁵² It should be noted that from a valuation specialist's point of view, the stock market returns presented in this book are after corporate taxes but before personal taxes, and should be applied to cash flows calculated on the same basis.

⁵³ *Stocks, Bonds, Bills and Inflation: 1999 Yearbook*, (Chicago: Ibbotson Associates, Inc., 1999), pp. 154-155.

The utility theory model employed was incapable of obtaining values consistent with those observed in the market.

This is an interesting point and may be worthy of further study, but it does not do anything to prove that the equity risk premium is too high. It may, on the other hand, indicate that theoretical economic models require further refinement to adequately explain market behavior.⁵⁴

There is no historical data to suggest a systematic decline in the market risk premium in estimating the cost of equity.

Are there any historical data to suggest a systematic decline in the market risk premium? Exhibit 10.5 plots five-year rolling averages of the market equity risk premium from 1930 to 1995. The volatility of the market risk premium has decreased, but what about the average market risk premium? A regression of the rolling five-year market risk premium versus time indicates that there is no statistically significant change in the risk premium between 1926 and 1995. The slope of the regression is not significantly different from zero.⁵⁵

Survivorship Bias

Some have suggested that a negative adjustment should be made to the cost of equity for survivorship bias. They argue that the United States has been the most successful stock market of the twentieth century and therefore equity costs do not consider the low returns that failing companies might indicate. If that is the case, is it possible that the equity risk premium statistics based only on U.S. data may overstate the returns of equities as a whole because they only focus on one successful market? According to Dr. Roger Ibbotson this is not the case.

While the survivorship bias evidence may be compelling on a worldwide basis, one can question its relevance to a purely U.S. analysis. If the entity being valued is a U.S. company, then the relevant data set should be the performance of equities in the U.S. market.⁵⁶

⁵⁴ *Stocks, Bonds, Bills and Inflation: 2008 Yearbook, Valuation Edition* (Chicago: Morningstar, Inc., 2008), p. 89.

⁵⁵ Copeland, Tom, Tim Koller & Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, 3rd ed. (New York: John Wiley & Sons, 2000), 217.

⁵⁶ *Stocks, Bonds, Bills and Inflation: 2008 Yearbook, Valuation Edition* (Chicago: Morningstar, Inc., 2008), p. 89.

Other studies have reached similar conclusions – that survivorship bias is of no significance in measuring the cost of equity in U. S. equity markets.

The U.S. equity premium plays an important role in many areas of finance research and practice. Therefore, the concerns raised by Brown, Goetzmann, and Ross (BGR) that the equity premium might contain serious survival bias should be studied with great care: If proven true, this hypothesis would have widespread impact.

Based on a general survival model developed in this paper, we show that the fundamental difficulty facing the survival argument is that to have high survival bias, the probability of market survival over the long run has to be extremely small, which seems to be inconsistent with existing historical evidence. Therefore, we argue that contrary to what BGR suggest, the survival bias in the U.S. equity premium is unlikely to be significant and the resultant concerns about the survival problem in the current literature are probably overstated.⁵⁷

Thus, we believe that there is no significant survivorship bias affecting our estimate of the cost of capital for the Interstate Natural Gas Pipeline industry at January 1, 2009, and no adjustment is necessary.

⁵⁷ Li, Haitao, and Yuewu Xu, “Survival Bias and the Equity Premium Puzzle,” *The Journal of Finance*, Vol. LVII, Issue 5, October 2002, p. 1991. (emphasis added)

Supplement to the Cost of Capital Study

The income approach is based on the principle of anticipation primarily and involves converting dollars of expected future income into present value. The execution of the income approach involves the selection of the appropriate capitalization method, estimation of the expected income, and estimation of a proper capitalization rate which matches the income to be capitalized. The basic income formula is shown in the box to the right.

$$\text{Value} = \frac{\text{Income}}{\text{Rate}}$$

Income-producing property is typically purchased for investment purposes, and the projected net income stream is the critical factor affecting its market value. An investor purchasing income-producing property is in effect trading a sum of present dollars for the right to a stream of future dollars. There is a relationship between the two, and the connecting link is the process of capitalization. Because future dollars are worth less than present dollars, the anticipated future dollars are discounted to a present worth on some basis that reflects the risk and the waiting time involved.

The historical development of the income approach reflects a movement away from an initial emphasis on physical components of value toward a greater emphasis on investment components. The initial division of capitalization was between the concept of value as income divided by a rate (straight capitalization) and as income multiplied by a factor (annuity capitalization). Contemporary income appraisal theory revolves around two categories of capitalization methods — *direct* capitalization and *yield* capitalization.

