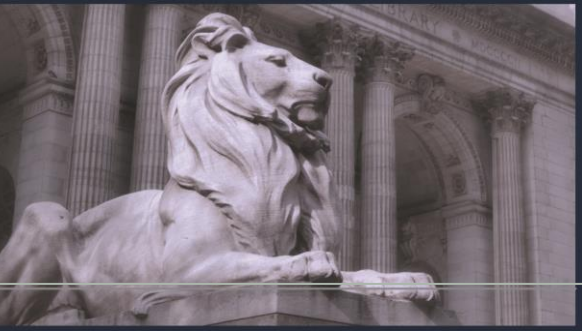


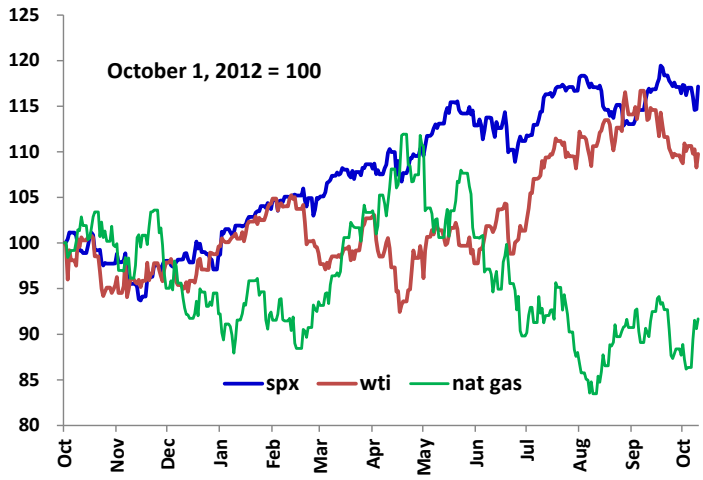
The Devil is in the Numbers

SCURA PALEY AND COMPANY

October 15, 2013

Charles Wyman (212) 596-3377
cwyman@scurapaley.com

LTM Market Performance



Source: Scura Paley, Bloomberg.

Market Data	31-Dec-12	31-Aug-12	30-Sep-13
U-6 Unemployment	14.4%	13.7%	13.7%
Existing Home Sales (mm p/a)[1]	4.90	5.39	5.48
Loans & Leases (bln)	$7,200	$7,319	$7,318
Rail Loadings (000)	1,011	964	1,028
US 10yr Fed Funds Spread	167	272	255
CPI (% y-o-y)[1]	1.89%	1.70%	1.77%
EUR/USD	$1.32	$1.32	$1.35
USD/JPY	¥86.8	¥98.2	¥98.3
CNY/USD	CN¥6.23	CN¥6.12	CN¥6.12
WTI (bbl)	$92.27	$107.65	$102.33
Henry Hub (mcf)	3.59	3.58	3.56
Gold (oz)	1,676	1,396	1,327

Returns	30-Sep-13	ytd	ltm
U.S. Investment Grade	0.87%	-2.46%	-1.25%
U.S. High Yield	0.99%	3.78%	7.15%
S&P 500	3.17%	19.79%	19.33%

1. Economic data as of August 31, 2013.
Source: Scura Paley, Bloomberg, BAML Indices

Signal from the Noise

- In this month's research note we present our approach for valuing stocks in the Exploration & Production Energy Sector ("E&P").
- An E&P stock pick represents three bets: first is the overall equity market (S&P 500, Dow, etc.), second is the underlying commodity (oil), and third is the company's current financial performance relative to its peer group and its own performance in prior periods.
- A comparison of the three bets shows that company-specific performance accounts for less than half of investment returns. How an investor choses to invest in a stock comes after the decision of how to invest in the market and how to invest in oil.
- Our benchmark for measuring financial performance of E&P companies is full cycle economics, which is the ratio of average realized price per barrel of oil equivalent ("boe") to the sum of cash production and reserve replacement costs. Excess return over the Energy Select SPDR Exchange Traded Fund ("XLE") is the benchmark for market performance. Over time companies with the highest full cycle economics generate the highest returns.
- Preliminary analysis indicates that full cycle economics may be used as a fundamental and technical benchmark to differentiate between E&P stocks after investors have decided which bets to make on the market and on oil.

 Please see important disclaimers and analyst certifications on the last page of this report. Consensus forward estimates are used in analysis; past performance is not indicative of future results.

Benchmarks for Valuation

Every stock price and every valuation is a bet. To identify the signal in the noise—the unanticipated upside not already embedded in the price of a stock—we need a framework, a method to quantify what we assume to be true in order for the price to make sense.

The focus of our analysis in this note will be independent exploration & production energy companies ("E&P"), whose primary activity is the exploration and production of oil and gas reserves.

How are E&P companies valued by the market? The first benchmarks we considered were the market itself, the S&P 500 ("SPX"), and WTI oil prices ("WTI"). Here, and throughout this note, we use the Bloomberg NRGCL12 index of rolling 12-month futures contracts for WTI, because spot prices (the futures contract closest to expiration) are often distorted by hedging activities and derivative trading prior to contract expiration. We first selected a group of 30 E&P companies with equity market values over $1 billion and calculated their daily stock returns, adjusted for dividends and splits, back to December 2006. We then ran a principal component analysis across these returns.

Principal component analysis is a statistical procedure that converts a large set of potentially correlated variables into a smaller set of linearly uncorrelated constructed variables that contain the most important information about the data. The first component explains the most variation in the data, the second explains the most variation that is not explained by the first component, and so on for each successive component. In this case, we analyzed the daily returns of 30 E&P companies across some 1,600 trading days to calculate the first component, which can be interpreted as the common factor of the returns of our 30 E&P stocks. An intuitive explanation of this factor is that it represents the statistically weighted average of all the returns of the group. For purposes of comparison, we scaled this factor to have the same mean and variance as SPX and for the rest of this note refer to it as the E&P factor.

To test the significance of our benchmarks in E&P sector returns, we ran separate regressions of both the E&P factor and XLE on SPX, WTI, and SPX and WTI together. We also ran a regression of the E&P factor on XLE. The results of this analysis, which appear in Exhibit 1 below, strongly suggest that any bet on the E&P sector is first and foremost a bet on the market. This is apparent from the regressions of both the E&P factor and XLE on SPX.

A bet on the E&P sector is first and foremost a bet on the market

Another key observation from Exhibit 1 is the high correlation between the E&P factor and XLE. This shouldn't come as a surprise since both indices share 17 companies, but in the case of XLE they are weighted by market value and represent only 30% of the index versus a statistical weighting of well over 50% in the E&P factor. XLE also includes

companies from across the spectrum of energy sectors in addition to E&P, including refining and marketing, oilfield services, pipelines, and major integrated oil companies. Despite these differences, a comparison of rolling 60-day returns for E&P factor and XLE reveals virtually identical return profiles with correlations consistently above 90%. For the purposes of benchmarking excess returns, the E&P factor and XLE are functionally the same.

For benchmarking excess returns due to fundamental performance, our E&P factor and the Energy Select SPDR ETF (XLE) are functionally equivalent

Exhibit 1

Regression Analysis of E&P Factor & XLE Returns 2007-2013

variable explained *(Y)*	predictor*(s) (X)*	beta *(coefficient)*	R^2
E&P Factor	*SPX*	0.80	0.639
XLE	*SPX*	1.22	0.742
E&P Factor	*WTI*	0.46	0.397
XLE	*WTI*	0.60	0.339
E&P Factor	*SPX*	0.65	0.751
	WTI	0.27	
XLE	*SPX*	1.06	0.808
	WTI	0.29	
E&P Factor	*XLE*	0.65	0.856

Past performance is not indicative of future results.
Source: Scura Paley, Bloomberg

What may appear surprising from the R^2 statistics in Exhibit 1 is that SPX seems to explain more of the variations in the E&P factor than WTI. On closer examination, this makes intuitive sense. SPX and WTI returns tend to reflect current and anticipated economic activity and for the most part trade together. When this relationship breaks down—such as the collapse of oil prices in the third quarter of 2008 or the Arab Spring and revolution in Libya in 2011—WTI assumes a greater role in E&P equity returns.

Exhibit 2

Months With Absolute Value of Returns Greater than 5% & 10% 1998-2013

	total 10% moves	coincide with 10% move in: WTI	coincide with 10% move in: SPX	total 5% moves	coincide with 5% move in: WTI	coincide with 5% move in: SPX
XLE	23	12	3	71	47	24
SPX	4	2		45	24	
WTI	28			95		

Past performance is not indicative of future results.
Source: Scura Paley, Bloomberg

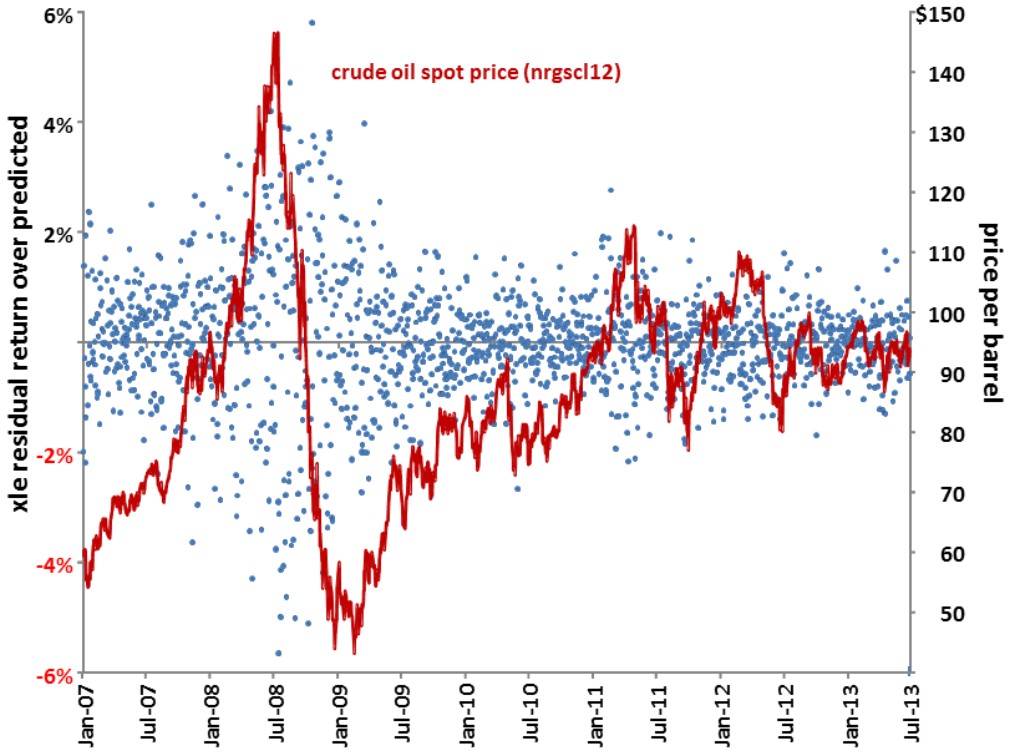
Exhibit 2 above shows the number of months from December 1998 through September 2013 when WTI, SPX, and XLE posted positive or negative returns equal to or greater than 5% and 10%, which we arbitrarily define as big moves, and indicates how many coincided with 5% and 10% moves in each of the others.

Over 177 months from 1998 through 2013, 12 of the 28 10% moves in WTI coincided with 10% moves in XLE, and 2 of 4 in SPX. At the lower threshold of 5%, roughly a third of big moves in XLE match big moves in SPX versus two thirds with big moves in WTI.

To show this relationship graphically, we ran a regression in Exhibit 3 below of XLE daily returns on SPX daily returns from January 2007 through July 2013 and plotted the spot price for crude oil on the residuals of XLE returns not predicted by the results of our regression on SPX. These residuals represent, in other words, the variation in XLE returns not explained by the variation in SPX returns. Large residuals occur when the correlation between XLE and SPX is low; residuals are small when XLE and SPX are highly correlated.

We can see in Exhibit 3 that when WTI trades in a relatively defined range, the overall direction of SPX returns plays a much larger role than WTI in XLE returns, because the residuals are much smaller. But when WTI makes a significant move to new trading levels—as it did in the first and third quarters of 2008, the first, second, and fourth quarters of 2011, and the second quarter of 2012—the role it plays is much larger.

Exhibit 3
Crude Oil Spot Price versus Residuals of XLE Daily Returns Regressed on SPX



Past performance is not indicative of future results.
Source: Scura Paley, Bloomberg

On the basis of this analysis, we will use XLE as our proxy both for the market bet and for the bet on oil prices. To determine what portion of an individual company's returns is not explained by those bets, we narrowed our group of 30 companies down to what in our opinion are the 19 most significant based on their size and the requirement that the vast majority of their revenues were derived from exploration and production activities. For this group, we computed the fraction of each company's return (R^2) that can be explained by the E&P factor, SPX, WTI, SPX and WTI together, and XLE.

Exhibit 4

R^2 of Daily Company Returns Explained by Benchmarks 2007-2013

		11-Oct-13	R^2				
company	tkr	ytd returns	E&P factor	spx	wti	spx + wti	xle
Anadarko Petroleum	APC	28.9%	0.72	0.53	0.28	0.60	0.72
Apache Corp.	APA	12.8%	0.80	0.57	0.30	0.64	0.79
Cabot Oil & Gas	COG	47.9%	0.72	0.44	0.29	0.53	0.65
Chesapeake Energy	CHK	61.4%	0.70	0.41	0.24	0.47	0.61
Cimerex Energy	XEC	73.2%	0.73	0.48	0.28	0.56	0.65
Concho Resources	CXO	36.9%	0.65	0.40	0.26	0.48	0.54
ConocoPhillips	COP	28.3%	0.71	0.64	0.27	0.68	0.82
Continental Resources	CLR	52.4%	0.71	0.37	0.32	0.49	0.57
Denbury Resources	DNR	13.3%	0.78	0.49	0.34	0.59	0.70
Devon Energy	DVN	18.1%	0.79	0.54	0.30	0.61	0.77
EOG Resources	EOG	48.6%	0.73	0.49	0.29	0.57	0.70
Linn Energy	LINE	(18.1%)	0.36	0.24	0.16	0.29	0.31
Marathon Oil	MRO	15.4%	0.69	0.60	0.27	0.65	0.74
Newfield Exploration	NFX	8.9%	0.75	0.48	0.31	0.57	0.67
Noble Energy	NBL	32.5%	0.77	0.57	0.30	0.64	0.77
Pioneer Natural Resources	PXD	83.0%	0.79	0.52	0.35	0.63	0.70
QEP Resources[1]	QEP	(2.5%)	0.60	0.46	0.24	0.48	0.66
Range Resources	RRC	25.8%	0.70	0.40	0.27	0.49	0.61
Whiting Petroleum	WLL	49.1%	0.79	0.47	0.35	0.59	0.67
mean			0.71	0.48	0.28	0.56	0.67
median			0.72	0.48	0.29	0.57	0.67
high			0.80	0.64	0.35	0.68	0.82
low			0.36	0.24	0.16	0.29	0.31

1. QEP statistics calculated from June 2010, the date of the company's IPO.

Past performance is not indicative of future results.

Source: Scura Paley, Bloomberg

Company-specific performance accounts for less than half of the company's return

The results of this analysis in Exhibit 4 above indicate a significant relationship. The E&P factor accounts for 60%-80% of the individual returns of almost all the companies, SPX accounts for 37%-64%, SPX with WTI 47%-68%, and XLE 54%-82%. The implication is that financial, company-specific performance accounts for less than half the company's

return. Only the excess returns over XLE may be attributed to the financial performance of an E&P company versus its peer group.

There are several plausible reasons for this outcome, although analysis of any of them falls outside the scope of this note, but the trend of increasing concentration of assets with institutional investors over the last two decades probably has a place in most of them.[1] Growth in assets at the level of an individual manager generally promotes diversification across an ever increasing number of stocks, and in aggregate ties their returns more closely to the flow of funds into and out of market benchmarks and the returns they subsequently generate.

Measuring Financial Performance

For companies that find and produce non-renewable resources like oil, enterprise value is the market value of their reserves

Any discussion of financial performance should begin with valuation. The most common measure of valuation—P/E multiples, the ratio of enterprise value[2] to revenues, to net capital, and to EBITDA—are widely understood. However, for companies that must find, develop, and produce oil, gas, or any other non-renewable natural resource, and then repeat the cycle to replace that production (since stocks trade on future expectations), those multiples don't reflect the economics of their business model. For these companies, enterprise value is the market value of their net assets, which is the market value of their reserves, but does not include the future cost of producing them at an economic profit.

For the 12 months ended June 30, 2013, cash production costs for the 19 companies on our list came in at $24.23 per barrel of oil equivalent ("boe"). Barrel of oil equivalent indicates a number that includes natural gas reserves converted at 6,000 cubic feet (6 mcf) per barrel. These costs include lease operating expenses, severance and other production related taxes, corporate administrative overhead, interest expense, capitalized interest, cash taxes, and dividends paid to stockholders.

The calculation of cash production cost is relatively straightforward. Reserve replacement cost is not. Higher prices year-over-year make reserves profitable that were not economic at lower prices. Higher prices often generate positive revisions, while lower prices create the opposite effect. Some reserves can be identified, developed, and produced in one year; others, such as deepwater offshore reserves, require several years of development before they become productive. The formula below shows how we calculated reserve replacement costs in 2012.

$$\text{reserve replacement cost 2012} = \frac{\text{costs incurred 2010-2012} + \text{capitalized interest 2010-2012} + \text{NPV future development cost in 5 equal installments @10\%}}{\text{total boe reserves added, net of revisions, 2010-2012}}$$

To reduce period-to-period variability and to reflect multi-period development costs more accurately, we include in our calculations total costs incurred for acquisitions, exploration, and development over the prior three years, less interest capitalized over the same period (since it is included in production costs), plus future development costs for the last year taken in five equal future annual installments discounted at 10% per year. We divide that figure by total reserves added over the same period net of revisions to calculate reserve replacement cost per boe. For the year ended December 31, 2012, the reserve replacement cost for our 19 companies was $28.35.

Total cost, which is the sum of reserve replacement plus cash production costs, comes to $52.58 per boe. Dividing average price realized at the wellhead by total cost, we can calculate the economic value added or lost by a company each period. We define the ratio of realized price to total cost as full cycle economics[3], because it includes all costs incurred over the full economic cycle of reserve production, sale, and replacement. For the purposes of this note, we refer to this definition as book full cycle economics because it is calculated from the financial statements and not market data.

$$\text{book full cycle economics} = \frac{\text{realized wellhead price}}{\text{production cost + reserve replacement cost}}$$

Companies with full cycle economics greater than 1 (or 100% as we express it) have added to their value over the period, just as companies with full cycle economics less than 1 have lost value. A value of 100% is breakeven for valuation purposes.

For realized price, we use average prices before hedging to make results more directly comparable across companies and between periods, quantifying, as best we can, the economics of the underlying oil and gas resource. After transportation costs and after the discount for natural gas on a boe-equivalent basis (with an average latest-12-month ("ltm") price of $22 per boe versus an oil price of $82 for the group), the average ltm wellhead price has been $50.75 per boe. At $52.58, the average total cost to produce and replace a barrel equivalent of oil has been more than the wellhead realized price for the last year.

Exhibit 5 below lists realized price and cash production costs by company for the trailing 12 months ended June 30, reserve replacement costs as of December 31, 2012, and enterprise value per boe as of October 4. These numbers are the inputs for the calculation of full cycle economics in the last column, which we've expressed in percentage terms. This is our benchmark of financial performance.

Exhibit 5

Valuation and Summary Operating Data *(LTM Jun-13)*

company	tkr	11-Oct-13 enterprise value/boe	per boe price	per boe cash cx	per boe repl cx	full cycle economics
Anadarko Petroleum	APC	$22.25	$46.93	$16.32	$21.44	124%
Apache Corp.[1]	APA	16.49	58.74	26.39	40.51	88%
Cabot Oil & Gas	COG	25.90	24.49	6.89	8.91	155%
Chesapeake Energy[2]	CHK	13.20	26.48	14.56	25.19	67%
Cimarex Energy	XEC	25.24	42.69	14.10	16.68	139%
Concho Resources	CXO	33.76	63.54	25.06	26.76	123%
ConocoPhillips[3]	COP	12.27	63.33	37.85	35.19	87%
Continental Resources	CLR	31.88	69.22	20.00	22.93	161%
Denbury Resources[4]	DNR	22.16	93.48	50.48	16.88	139%
Devon Energy	DVN	10.33	30.59	16.26	29.46	67%
EOG Resources	EOG	29.74	52.58	15.69	45.21	86%
Linn Energy	LINE	15.60	38.65	36.64	17.26	72%
Marathon Oil Corp.	MRO	15.36	71.37	53.70	44.61	73%
Newfield Exploration	NFX	12.68	52.19	32.08	58.11	58%
Noble Energy	NBL	22.71	47.65	19.22	21.52	117%
Pioneer Natural Resources	PXD	26.84	49.97	23.11	36.80	83%
QEP Resources	QEP	13.03	31.48	15.21	24.61	79%
Range Resources[5]	RRC	14.92	27.72	12.37	8.32	134%
Whiting Petroleum[6]	WLL	28.80	73.06	24.36	38.27	117%
Group average		$20.69	$50.75	$24.23	$28.35	97%

1. APA pro forma for sale of 239 mmboe GOM shelf reserves for $3.75 billion.
2. CHK pro forma for sale of 140 mmboe Mississippi Lime JV to Sinopec for $1.04 billion.
3. COP pro forma for sale of 42 mmboe Cedar Creek reserves for $989 million.
4. DNR pro forma for acquisition of 42 MMBOE Cedar Creek reserves for $989 million.
5. RRC pro forma for sale of 137 bcfe of reserves for proceeds of $257.9 million.
6. WLL pro forma for sale of 35 mmboe of reserves for $860 million.