Rates of Return

The typical investor's objective in any investment is to ultimately receive more than the amount invested. The investor thus wants a complete return *of* all capital invested and, in addition, a fair return *on* the capital invested. Thus, the investor expects to completely recoup his investment and be fairly compensated for the use of his capital. The return *of* capital is usually referred to as the recapture of the initial capital investment. The return *on* capital is usually referred to as the compensation an investor receives for the use of his capital until the capital is recaptured.

All rates of return can be classified as either 1) *income rates* or 2) *yield rates*. An example of an income rate is the *overall capitalization rate (R_c)*. An example of a yield rate is the property's *overall yield rate*, which is synonymous with the *discount rate* and the *cost of capital*. Under certain conditions, the income and yield rates for a property are equal even though they are not conceptually equal.

Categories of Capitalization

There are two categories (sometimes called methods) of capitalization which can be used in the income approach — *direct* and *yield* capitalization. Each category is based on sound appraisal theory and each is theoretically different in application. Direct capitalization is accomplished by the use of an *overall capitalization rate* (R_o). The overall capitalization rate is actually the percent that a single year's income (usually the first year's income) represents as compared to market value. Yield capitalization is accomplished through the use of an *overall yield rate* (Y_o). The overall yield rate is conceptually the weighted average of the interest rate for long-term debt and the equity yield rate and is also known as the *weighted average cost of capital (WACC)* or *discount rate*. Unlike the overall capitalization rate, the overall yield rate is not necessarily the percent of market value that the first year's income represents. However, under certain circumstances the overall capitalization rate and the overall yield rate are identical.

Direct Capitalization

Direct capitalization is a method of converting one year's income into value in one direct step, usually by dividing the income estimate by the appropriate income rate. It is the present worth of the future earnings that gives a proper indication of value by the income approach. Typically the income capitalized is the estimated net utility operating income expected in the following year. Net utility operating income for public utilities is defined as the income representing the amount available to pay the debt costs and equity costs for the property. Public utility regulatory commissions (both state and federal) recognize that net utility operating income is the level of income necessary to pay the cost of capital annually.

Regulatory commissions develop the cost of debt capital and cost of equity capital for the INGPI company in each rate case. The cost of debt capital and the cost of equity capital is weighted by the respective percentages of the amount of debt and equity in the overall capital structure for the utility. The resulting **weighted average cost of capital** is multiplied by the authorized rate base to obtain the authorized net utility operating income for regulatory purposes, which is the targeted amount that the regulatory commissions intend for the utility to earn each year to pay its cost of capital. Net utility operating income is reported on the utility's income statement and it is the amount available to pay to debt and equity holders. Thus, net utility operating income is the level of income set by regulatory commissions to fully cover the cost of capital of a public utility.

A note of caution about the use of direct capitalization is given here. There are six accepted techniques which can be used correctly to derive the overall capitalization rate used in direct capitalization. They are as stated below.

Accepted techniques include 1) derivation from comparable sales, 2) derivation from effective gross income multipliers and net income ratios, 3) band of investment—mortgage and equity components, 4) band of investment—land and building components, 5) the debt coverage formula, and 6) yield capitalization techniques such as the general yield change formula, $R_o = \text{yield} - \text{change in income and value}$, and the Ellwood method.⁵⁸

No generally accepted appraisal literature indicates that it is proper under any circumstances to use sales of stock as comparable sales for deriving an overall capitalization rate or even an equity capitalization rate. In fact, there is an abundance of caution in appraisal literature about the use of sales that are not comparable to the property being appraised (such as deriving earnings-price ratios from stock transactions). For example, the following quotation addresses this issue:

Fundamental Investment Difference between Investment Securities and Real Estate/Tangible Personal Property. Table 29-2 summarizes some of the intrinsic differences between capital market securities (whether debt or equity instruments) and real estate and tangible personal property (either individual assets or going concern assemblages of assets) as investment alternatives.