Past performance is not indicative of future results.

Source: Scura Paley, Bloomberg.

Full cycle economics is the benchmark we use to measure E&P financial performance

Financial Performance and Market Returns

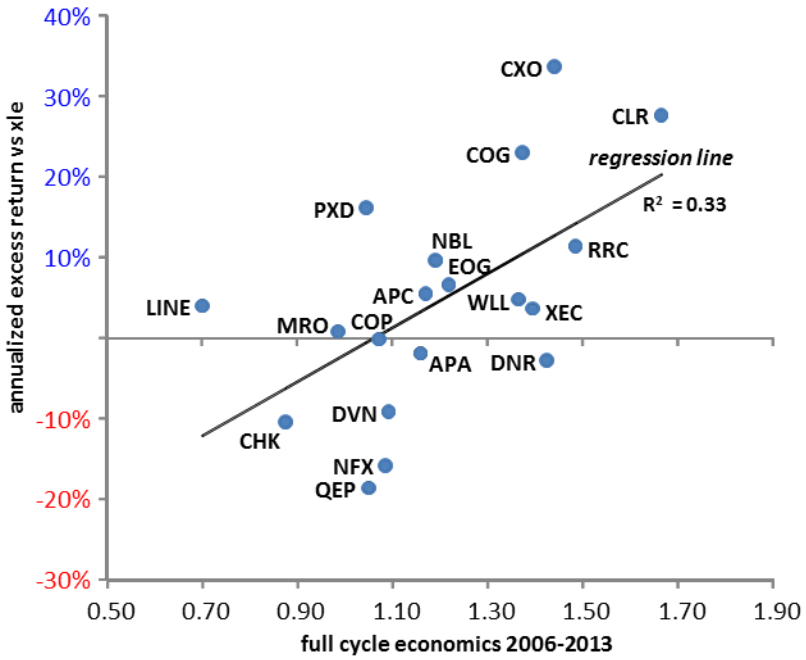
To evaluate the significance of the benchmarks, we compared enterprise value per boe and full cycle economics to excess returns over XLE. We assembled the data for this analysis from company financial reports back to 2006 for trailing 12-month cash production costs and back to 2003 to calculate reserve replacement costs for 2006.

With only 26 periods in a series for each company, we pooled data for the 19 companies over all 26 periods and ran a panel regression to investigate the relationship between excess returns and full cycle economics. The results of the analysis identified a statistically significant, positive relationship between excess returns and full cycle economics and a statistically significant negative relationship with enterprise value per

boe. These results are consistent with common sense. Stocks post lower subsequent returns for companies with richer valuations and higher returns for companies with better financial performance.

Exhibit 6 below compares full cycle economics by company, calculated over the entire period of 2006-2013, to the annualized excess return over XLE. The relationship is unmistakable and relatively strong: over time companies with the highest full cycle economics generate the best returns.

Exhibit 6
Full Cycle Economics versus Annualized Excess Return over XLE 2006-2013



Past performance is not indicative of future results.
Source: Scura Paley, Bloomberg.

Over time companies with the highest full cycle economics generate the highest returns

Analysis of full cycle economics derived from aggregate data compiled over a 7-year period provides evidence of a relationship between this metric of financial performance and investment returns, but it has limited value as a signal of when to make an investment. As we noted earlier, however, enterprise value for an E&P company is essentially the market value of its reserves, which is the same as the market price of its reserve replacement cost. Put differently, the enterprise acquisition price per boe of an E&P company would become the reserve replacement cost of an acquirer with no other reserves.

Substituting enterprise value per boe for reserve replacement cost combines financial performance and valuation into one number. We refer to this figure as market full cycle

economics to distinguish it from book full cycle economics, which is based on our calculated reserve replacement cost.

$$\text{market full cycle economics} = \frac{\text{realized wellhead price}}{\text{production cost + enterprise value per boe}}$$

Since lower valuations lead to higher future returns and lower valuations lead to higher market full cycle economics, there should be a positive relationship between market full cycle economics and future returns.

Companies with higher market full cycle economics post statistically significant higher returns within 2-3 quarters

To evaluate the significance of this statistic, we compared it to excess returns over XLE, using the same data assembled for the earlier analysis of book full cycle economics. We ran another panel regression to see whether excess returns can be explained by market full cycle economics. The results of the analysis showed a statistically positive relationship two quarters later that weakened after three quarters. In other words, companies with higher market full cycle economics should post higher returns within 2-3 quarters.

At this point, we have not mentioned a significant source of stock returns, the role of catalysts, which are events that change a company's prospects or investors' perceptions of them. To identify catalysts, we look for fault lines in a company's financial profile that increase the likelihood of positive or negative surprises. For the E&P industry group our measures include how efficiently, or cheaply, a company produces its reserves, how effectively it replaces them at a reasonable cost, and whether it has the management, resources, and strategy to sustain performance over the long haul.

For example, in the last six years Linn Energy has grown its equity market value from under $2 billion to $8 billion at the end of June, delivering a compound annual return on its stock of 10%. Those returns and an enterprise valuation per boe of $17.73 place Linn in the middle of the pack of the 19 companies in our coverage group, even though over the same period the company had the lowest cumulative full cycle economics (at book) of 58%. In other words, the company built significant market capitalization without generating any current economic profit. Even at the current enterprise value of $15.51 per boe, Linn's market full cycle economics is only 71%, and since 2006 it has reached or exceeded 100% once, in September 2008, when valuations across the entire sector and the market were depressed during the financial crisis.

Linn achieved its extraordinary growth in value as a Master Limited Partnership ("MLP") paying a large dividend in a yield-starved investment environment. The dividend ensured investor demand whenever the company needed to issue stock to finance operations and acquisitions, and made shorting the stock expensive. An analysis of the company's sources and uses of cash over the period shows how the need to sustain earnings growth with acquisitions, while paying a large dividend, has made the company increasingly vulnerable to negative shocks. Since 2006, Linn has generated $1.7 billion

of cash from operations, issued or assumed in acquisitions $5.8 billion of new debt (net), and issued $6.3 billion of new equity for a total of $13.8 billion. Over the same period, the company has spent $11 billion on capital expenditures and acquisitions, net of divestitures, and $2.5 billion on dividends to shareholders—more on dividends than it generated operating cash flow. An informal inquiry of its hedging strategy by the SEC, which Linn announced on July 1, in connection with the proposed merger with Berry Petroleum precipitated a rapid 10% decline in the stock—ultimately more 20%—and perhaps called into question the sustainability of the company's operating strategy. Even with the modest recovery of the stock price in September along with improving prospects the company will complete its announced merger with Berry Petroleum, Linn nevertheless remains a fragile company and a dangerous stock.

The Market and Sector Call

An E&P stock pick is three bets: the market, oil, and company relative financial performance

A stock pick among E&P companies is not just one, but three bets. The first is the market, the second is oil, and the third is the company's relative financial performance. Whatever returns we expect for SPX must play a significant role in the returns we should expect for any of these stocks. If SPX trades down, there is a high likelihood that XLE and E&P stocks will trade down with it. How to hedge that risk through short positions in the SPX ETF ("SPY") or the SPX E-mini futures contract is beyond the scope of this note, but one approach would be to use the stock's beta as a guide to determine the size of the prospective hedge, and then adjust it after backtesting to check its effectiveness.

For the sector bet, both XLE and the subsector of E&P companies in SPX ("E&P") should gain support from a bullish outlook for WTI. We believe the likelihood is low that oil prices will shift down to a lower trading level as they did over a year ago. Barring some catalyst that triggers a slowdown in the global economy, we would expect WTI to trade at least in its current range of $90 to $110. In fact, it could move higher. Since September 2012, annualized GDP growth has accelerated from 0.1% in the fourth quarter to 2.5% in the second quarter of 2013, while implied demand for oil is up 4.6% year-over-year and crude oil inventories are flat to slightly down.[4]

A stronger, bullish signal may be found in the futures market, where WTI for delivery in November 2014 is quoted at $95.23, a discount of $7.78 to the November 2013 contract price of $103.01. This is a backwardated market where spot, or the prompt contract, is quoted higher than future prices, as opposed to a market in contango, where spot is quoted lower than future prices.

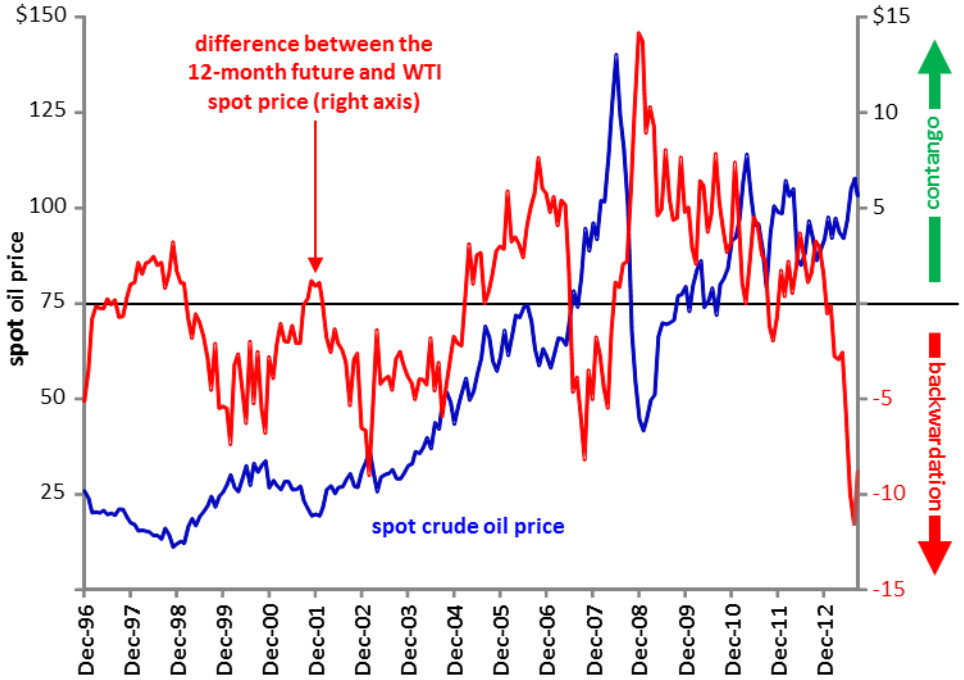
Intuitively, a backwardated futures curve would appear to be a bearish signal, forecasting lower prices in the future. But in a market for physical commodities where inventories are carried from one period to the next, any condition expected to influence the price of futures must have a similar effect on spot prices. The difference between

spot and futures is not a forecast, but rather a reflection of the state of supply and demand in the current market. When supply dominates demand, traders will offer down spot to eliminate inventory. Under normal conditions, the lower boundary price will be the cost of storing, insuring, and the cost of carry (the standard "Cost of Carry" model). When supplies are tight, traders buy the spot at any price to insure they have sufficient product to meet physical delivery commitments. This explanation is a gross simplification of the complexities involved in the trading, hedging, and storage of physical commodities, but it is consistent with the historical record and finds support in academic research.[5]

The difference between spot price and futures is not a forecast, but a reflection of the state of supply and demand in the market

Exhibit 7 below overlays month end WTI spot prices from December 1996 through September 2013 (left axis) with a plot of the difference between the price of the 12-month WTI futures contract and spot price (right axis). As the chart shows, shifts from contango to backwardation in the futures market tend to lead upward moves in spot prices.