Table 29-2
Investment Differences between Securities and Real Estate/Personal Property

Securities (Debt or Equity Instruments)		Real Estate/Personal Property (Individually or as a Mass Assemblage)	
1.	Liquid, marketable investments	1.	Illiquid investments
2.	Noncontrolling interest in income production and distribution	2.	Controlling interest in income production and distribution
3.	Small, absolute dollar investment required	3.	Large, absolute dollar investment required
4.	Small percentage of overall wealth committed to this investment	4.	Large percentage of overall wealth committed to this investment
5.	Diversified portfolio of investments	5.	Nondiversified portfolio of investments
6.	Short-term investment time horizon	6.	Long-term investment time horizon
7.	Does not require re-investment to maintain investment base	7.	Requires “replenishment” investment to maintain investment base
8.	Investments expected to appreciate over time	8.	Investments expected to depreciate over time
9.	Income typically subject to only individual tax (from investor’s perspective)	9.	Income typically subject to both corporate and individual tax (from investor’s perspective)
10.	Portfolios can be created in limitless combinations of risky securities and risk-free securities	10.	Portfolio limited to the particular combination of real estate and personal property that operate the subject business

As the table indicates, there are fundamental investment risk and return differences between (1) marketable, minority interests in debt and equity securities and (2) nonmarketable, controlling interests in operating real estate

⁵⁸ *The Appraisal of Real Estate*, 11th ed., (Chicago: Appraisal Institute, 1996), p. 514.

and tangible personal property. Due to these differences, and for other reasons, it is unlikely that an economic model that correlates nondiversified risk and expected return for one type of investment will effectively serve the same function for such a different type of investment.⁵⁹

Thus, it is clear from appraisal literature that it is absolutely wrong to use earnings-price ratios derived from stock sales as the equity capitalization rate or the equity yield rate in the appraisal of tangible assets or mass assemblages of assets as a going concern. Further, it is improper to use earnings-price ratios to match with the net utility operating income authorized by the FERC. The FERC does not utilize earnings-price ratios in the determination of the cost of equity for any company or in setting the authorized net operating amount. Finally, for the FERC to set the cost of equity capital based on earnings-price ratios would violate the mandates of the US Supreme court in their *Hope Natural Gas* and *Bluefield Water Works* decisions, which require the regulatory commissions to allow the regulated utilities to earn their cost of capital (commensurate with the return earned by companies of comparable risk).

Appraisal texts do not tell us that an appraiser may derive equity capitalization rates from the stock market, however the same appraisal texts emphatically state that appraisers can derive equity yield rates from stocks and bonds of commensurate risk in the market. The use of earnings-price ratios as a substitute for the equity capitalization rate in deriving equity value, is simply not permissible. Additionally, the majority of public utility companies are subsidiaries of publicly traded holding companies. The use of a parent company traded stock earnings-price ratio as comparison to an untraded subsidiary company would further exacerbate an incorrect equity value.

Yield Capitalization

Yield capitalization is a method of converting a series of income flows (called cash flows) or a singular representative level cash flow into present value by discounting the expected future benefits at an appropriate discount rate (synonymous with the property's **overall yield rate or cost of capital**).

To perform yield capitalization, an appraiser 1) selects an appropriate projection period; 2) forecasts all future cash flows or cash flow patterns (including the reversion); 3) chooses an appropriate yield rate; and 4) converts future benefits into present value by discounting each annual future benefit or by developing an overall rate that reflects the income pattern, value change, and yield rate using one of the various yield capitalization formulas. The application of capitalization rates that reflect an appropriate yield rate, the use of present value

⁵⁹ Pratt, Reilly, & Schweih, *Valuing A Business*, 3rd edition, (Chicago: Irwin Professional Publishing, 1996), 708.

factors, and discounted cash flow analysis are all yield capitalization procedures.⁶⁰

Thus, the appraiser performs yield capitalization by either 1) discounting each individual cash flow to its present value for the duration of the income, or 2) capitalizing the appropriate income at an overall capitalization rate, which represents the income pattern, value change, and yield rate.

Upon projecting the amount, timing, and duration of the cash flows to the property being appraised, the appraiser must identify the pattern that the cash flow is expected to follow during the holding period. Those patterns are either variable, level, increasing, or decreasing annuities. For a level annuity where a property is expected to generate a level net utility operating income for a finite period of time and then be resold at the original purchase price, the property can be valued with capitalization in perpetuity by dividing the periodic income by the appropriate discount rate. In this model the discount rate and the overall capitalization rate are the same.⁶¹

When the net income consists of a fixed amount that represents the return of capital (depreciation expense) plus a declining amount representing the return on the capital remaining in the investment, classic straight-line capitalization can be used to value the property.⁶² In this model, as with the level perpetuity, the discount rate and the overall capitalization rate are equal when properly applied to a utility's net cash flow.

If the cash flow pattern is expected to be in the form of a variable annuity each individual income flow will be discounted into an indication of present worth at the appropriate discount rate for the holding period. Further, the appraiser discounts any remaining value in the investment at the end of the holding period and adds the total present worth of the variable cash flows to the present worth of the future value at the end of the holding period. The total represents the present worth of the total property.