Exhibit 7
Crude Oil Futures Term Structure versus Prompt Month Contract 1997-2013



Past performance is not indicative of future results.
Source: Scura Paley, Bloomberg.

Current backwardation in WTI futures support a bullish outlook for oil prices at or above current levels

In this framework, the significant move from contango to backwardation that has taken place in the market over the past year supports a bullish outlook for oil prices at or above current levels. After a return of 28% year-to-date through September versus 20% for SPX and 17% for XLE, E&P may be hard pressed to outperform either one in the

immediate future, but the subsector should at least keep pace with the support of strong WTI prices.

The Company Call

Our goal in picking stocks is to identify the upside not already anticipated in their price. For E&P stocks, the signal we're trying to find in the noise is their excess return on a risk-adjusted basis versus the average total return of the group. The appeal of market full cycle economics, as a metric to differentiate among the companies on our list, is that it combines a fundamental measure of financial performance, which is cash cost, with a current measure of valuation, which is enterprise value per boe.

Exhibit 8 below summarizes the valuation and performance metrics discussed in this note for the 19 E&P companies in our group, sorted in descending order by market full cycle economics.

Exhibit 8
Independent E&P Company Summary Valuation

		11-Oct-13	market returns since		enterprise	full cycle economics	
company	tkr	price	31-Dec-12	30-Aug-13	value/boe	book	market
Whiting Petroleum	WLL	64.67	49.1%	27.5%	$28.80	117%	137%
Apache Corp.	APA	87.95	12.8%	2.6%	16.49	88%	137%
Continental Resources	CLR	112.00	52.4%	20.1%	31.88	161%	133%
Denbury Resources	DNR	18.36	13.3%	5.5%	22.16	139%	129%
ConocoPhillips	COP	71.71	28.3%	9.1%	12.27	87%	126%
Anadarko Petroleum	APC	$95.46	28.9%	4.7%	22.25	124%	122%
Newfield Exploration	NFX	29.17	8.9%	20.0%	12.68	58%	117%
EOG Resources	EOG	178.99	48.6%	13.7%	29.74	86%	116%
Devon Energy Corp.	DVN	60.80	18.1%	6.4%	10.33	67%	115%
Noble Energy	NBL	67.00	32.5%	9.2%	22.71	117%	114%
QEP Resources	QEP	29.46	(2.5%)	6.9%	13.03	79%	111%
Cimarex Energy	XEC	99.60	73.2%	18.8%	25.24	139%	109%
Concho Resources	CXO	110.29	36.9%	14.1%	33.76	123%	108%
Marathon Oil Corp.	MRO	34.86	15.4%	0.7%	15.36	73%	103%
Range Resources	RRC	78.90	25.8%	4.5%	14.92	134%	102%
Pioneer Natural Resources	PXD	195.00	83.0%	12.1%	26.84	83%	100%
Chesapeake Energy	CHK	26.47	61.4%	2.9%	13.20	67%	95%
Cabot Oil & Gas	COG	36.75	47.9%	(6.1%)	25.90	155%	75%
Linn Energy	LINE	26.45	(18.1%)	11.1%	15.60	72%	74%
Group average			32.4%	9.7%	$20.69	104%	112%
Energy Select Sector SPDR	XLE	84.29	19.6%	3.5%			

Past performance is not indicative of future results.
Source: Scura Paley, Bloomberg

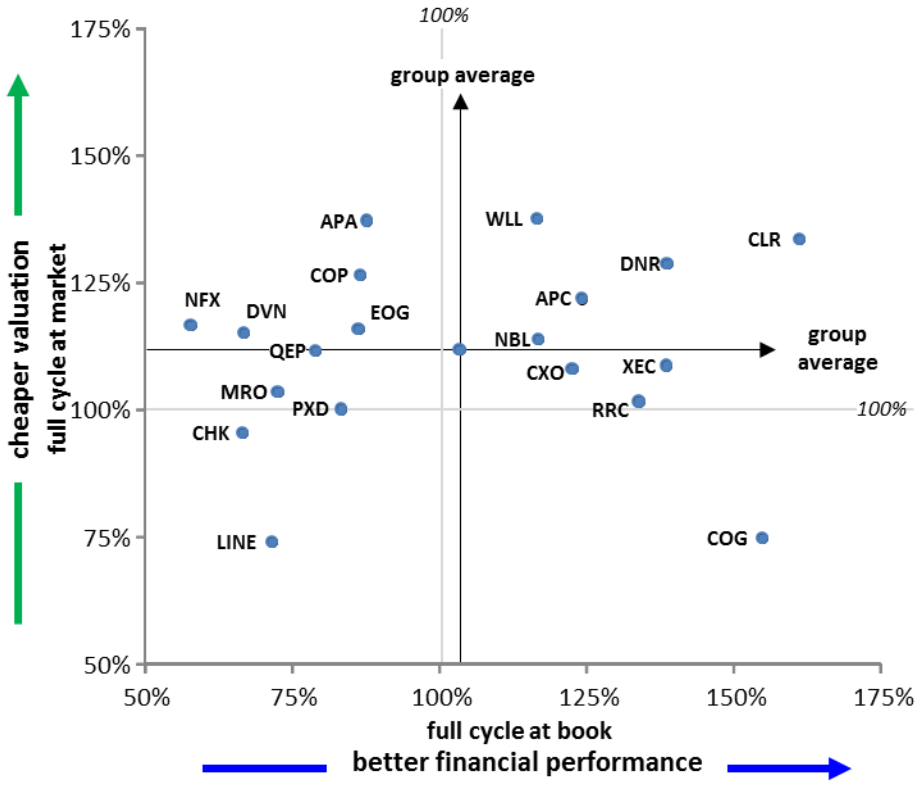
The columns under market returns list the returns for each stock for the year-to-date and the last month. Even with market full cycle economics greater than 100%, companies whose stocks have outperformed the XLE by a factor of two to three times

year-to-date, like Cabot Oil & Gas, Cimerex Energy, and Pioneer Natural Resources, are less likely to outperform in the future as investors look for less popular stocks with cheaper valuations. In addition to the valuation measure of enterprise value per boe, we provide both figures for full cycle economics, at book and at market.

Every investor, of course, looks for companies where valuation appears cheap relative to performance. For companies with full cycle economics over 100%, fundamental analysis would focus on the sustainability of current cost structure, prospects for future production growth, and how badly valuation and recent appreciation of stock price limit potential for outperformance. For companies with full cycle economics below 100%, one would also look for trends that would support a recovery in performance.

A visual presentation of the data provides additional insight into how market valuation reflects performance. The benchmark for financial performance is book full cycle economics, which measures how effectively a company generates economic profit above its cost of production and reserve replacement. Market full cycle economics is the benchmark for valuation, a market measure of financial performance.

Exhibit 9
Book versus Market Full Cycle Economics *(11-Oct 13)*



Source: Scura Paley, Bloomberg.
Past performance is not indicative of future results.

Exhibit 9 above plots market against book full cycle economics by company with one axis centered on 100% and a second axis centered on average results for the group. Companies in the upper right hand quadrant appear to have edge in value for performance; companies in the lower left much greater risk in their valuation.

The position an investor takes with any of these stocks ultimately depends on the role it is expected to play in a given portfolio. That would include its risk profile relative to the overall risk of the portfolio, the expected return, the time horizon of that return, and its correlation with other risk positions in the portfolio. Every portfolio is unique, and any one of these stocks can play a number of different roles. To guide those choices, we review the investment thesis and outlook for each company at the end of this note.

Up to this point we have focused the analysis of market full cycle economics as a measure of fundamental performance and value. To determine whether it has any value as a technical signal of when to buy or sell an E&P stock, we modeled a crude mechanical investing strategy that triggers a purchase at the end-of-day settlement price when market full cycle economics moves above 100%, and a sale when it falls below. At the end of the day, the strategy either has a long position or no position ("flat") in the stock; it does not short the stock, which is why we refer to it as a long-flat strategy in this note.

We backtested this model with a representative sample from our group against a long-only position in each stock and against XLE from December 1996, or whenever the stock began trading publicly in its current form, through August 2013. To compare the different strategies, we calculated the annual returns over the relevant period of the cumulative P&L on the average daily capital. For the sample we analyzed, Exhibit 10 below lists the start date from which we calculated our returns, the annualized returns of each strategy, and the performance of the long-flat strategy versus the other two.

A mechanical trading strategy of a stock based on market full cycle economics generally outperforms XLE and a long-only position in the same stock

Exhibit 10
Returns for Market Full Cycle Long-Flat Strategy Versus Long-Only Strategy and XLE

		annualized returns			returns vs	
company	period	long-flat	long	xle[1]	long	xle[1]
Anadarko Petroleum	31-Dec-96	6.44%	6.41%	5.55%	0.04%	1.38%
Cabot Oil & Gas	31-Dec-96	11.83%	11.58%	5.55%	0.24%	7.61%
Devon Energy	31-Dec-96	3.68%	3.78%	5.55%	-0.10%	-1.36%
Pioneer Natural Resources	31-Dec-97	9.96%	9.74%	5.55%	0.22%	5.54%
Denbury Resources	31-Dec-97	4.31%	5.14%	5.55%	-0.83%	-0.50%
Cimarex Energy	1-Oct-02	10.39%	8.38%	7.01%	2.02%	3.38%
Concho Resources	2-Aug-07	15.90%	15.45%	2.94%	0.45%	12.96%

1. From December 1999, when XLE began trading, except for Cimerex Energy & Concho Resources.

Past performance is not indicative of future results.
Source: Scura Paley, Bloomberg.

The results of the analysis, while unscientific, suggest that even in a mechanical trading strategy, market full cycle economics generally outperforms a long-only position, and, more significantly and more substantially, outperforms XLE. The two cases where it underperforms reveal the weakness of any mechanical, value-based investment strategy, such as this one, because it triggers purchases that become cheaper in a falling market and sales of money-making positions in a rising one.

An actively managed strategy would implement, independently of any signal, rules to remedy the more salient weaknesses of a mechanical strategy. Examples would include sell stops and hold until loss limits, among others. Even for strategies that do not employ trading rules in their investment process, however, market full cycle economics provides what appears to be a leading indicator of future returns in addition to a measure of fundamental performance and valuation risk.

Signal in the Noise

If we don't measure the bets we make in a stock, how can we manage them? How do we screen for ideas? How do we size our positions? How and when do we hedge our risks?

We've tried to provide here a framework for identifying the unanticipated upside not already embedded in the price of a stock—the signal in the noise—using the E&P industry group as an illustration. There are broader applications beyond E&P stock selection, which is a subject we will explore in future notes.

1. For a discussion of the growth of assets among institutional investors see Working Group established by the Committee on the Committee on the Global Financial System, (2007). *Institutional investors, global savings and asset allocation.* CGFS Papers No. 27. Bank for International Settlements. www.bis.org/publ/cgfs27.pdf.
2. Enterprise value = equity market value + debt + preferred stock – cash and cash equivalents.
3. Full cycle economics is a term that has some currency in oil & gas industry literature, but not in the sense we define it here. A more common usage provides a metric for evaluating the economics of a specific oil and gas resource and includes in the calculation only lease operating expense, production taxes, and finding and development costs for that resource. Our definition is broader and seeks to create a metric for evaluating the financial performance of the entire company. For an example of more common usage see Wilson, Dan L. (1991), *Full-Cycle Economics Helps Focus Programs, Financial Performance*, Oil & Gas Journal, Volume 89, Issue 26.
4. Per Bloomberg GDP CHWG, DOESCRUD, and DOIDCRUD indices as of June 30, 2013.
5. For a detailed discussion of carrying charges, trading, and hedging in futures markets see Working, Holbrook (1948), *Theory of the Inverse Carrying Charge in Futures Markets,* The American Farm Economic Association, Volume XXX, No. 1 pp. 1-28, and Working, Holbrook (1953), *Futures Trading and Hedging,* The American Economic Review, Vol. 43, No. 3, pp. 314-343.

Charles Wyman
(212) 596-3377
cwyman@scurapaley.com

Company Notes

company	reserves/production		investment thesis
Anadarko Petroleum (APC)	production (mboepd) / %oil reserves (mmboe)/ %oil developed full cycle at market/book reserve locations: Rockies Texas / Gulf Coast Gulf of Mexico Mid-Continent	749/41% 2,560/46% 74% 123%/124% 20% 18% 16% 14%	With the costs related to Deepwater Horizon in the past and a diverse portfolio of domestic assets and offshore prospects, APC appears well positioned to continue steady growth at a full cycle profit. Current valuation appears cheap in comparison with peers in the context of current financial performance. Recent flooding in Colorado forced APC to halt operations temporarily in the Wattenberg/DJ Basin, but the slowdown should have a relatively minor impact on production. Dynamic domestic plays in Eagle Ford and horizontal Wattenberg, combined with production from new wells in Ghana and Algeria should support annual production growth of 6%. Extensive offshore operations offer substantial upside potential, especially in the Gulf of Mexico and offshore Eastern Africa. APC faces what it believes to be a maximum liability from litigation of $1.4 billion (versus a $14 billion claim before interest by the plaintiffs) over the bankruptcy of Kerr-McGee's TO_2 subsidiary, Tronox, which was spun off before the company acquired Kerr-McGee in 2006. Final post-trial briefs were filed in January 2013 and a decision from the court is expected in 1-2 quarters. Investor concerns over event risk may warrant caution for the stock, but a case can be made that the current attractive valuation already reflects the expected potential loss.
Apache Corp (APA)	production (mboepd) / %oil Reserves (mmboe) / %oil developed full cycle at market/book reserve locations: Texas / Gulf Coast Canada Australia / NZ Africa / Middle East Mid-Continent	790/54% 2,852/51% 70% 137%/88% 28% 19% 12% 10% 9%	APA's solid operational performance appears to have been overshadowed by concerns over political unrest in Egypt and the company's valuation has suffered as a result. Despite the ongoing turmoil, there have been no interruptions in local production and the company recently made a new discovery in the concession. Investors' concerns over political instability now appear overblown after the recent sale to Sinopec of a 33% interest in the Egyptian operation for $3.1 billion. Those proceeds together with another $3.75 billion from the sale of assets in the Gulf of Mexico shelf substantially exceed the company's stated goal of $4 billion in divestitures in 2013. These funds provide considerable financial flexibility and should buoy market sentiment. Annual production volume will be led by growth from operations in Texas (Permian Basin: Midland, Wolfcamp, Cline), the Mid-Continent (Granite Wash, Marmaton, Cleveland), and new wells in the North Sea.
Cabot Oil & Gas Corporation (COG)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book reserve locations: Appalachian Texas / Gulf Coast Mid-Continent	174/4% 640/4% 60% 75%/155% 60% 24% 16%	COG appears fully valued with an enterprise value in the most expensive third of the group and market full cycle economics near the bottom. Current valuation limits upside potential and increases downside risk despite an undeniable track record of operational success and record production growth. The company is on track to meet its forecast of 40% production growth in 2013 largely from drilling in the Marcellus and is expanding operations in Texas (Eagle Ford, Pearsall) and the Mid-Continent (Marmaton). COG's prospects are tightly bound to natural gas prices with only 4% of its production stream from oil.

Company Notes

company	reserves/production		investment thesis/risks
Chesapeake Energy Corporation (CHK)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book <u>reserve locations:</u> Texas / Gulf Coast Mid-Continent Appalachian Rockies	677/25% 2,615/30% 57% 95%/67% 35% 28% 26% 11%	The Initial results of the commitment to financial discipline by Chesapeake's new CEO, Doug Lawler, indicate that capital spending will be limited to cash flow. The strategic shift from gas to oil production has required significant investment and limits the company's ability to participate in emerging trends as aggressively as more flexible peers. Margins remain slim and full cycle costs per barrel exceed average realized price. The primary drilling focus is on unconventional oil plays in the Anadarko Basin (Granite Wash, Cleveland and Tonkawa), Eagle Ford, and Utica. CHK has been expanding operations in Eagle Ford with favorable results. Production growth is expected to approach 3% in 2013, led by a 25% increase in oil production.
Cimarex Energy Co. (XEC)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book <u>reserve locations:</u> Mid-Continent Texas / Gulf Coast	114/50% 376/45% 80% 107%/139% 68% 32%	XEC's strong financial performance has been rewarded with a 76% return in the stock year-to-date and 21% since the end of August. The current rich valuation has pushed market full cycle economics to near-breakeven levels and potentially limits future appreciation. Operating results remain strong in Cana-Woodford, while new drilling in the Permian Delaware Basin, both conventional and unconventional, should support continued near-term annual production growth approaching 10%. However, with nearly half of its production from operations in the Permian and Gulf Coast, which contain less than a third of proven reserves, the company potentially faces challenges to sustaining growth longer term at levels consistent with its valuation.
Concho Resources Inc. (CXO)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book <u>reserve locations:</u> Texas (Permian)	91/63% 447/61% 61% 106%/123% 100%	With its extraordinary record of production growth, averaging 36% per year over the past 3 years, CXO has achieved the richest valuation in the group at $35 per boe and has provided tangible evidence of the potential scale of opportunity in the Permian Basin. A rich valuation, market full cycle economics near breakeven, and returns of 43% year-to-date, 19% since August, probably limit future outperformance. Exclusive focus on the Permian region enhances operational expertise and extensive Permian acreage provides a platform for future growth in both reserves and production. Current activities in the Delaware Basin (Bone Spring, Wolfcamp), where CXO is building infrastructure in the underdeveloped southern section and expanding its horizontal drilling program in the north, should support production growth near 15% in the intermediate term.
ConocoPhillips (COP)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book <u>reserve locations:</u> Canada Alaska Asia Pacific/Australia/NZ Texas / Gulf Coast Europe	1,509/56% 8,642/62% 65% 127%/87% 26% 20% 16% 11% 10%	COP has the second lowest valuation in the group at $12 per boe and has struggled over the last several years to produce and replace reserves at a cost below its average wellhead price. As the operator of a diverse global portfolio of oil-rich assets and the largest independent E&P company with the largest exploration budget, COP has the least operational and valuation risk in the group. A dividend yield approaching 4% limits downside price risk in the stock, while an outlook for modest production growth and a recovery in margins create a platform for higher returns in the future. Cash from operations currently funds both the dividend and significant capital spending program without external financing. COP has set targets for margin expansion of 3-5% on production growth of 3% in 2013, which will come primarily from US operations and in particular from the Bakken and Eagle Ford. New discoveries in deepwater Gulf of Mexico (Shenandoah, Coronado) provide additional sources of growth for the future.