The application of the DCF model for a variable annuity can be accomplished using the following formula.

$$Value = \frac{I_1}{(1+r)^1} + \frac{I_2}{(1+r)^2} + \frac{I_3}{(1+r)^3} + \dots + \frac{I_n}{(1+r)^n}$$

⁶⁰ *The Appraisal of Real Estate*, 13th ed., (Chicago: Appraisal Institute, 2008), 519-520.

⁶¹ *Ibid.*, 560.

⁶² *Ibid.*, 560.

In this formula, *I* equals income or cash flow in periods 1 through n, and *r* equals the discount rate. Where income has the characteristics of a perpetuity or of a classic straight line capitalization model, the universal capitalization formula, *Value = Income ÷ Rate*, can be used. In this case the overall capitalization rate will equal the discount rate.

To derive *equity yield rates* from market information, yield capitalization permits some things that would not be proper when using direct capitalization. For example, generally accepted appraisal texts record how it is permissible to use stocks and bonds for determination of equity yield rates in alternative investments when appraising real estate.

An investor may compare the expected equity yield on a real property investment with the yields on alternative investments with commensurate risk (e.g., stocks and bonds) and with a lender's yield on mortgages secured by similar real property.⁶³

The Appraisal Institute goes on to state:

To estimate equity yield rates, appraisers must do market research. This research can take many forms and may include one or more of the following analyses...Comparison with the equity yield rates achieved in alternative investments of comparable risk such as stocks and bonds...⁶⁴

An important difference between yield capitalization and direct capitalization is that in yield capitalization when deriving the equity yield rate, i.e., the cost of capital, it is entirely appropriate to use sales of stock (the capital asset pricing model, DCF or Gordon growth model, or risk premium models) to derive the equity yield rate. However, when using direct capitalization, it is absolutely inappropriate to use sales of stock (earnings-price ratios) to derive equity capitalization rates. The reason is simple; equity cap rates are intended to be ratios between income and value while equity yield rates are not. Thus, it is critical that the sales used in deriving those ratios be virtually identical to the property being appraised. Stocks, quite simply, are not comparable to tangible assets as discussed in the quotation on page 94. Because stock sales used to derive equity yield rates are used to indicate relative risk between investments, it is entirely appropriate to use stock sales to derive equity yield rates.

Estimation of Income to Capitalize

The income level capitalized in the income approach is usually called *cash flow*. In fact, as mentioned previously on page 13, Dr. William Kinnard, MAI explains that all of the

⁶³ *Ibid.*, 118-119.

⁶⁴ *Ibid.*, 119.

annual “income” figures used in appraising income-producing properties are *cash flows* rather than accrual accounting incomes. Cash flow can be defined in a number of ways, however for appraisal purposes it generally consists of income necessary to satisfy the cost of capital plus depreciation expense. Commercial and general appraisers recognize this level of income as simply ***net operating income***. Utility appraisers know that the definition of “net utility operating income” for public utilities and commercial properties is different in one important aspect. For public utilities the level of income reported as “net utility operating income” is only that income available to pay the utility's cost of capital, while for commercial properties “net operating income” includes not only the level of income available for debt and equity, but also the income to recapture a portion of the wasting asset (*otherwise known as depreciation expense*).

In general commercial appraisals cash flow is typically defined as simply net operating income (as defined for general commercial appraisal purposes), which is the income available for debt and equity and the depreciation expense. For an illustration of this type of analysis, refer to *The Appraisal of Real Estate*, 13th edition, page 542-543.

For public utility appraisal, cash flow is often defined as net utility operating income (defined as the income available to pay the cost of capital) plus depreciation expense and the current portion of deferred income taxes. This definition of cash flow is sometimes referred to as ***gross cash flow*** because there is no deduction for capital expenditures to keep the utility operating. Thus this cash flow model will have a limited life duration. In other words, gross cash flows cannot continue indefinitely without significant new investment to keep the utility operations ongoing.

Another variation of this same general definition of cash flow for a public utility is called ***net cash flow***, which is the gross cash flow less capital expenditures. Some refer to this as gross revenue less all cash disbursements except interest expense. For the appraisal of public utilities where it is assumed that the amount of capital reinvestment is equal to the depreciation expense, *net cash flow* can be defined simply as utility net utility operating income. For the appraisal of a public utility as a going concern, net cash flow is usually the best level of income to work with. The purpose of this cost of capital study is to provide the cost of capital, which can be used to capitalize the net cash flow for the typical interstate natural gas pipeline company for the purpose of estimating market value.