Company Notes

company	reserves/production		investment thesis/risks
Continental Resources Inc. (CLR)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book reserve locations: Rockies Mid-Continent	138/71% 785/72% 41% 133%/161% 83% 17%	Perhaps one of the best overall operators in the group, CLR holds significant tracts of key acreage in the Bakken and underlying Three Forks, where drilling results and production have consistently exceeded industry projections. The company has the highest book full cycle economics, the second best cash margins per barrel, and the second highest valuation at $32 per boe in the group, but still appears reasonably valued with market full cycle economics of 133%. Production growth in 2013 is expected to approach the 5-year average of 40%, while margins continue to improve as the company realizes operational efficiencies. Results from Mid-Continent SCOOP (South Central Oklahoma Oil Province) appear promising and should gain momentum as CLR develops operational proficiency in the region. Insiders own over 70% of the company's stock led by CEO Harold Hamm, who personally owns 68%.
Denbury Resources Inc. (DNR)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book reserve locations: Texas / Gulf Coast Rockies	74/94% 451/82% 55% 128%/139% 63% 37%	DNR has developed operational expertise in CO_2 enhanced oil recovery (EOR) with a singular focus on reliable production from mature, oil-rich fields with relatively little geological and operational risk. By targeting oil properties no longer economically viable for primary recovery methods, the company has been able to replace reserves cheaply, but maintain solid operating margins. Gulf Coast properties have delivered reliable production at premium prices and have generated the cash to develop infrastructure and pursue other opportunities for tertiary recovery. In 2013 oil production is expected to expand on flat growth in total production as DNR completes the transition to an EOR pure play. The company continues to apply excess cash to the stock buyback program initiated to counteract dilution from the Encore merger in 2010. Since October 2011, DNR has spent over $500 million on share repurchases and anticipates spending another $229 million under this program.
Devon Energy Corporation (DVN)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book reserve locations: Texas / Gulf Coast Canada Mid-Continent Rockies	698/42% 2,963/47% 72% 116%/67% 52% 25% 17% 6%	DVN has the lowest valuation in the group at $10 per boe and appears trapped in high cost regions with weak price realizations: Texas gas and Canadian oil, which account for a sizable portion of the company's reserves, but lack the economic potential of a Bakken, Eagle Ford, or Marcellus play. Financial performance has been weak, with book full cycle numbers mired below 100% since 2009 except for 2 quarters in 2011. DVN continues to pursue growth in oil production, now over 40%, to offset the impact of a decline in overall production, but the capital required has been significant and full cycle costs continue to exceed realized prices. DVN has been able to tap significant sources of capital to fund the investment, including expected proceeds of $400 million from the spinoff of its midstream operations and $6.5 billion in offshore accounts, at least $2 billion of which the company plans to repatriate in 2013.
EOG Resources, Inc. (EOG)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book reserve locations: Texas / Gulf Coast Rockies Trinidad Appalachian	506/55% 1,811/56% 53% 117%/86% 46% 43% 6% 3%	EOG has historically been among the first in the sector to implement new ideas and identify emerging trends: the company was one of the first to transport oil from the Rockies by rail to realize pricing at a substantial premium to WTI and was among the first to mine its own sand to reduce the cost of fracking proppant. As an early mover into new areas and unconventional plays, EOG now holds premium acreage in key regions at a substantially lower cost per acre than its competition with initial production rates on its wells consistently among the highest. Financial performance as measured by book full cycle economics appears depressed at 86% after massive negative reserve revisions in 2012. Market full cycle, based on the third highest valuation in the group at $29 per boe, is probably a more representative measure at 117%. The company has improved cash margins sequentially over the past four years and in each quarter of 2013. Production growth for the year is expected to reach 7.5%, led by year-over-year growth in oil production of 35% from the Bakken and Eagle Ford shale. Together, the Bakken and Eagle Ford represent 80% of EOG's current horizontal production and provide a platform for future growth from downspacing with new wells and improvements in fracking technique.

Company Notes

company	reserves/production		investment thesis/risks
Linn Energy, LLC (LINE)	production (mboepd) / %oil	130/45%	Production, annual dividend, and total debt continue to grow an impressive pace, but LINE carries a rich valuation for its financial metrics, which put both book and market full cycle economics under 75%. LINE has been the beneficiary of an equity market that has been willing to overpay for yield and competitors that have been divesting mature assets to fund development of emerging trends. A growth model based on frequent acquisitions of mature properties may work at cheap valuations for operators with expertise in secondary and tertiary recovery, but becomes risky when development capital is limited by high leverage and large dividends. LINE's pending merger with Berry Petroleum, if completed, will buy the company more time and negotiations appear to have resumed now that the SEC has concluded the inquiry announced in July into the company's accounting policies.
	reserves (mmboe) / %oil	799/46%	
	developed	65%	
	full cycle at market/book	74%/72%	
	reserve locations:		
	Mid-Continent	55%	
	Rockies	25%	
	Texas / Gulf Coast	10%	
	Appalachian	6%	
Marathon Oil Corporation (MRO)	production (mboepd) / %oil	506/73%	MRO's international operations are oil rich and have shown solid growth, but its domestic operations appear to offer more attractive prospects. Although 70% of its production is oil, the fourth highest percentage in the peer group, the company suffers from a significant burden of international taxes, which leave it with cash margins near the bottom. MRO recently announced agreements to sell its interests in Angola Blocks 31 and 32 for $2.1 billion and plans use a $500 million of the proceeds to buy back stock. Domestic operations in Eagle Ford, Bakken, and the Oklahoma resource bin (Mississippi Lime, Granite Wash) will be the leading contributors to the company's 7% year-over-year production growth in 2013. The company has allocated 75% of its capital budget to North America, which should support continued growth from these areas. Deepwater prospects offer further growth potential, led by developing opportunities in the Gulf of Mexico.
	reserves (mmboe) / %oil	2,017/77%	
	developed	72%	
	full cycle at market/book	103%/73%	
	reserve locations:		
	Canada	32%	
	Africa / Middle East	30%	
	Texas / Gulf Coast	22%	
	Rockies	10%	
Newfield Exploration Co. (NFX)	production (mboepd) / %oil	106/49%	At a valuation of $12.57 per boe, NFX appears cheap in comparison with peers, but the company's new "laser focus" (per the CEO) on domestic oil production has yet to yield significant results. Production growth must ultimately come from four key areas: Uinta, Cana-Woodford, Williston and Eagle Ford. The company is actively seeking to divest its remaining international assets with little reported progress to date. Transportation costs and capacity constraints have limited production from the Uinta Basin, where initial experiments with rail transport have met with only limited success. NFX has made progress in reducing costs in its domestic operations, but margins are among the lowest in its peer group and considerable uncertainty remains on the timing of a turnaround.
	reserves (mmboe) / %oil	566/48%	
	developed	53%	
	full cycle at market/book	117%/58%	
	reserve locations:		
	Mid-Continent	43%	
	Rockies	41%	
	Texas	10%	
	Asia Pacific	6%	
Noble Energy, Inc. (NBL)	production (mboepd) / %oil	254/43%	NBL continues to post positive results from operations in the DJ Basin (Niobrara), Gulf of Mexico, and Marcellus in addition to impressive first production from its Tamar operations (offshore Israel). New wells in Equatorial Guinea and Nicaragua are expected to come on line in the third quarter and contribute to overall production growth of 12% in 2013. The company is pursuing several international projects including plans to develop a significant deepwater prospect (Leviathan) in the Eastern Mediterranean. Operations in the DJ Basin, which accounts for 35% of the company's production, have experienced disruptions from recent floods in the region, and while it appears that infrastructure has suffered no major damage, the flooding is likely to have a negative impact on production volume and drilling schedules for the third quarter. NBL benefits from reserves balanced between domestic and international operations, solid cash production margins, and significant prospects for growth from operations in the Mediterranean despite the geopolitical risk from operations in to Middle East.
	reserves (mmboe) / %oil	1,184/30%	
	developed	39%	
	full cycle at market/book	113%/117%	
	reserve locations:		
	Africa / Middle East	51%	
	Rockies	33%	
	Appalachian	12%	
	Gulf of Mexico:	2%	

Company Notes

company	reserves/production		investment thesis/risks
Pioneer Natural Resources Co. (PXD)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book reserve locations: Texas / Gulf Coast Rockies Mid-Continent	176/62% 1,086/66% 58% 98%/83% 70% 16% 12%	PXD stock is up almost 90% since the beginning of the year on 15% growth in production and investors' faith in future prospects from operations in the Permian and Eagle Ford, which was validated by the sale in May of a 40% stake in the company's Wolfcamp shale prospect to Sinochem for $500 million in cash plus a commitment to invest $1.2 billion in exploration and development. Production growth has been driven largely by drilling in the Permian and Eagle Ford, but production and reserve replacement costs remain high for the current valuation. Operations in what is potentially massive resource, the Permian Spraberry trend, together with results of appraisal drilling in Alaska show great potential. Proceeds from the sale of the Wolfcamp interest to Sinochem give PXD the means to develop these prospects aggressively and may lend some justification to the current valuation of the stock. Production growth is expected to remain near the current level of 15% for 2013.
QEP Resources, Inc. (QEP)	production (mboepd) / %oil Reserves (mmboe) / %oil developed full cycle at market/book reserve locations: Rockies Mid-Continent Texas / Gulf Coast	143/27% 656/33% 54% 112%/79% 73% 13% 13%	QEP production has remained more or less flat year-to-date, as the company realigns development activities to increase the oil share of total production. In the first quarter, oil accounted for 25% of production, but 55% of total revenue. The company's cash production and reserve replacements costs are competitive with peers, but its average wellhead price is among the lowest in the group. Current drilling activities are concentrated primarily in the oily plays of the Williston Basin (Bakken, Three Forks), Pinedale Anticline, and Uinta Basin. For 2013 QEP has set a target of 30% of total production for oil, which, if achieved, should increase margins and help fund a recovery in production growth in 2014.
Range Resources Corporation (RRC)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book reserve locations: Appalachian Texas / Gulf Coast Mid-Continent	152/22% 1,107/26% 50% 103%/134% 88% 6% 6%	RRC has the acreage, expertise, and infrastructure to support annual production growth of 20-25% for several years. With 430 horizontal wells in the Marcellus at end of first quarter, the company controls acreage that could potentially accommodate up to an additional 6,000 wells at current spacing. The company has achieved some of the best operating results versus its peer group with book full cycle economics of 134%, and it current valuation reflects that. For 2013, production is expected to grow 25%, leading to lower unit production costs and a substantial increase in cash flow, which should enable the company to pursue new opportunities in the Mid-Continent and other emerging plays.
Whiting Petroleum (WLL)	production (mboepd) / %oil reserves (mmboe) / %oil developed full cycle at market/book reserve locations: Rocky Mt Texas / Gulf Coast Mid-Continent	93/87% 344/90% 60% 138%/117% 51% 33% 13%	WLL continues to deliver oil-rich production growth from proven operations, particularly in the Bakken and underlying Three Forks formations in the Williston Basin. Growth in production is accelerating. The high oil content of the production stream gives the company one of the highest realized prices in the peer group and the cash margin to help fund development of its productive, oil-rich operations in the Bakken and exploration and development of emerging operations in the Permian and Colorado Niobrara. The company will take on additional debt to fund development for annual production growth of 12%. Current valuation of $29 per boe appears cheap for current and prospective performance with market full cycle at 138%.

Appendix

Table 1. U.S. Macroeconomic Data

Category	Description	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	trend sep 12
Employment	Initial Jobless Claims (4 wk avg K)	374	369	403	365	360	356	355	343	353	346	342	330	305	
	Non-farm Payrolls - Total (K)	134.4	135.2	135.6	135.6	134.8	135.2	135.3	135.5	135.7	135.9	136.0	136.1		
	Non-farm Payrolls - Private (K)	112.1	112.3	112.6	112.8	113.0	113.3	113.5	113.6	113.8	114.0	114.2	114.3		
	Unemployment %	8.1%	7.9%	7.8%	7.8%	7.9%	7.7%	7.6%	7.5%	7.6%	7.6%	7.4%	7.3%		
	U-6 Unemployment %	14.7%	14.5%	14.4%	14.4%	14.4%	14.3%	13.8%	13.9%	13.8%	14.3%	14.0%	13.7%		
	NFIB Small Business Hiring Plans	4.0	4.0	5.0	1.0	3.0	4.0	0.0	6.0	5.0	7.0	9.0	10.0	9.0	
Housing	Existing Home Sales (Ann. Rate mm)	4.84	4.83	4.96	4.90	4.94	4.95	4.94	4.97	5.14	5.06	5.39	5.48		
	New Home Sales (Ann. Rate k)	384	365	398	396	458	445	443	446	429	454	390	421		
	New Home Starts(Ann. Rate K)	854	864	842	983	898	969	1,005	852	919	835	883	891		
	Case-Shiller Composite 20	146.2	146.0	145.8	146.1	146.2	146.6	148.6	152.4	156.2	159.5	162.5			
Manufacturing	Durable Goods Orders ($, Bn)	198	219	218	229	215	229	215	223	235	244	225	225		
	Durable Goods Orders (MoM)	-	10.6%	(0.4%)	5.1%	(6.1%)	6.4%	(5.9%)	3.6%	5.5%	3.9%	(8.1%)	0.1%		
	ISM Manufacturing Index (PMI)	50.7	51.7	49.9	50.2	53.1	54.2	51.3	50.7	49.0	50.9	55.4	55.7	56.2	
	Philly Fed Survey	1.4	4.2	(8.9)	4.6	(5.8)	(12.5)	2.0	1.3	(5.2)	12.5	19.8	9.3	22.3	
	Empire Fed Survey	(7.5)	(6.8)	(4.3)	(7.3)	(7.8)	10.0	9.2	3.1	(1.4)	7.8	9.5	8.2		
	Dallas Fed Survey	(4.3)	(1.8)	(6.7)	2.5	5.5	2.2	7.4	(15.6)	(10.5)	6.5	4.4	5.0		
	Richmond Fed Survey	5.0	(3.0)	6.0	1.0	(10.0)	(1.0)	-	(5.0)	(1.0)	7.0	(11.0)	14.0	-	
Non-Manufacturing	ISM Services	54.3	54.8	54.8	55.7	55.2	56.0	54.4	53.1	53.7	52.8	56.0	58.6	54.4	
	PCE ($ Bn)	10,567	10,559	10,593	10,602	10,614	10,644	10,674	10,679	10,689	10,708	10,715	10,732		
	PCE (YoY)	2.3%	1.8%	2.1%	2.2%	2.0%	1.7%	2.0%	1.7%	1.8%	2.0%	1.7%	2.0%		
	Retail Sales x Food Services ($ Bn)	364	367	368	369	370	374	373	373	375	378	380	381		
	Retail Sales x Food Services (YoY)	4.5%	4.3%	4.2%	4.4%	4.4%	4.3%	3.8%	3.5%	4.3%	5.2%	5.9%	4.7%		
	U. Mich Consumer Confidence	78.3	82.6	82.7	72.9	73.8	77.6	78.6	76.4	84.5	84.1	85.1	82.1	76.8	
Monetary	Loans & Leases Outstanding ($ Bn)	7,152	7,194	7,187	7,270	7,260	7,271	7,282	7,317	7,294	7,320	7,333	7,319	7,318	
	Loans & Leases Outstanding (MoM)	0.11%	0.58%	(0.10%)	1.15%	(0.13%)	0.16%	0.15%	0.48%	(0.31%)	0.35%	0.18%	(0.19%)	(0.02%)	
	Adjusted Monetary Base ($ Bn)	2,589	2,642	2,651	2,633	2,796	2,879	2,986	3,034	3,173	3,192	3,326	3,466	3,528	
	Adjusted Monetary Base (MoM)	(2.35%)	2.03%	0.33%	(0.66%)	6.19%	2.97%	3.71%	1.62%	4.57%	0.60%	4.22%	4.19%	1.81%	
	US 10-year spread to fed funds	154	160	153	167	190	179	176	158	204	240	252	272	255	
	US 5-year spread to fed funds	54	63	53	63	79	67	68	59	93	131	130	157	132	
	AAA Corporates spread to fed funds	333	331	349	358	381	375	381	361	400	423	431	442	450	
Transportation	Baltic Dry Index	766	1,026	1,086	699	760	757	910	863	809	1,171	1,062	1,132	2,003	
	Rail Intermodal Loadings (000)	1,013	994	1,005	1,011	1,070	1,070	1,066	1,061	1,059	1,009	964	1,286	1,028	
National	GDP (QoQ)	2.8	0.1	0.1	0.1	1.1	1.1	1.1	2.5	2.5	2.5				
	Chicago Fed National Activity Index	0.03	(0.47)	0.82	0.17	(0.57)	0.56	(0.39)	(0.41)	(0.05)	(0.24)	(0.43)	0.14		
Commodities	CPI (%YoY)	1.99%	2.00%	1.94%	1.89%	1.92%	2.00%	1.89%	1.72%	1.68%	1.64%	1.70%	1.77%		
	PPI (%YoY)	2.10%	2.30%	1.50%	1.40%	1.50%	1.80%	1.10%	0.50%	1.70%	2.50%	2.10%	1.40%		
	Copper ($/lb)	377	353	365	365	375	355	344	320	331	306	306	323	332	
	Gold ($/oz)	1,776	1,721	1,713	1,676	1,662	1,578	1,597	1,474	1,393	1,224	1,325	1,396	1,327	
	Oil ($/bl)	93.76	87.83	90.13	92.27	98.94	93.23	97.57	93.67	92.21	96.56	102.50	107.65	102.33	
	Natural Gas ($/mcfe)	3.78	3.90	3.71	3.59	3.60	3.66	4.13	4.42	4.00	3.57	3.45	3.58	3.56	
	Wheat ($/bsh)	912	879	879	807	802	725	699	740	716	658	668	654	679	
FX	USD/EUR	1.29	1.30	1.30	1.32	1.36	1.31	1.28	1.32	1.30	1.30	1.33	1.32	1.35	
	JPY/USD	78.0	79.8	82.5	86.8	91.7	92.6	94.2	97.5	100.5	99.3	98.0	98.2	98.3	
	BPS/USD	1.62	1.61	1.60	1.63	1.59	1.52	1.52	1.55	1.52	1.52	1.52	1.55	1.62	
	CNY/USD	6.28	6.24	6.23	6.23	6.22	6.22	6.21	6.17	6.13	6.14	6.13	6.12	6.12	

Sources: Scura Paley,Bloomberg, Government agencies

Table 2. Index Summary Returns

		Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	ytd return	12 mo return	% market
investment grade	issuers	973	984	980	987	990	990	1,019	1,029	1,028	1,025	1,036	1,039			
	market (bln)	4,548	4,576	4,552	4,553	4,586	4,570	4,714	4,648	4,488	4,507	4,491	4,584			
	duration	6.83	6.78	6.76	6.69	6.70	6.62	6.78	6.66	6.48	6.47	6.42	6.44			
	yield	2.74%	2.75%	2.75%	2.85%	2.78%	2.79%	2.65%	3.32%	3.42%	3.32%	3.46%	3.36%			
	spread	151	160	154	148	149	150	147	147	167	153	155	156			
	total return	1.32%	-0.07%	-0.01%	-0.72%	0.71%	0.04%	1.72%	-2.32%	-2.78%	0.75%	-0.67%	0.87%	-2.46%	-1.25%	100.0%
high yield	issuers	1,025	1,029	1,025	1,031	1,043	1,040	1,037	1,060	1,056	1,056	1,068	1,073			
	market (bln)	1,130	1,140	1,165	1,184	1,196	1,203	1,213	1,225	1,185	1,220	1,226	1,255			
	duration	3.83	3.83	3.76	3.69	3.69	3.58	3.56	3.73	4.07	3.85	3.93	3.89			
	yield	6.54%	6.47%	6.11%	5.87%	5.84%	5.64%	5.29%	5.70%	6.64%	6.10%	6.36%	6.25%			
	spread	565	566	534	496	499	481	458	463	522	472	479	484			
	total return	0.85%	0.78%	1.59%	1.35%	0.47%	0.99%	1.90%	-0.52%	-2.64%	1.88%	-0.61%	0.99%	3.78%	7.15%	100.0%
s&p 500	market (bln)	13,049	13,062	13,165	13,829	13,940	14,438	14,699	15,012	14,892	15,495	14,967	15,440			
	p/e	14.0x	14.1x	14.1x	14.7x	14.9x	15.4x	15.6x	15.9x	15.5x	16.1x	15.6x	16.1x			
	yield	2.13%	2.19%	2.24%	2.15%	2.17%	2.10%	2.08%	2.08%	2.14%	2.05%	2.15%	2.09%			
	total return	-1.84%	0.57%	0.91%	5.18%	1.36%	3.75%	1.92%	2.34%	-1.34%	5.09%	-2.92%	3.17%	19.79%	19.33%	100.0%
Treasuries	US TSY 5 yr	0.72%	0.62%	0.72%	0.88%	0.76%	0.77%	0.68%	1.02%	1.40%	1.38%	1.64%	1.38%	66	66	
	US TSY 10 yr	1.69%	1.62%	1.76%	1.99%	1.88%	1.85%	1.67%	2.13%	2.49%	2.58%	2.79%	2.61%	85	92	

Sources: Scura Paley, Bloomberg

Table 3. Index Sector Returns

		Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	ytd return	12 mo return	% market
Consumer Discretionary	investment grade	1.3%	-0.5%	-0.2%	-1.1%	0.7%	0.0%	2.1%	-2.6%	-2.9%	0.5%	-0.8%	0.5%	-3.7%	-3.0%	11.4%
	high yield	0.7%	0.4%	1.4%	1.4%	0.4%	1.2%	1.7%	-0.2%	-2.2%	1.6%	-0.7%	1.0%	4.1%	6.8%	20.9%
	s&p 500	-1.4%	2.5%	-0.1%	5.2%	0.7%	4.2%	3.9%	2.1%	0.7%	5.2%	-3.2%	4.8%	26.0%	27.2%	14.2%
Consumer Staples	investment grade	1.3%	-0.5%	-0.3%	-0.9%	0.6%	0.1%	1.7%	-2.7%	-2.5%	0.7%	-0.7%	0.8%	-3.0%	-2.5%	5.9%
	high yield	1.1%	0.3%	1.9%	2.2%	0.6%	1.4%	2.0%	-0.0%	-2.3%	1.3%	-0.6%	1.0%	5.8%	9.3%	3.6%
	s&p 500	-1.6%	1.8%	-2.4%	6.3%	3.6%	4.6%	3.3%	-2.4%	-0.2%	3.9%	-4.3%	1.3%	16.7%	14.0%	9.0%
Energy	investment grade	1.8%	-0.5%	0.1%	-1.4%	0.6%	0.0%	2.0%	-3.0%	-3.2%	0.9%	-1.1%	1.1%	-4.0%	-2.7%	14.9%
	high yield	0.9%	0.6%	1.7%	0.9%	0.5%	0.7%	1.9%	-0.9%	-3.3%	2.2%	-0.6%	1.0%	2.3%	5.7%	14.7%
	s&p 500	-2.2%	-1.7%	0.4%	7.8%	0.4%	2.2%	-0.7%	2.5%	-1.8%	5.1%	-1.7%	1.7%	16.2%	12.1%	10.4%
Financials	investment grade	1.2%	0.5%	0.3%	-0.0%	0.8%	0.1%	1.4%	-1.6%	-2.5%	1.0%	-0.4%	1.0%	-0.2%	1.8%	24.8%
	high yield	1.5%	0.9%	1.5%	1.6%	0.9%	1.0%	1.9%	-0.3%	-2.9%	2.1%	-0.4%	1.2%	5.1%	9.2%	13.8%
	s&p 500	1.8%	-1.1%	4.6%	6.2%	1.1%	3.6%	3.1%	6.9%	-1.5%	5.8%	-5.1%	2.7%	24.8%	31.4%	15.2%
Healthcare	investment grade	1.2%	-0.0%	-0.4%	-1.1%	0.8%	0.1%	1.7%	-2.7%	-2.5%	0.6%	-0.6%	0.7%	-3.1%	-2.4%	7.6%
	high yield	0.4%	1.1%	1.0%	1.1%	0.9%	0.7%	2.3%	-1.0%	-2.6%	1.9%	-0.5%	0.9%	3.6%	6.2%	7.6%
	s&p 500	-0.4%	0.3%	-0.4%	7.6%	1.4%	5.5%	2.9%	1.3%	-0.8%	6.9%	-3.5%	3.1%	26.5%	25.8%	13.1%
Industrials	investment grade	1.1%	0.1%	-0.3%	-0.9%	0.9%	0.1%	1.6%	-2.5%	-2.5%	0.5%	-0.6%	0.9%	-2.6%	-1.7%	9.0%
	high yield	0.7%	0.8%	1.2%	1.7%	0.7%	1.0%	1.2%	-0.3%	-2.1%	2.0%	-0.3%	1.0%	4.9%	7.7%	7.9%
	s&p 500	-0.9%	1.5%	2.2%	5.5%	2.5%	2.6%	0.6%	4.9%	-1.5%	5.9%	-2.6%	6.2%	26.2%	29.7%	11.4%
Materials	investment grade	1.6%	0.1%	0.1%	-0.7%	0.6%	-0.4%	1.5%	-2.8%	-4.2%	0.6%	-0.7%	1.4%	-4.8%	-3.1%	6.2%
	high yield	1.3%	1.2%	1.8%	1.6%	0.7%	0.9%	1.8%	-0.8%	-2.9%	1.8%	-0.6%	1.3%	3.9%	8.4%	11.0%
	s&p 500	-1.5%	0.9%	3.0%	4.0%	-1.6%	2.8%	1.6%	1.8%	-4.5%	5.6%	-0.1%	4.5%	14.5%	17.1%	3.7%
Technology	investment grade	1.0%	-0.8%	0.2%	-1.1%	0.2%	-0.1%	1.9%	-2.1%	-2.5%	0.6%	-0.9%	0.7%	-3.3%	-2.9%	10.7%
	high yield	1.4%	0.7%	1.9%	1.2%	0.0%	1.1%	2.2%	-0.7%	-2.5%	2.1%	-0.9%	1.0%	3.5%	7.7%	16.3%
	s&p 500	-6.6%	0.5%	-0.3%	1.8%	0.8%	2.3%	2.4%	2.7%	-2.9%	3.5%	-1.0%	2.5%	12.6%	5.3%	20.2%
Utilities	investment grade	1.4%	-0.3%	-0.6%	-0.8%	1.1%	0.1%	2.1%	-3.0%	-3.2%	0.7%	-0.7%	0.5%	-3.3%	-2.9%	9.5%
	high yield	-1.5%	1.3%	2.5%	1.2%	-0.7%	0.7%	2.3%	0.1%	-3.4%	1.3%	-1.0%	-0.1%	0.3%	2.6%	4.1%
	s&p 500	2.3%	-7.9%	-0.3%	4.7%	2.4%	5.1%	6.4%	-9.0%	1.1%	3.8%	-5.0%	1.0%	10.0%	3.4%	3.0%

Sources: Scura Paley, Bloomberg

Table 4. Index Industry Group Returns

		Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	ytd	12 mo	% market
Consumer Discretionary	investment grade	0.5%	0.3%	0.1%	-0.1%	0.6%	0.1%	1.1%	-1.4%	-1.6%	0.8%	-0.3%	0.9%	0.0%	0.9%	1.0%
Capital Goods	high yield	0.6%	0.9%	1.1%	1.5%	0.2%	1.1%	1.5%	-0.1%	-2.4%	1.7%	-0.9%	1.0%	3.5%	6.2%	3.5%
	s&p 500	5.8%	2.2%	10.0%	3.7%	-1.3%	5.7%	4.9%	7.8%	-1.9%	7.3%	-2.3%	5.4%	32.4%	57.5%	1.4%
Consumer Discretionary	investment grade	1.6%	-0.8%	-0.1%	-1.2%	0.4%	-0.0%	2.3%	-2.8%	-3.1%	0.6%	-1.2%	0.6%	-4.3%	-3.6%	1.6%
Entertainment	high yield	0.2%	1.2%	1.5%	1.7%	0.5%	1.2%	1.0%	-0.1%	-2.0%	0.9%	0.5%	0.6%	4.2%	7.3%	3.6%
	s&p 500	-4.1%	2.7%	1.5%	8.1%	1.0%	4.0%	5.8%	-0.0%	-0.5%	4.9%	-2.1%	5.3%	29.3%	29.4%	1.9%
Consumer Discretionary	investment grade	1.8%	-1.0%	0.0%	-1.4%	0.8%	0.1%	2.7%	-2.8%	-3.9%	0.1%	-0.8%	0.3%	-4.9%	-4.1%	3.6%
Media	high yield	1.0%	-0.2%	1.6%	1.1%	0.2%	0.9%	1.9%	-0.4%	-2.0%	1.7%	-1.2%	1.3%	3.6%	6.2%	8.3%
	s&p 500	0.5%	-0.4%	2.0%	2.7%	0.5%	7.3%	0.4%	2.3%	3.8%	5.2%	-3.5%	6.3%	27.4%	30.1%	2.1%
Consumer Discretionary	investment grade	1.1%	-0.2%	-0.5%	-1.3%	0.7%	-0.0%	1.9%	-2.9%	-2.6%	0.6%	-0.7%	0.5%	-3.8%	-3.3%	5.1%
Retail	high yield	0.7%	0.4%	1.2%	1.3%	0.6%	1.4%	2.3%	-0.2%	-2.3%	2.0%	-0.8%	0.8%	5.1%	7.6%	5.6%
	s&p 500	-1.9%	3.3%	-2.1%	5.2%	0.9%	3.6%	4.0%	1.9%	0.7%	4.9%	-3.5%	4.3%	24.0%	23.1%	8.8%
Consumer Staples	investment grade	1.3%	-0.5%	-0.3%	-0.9%	0.6%	0.1%	1.7%	-2.6%	-2.5%	0.7%	-0.7%	0.8%	-3.0%	-2.5%	6.0%
Food	high yield	1.1%	0.3%	1.9%	2.2%	0.6%	1.4%	2.0%	-0.0%	-2.3%	1.3%	-0.6%	1.0%	5.8%	9.3%	3.6%
	s&p 500	-1.6%	1.8%	-2.4%	6.3%	3.6%	4.6%	3.3%	-2.4%	-0.2%	3.9%	-4.3%	1.3%	16.7%	14.0%	9.0%
Energy	investment grade	1.8%	-0.5%	0.1%	-1.4%	0.6%	0.0%	2.0%	-3.0%	-3.2%	0.9%	-1.1%	1.1%	-4.0%	-2.7%	14.9%
Energy	high yield	0.9%	0.6%	1.7%	0.9%	0.5%	0.7%	1.9%	-0.9%	-3.3%	2.2%	-0.6%	1.0%	2.3%	5.7%	14.7%
	s&p 500	-2.2%	-1.7%	0.4%	7.8%	0.4%	2.2%	-0.7%	2.5%	-1.8%	5.1%	-1.7%	1.7%	16.2%	12.1%	10.4%
Financials	investment grade	1.2%	0.5%	0.3%	-0.0%	0.7%	0.0%	1.2%	-1.4%	-2.3%	0.9%	-0.4%	1.0%	-0.3%	1.6%	12.9%
Banking	high yield	2.2%	1.4%	2.2%	2.1%	1.0%	1.1%	2.2%	0.8%	-4.1%	2.2%	0.5%	2.3%	8.3%	14.9%	3.2%
	s&p 500	1.4%	-1.8%	7.5%	4.2%	1.1%	3.0%	2.6%	9.3%	-1.9%	7.3%	-5.8%	0.4%	21.1%	29.6%	6.0%
Financials	investment grade	1.4%	0.8%	0.5%	0.3%	1.1%	0.1%	1.5%	-1.7%	-2.7%	1.4%	-0.3%	1.2%	0.6%	3.4%	3.8%
Brokerage	high yield	0.6%	0.1%	1.5%	2.1%	0.7%	1.4%	2.4%	-0.5%	-3.7%	2.6%	-0.5%	1.1%	5.5%	7.8%	1.2%
	s&p 500	4.4%	-0.9%	5.4%	12.8%	1.0%	3.5%	1.9%	9.4%	-4.9%	8.2%	-5.8%	3.7%	32.1%	44.2%	2.4%
Financials	investment grade	1.1%	0.2%	0.2%	0.0%	0.6%	0.3%	1.2%	-1.6%	-2.4%	0.9%	-0.6%	1.1%	-0.4%	1.0%	2.6%
Finance Companies	high yield	1.0%	1.2%	1.0%	0.7%	0.5%	0.7%	1.7%	-1.1%	-1.8%	1.7%	-0.8%	0.6%	2.2%	5.5%	6.7%
	s&p 500	0.7%	-0.9%	2.5%	3.3%	0.6%	4.2%	5.2%	1.8%	0.0%	2.4%	-5.1%	4.5%	17.6%	20.3%	3.0%
Financials	investment grade	1.5%	0.3%	0.3%	-0.1%	1.1%	0.4%	1.9%	-1.9%	-3.0%	1.1%	-0.6%	0.6%	-0.6%	1.5%	5.6%
Insurance	high yield	1.7%	-0.2%	1.6%	3.1%	1.3%	1.6%	2.0%	0.2%	-4.1%	2.5%	-0.5%	1.4%	7.5%	10.9%	2.9%
	s&p 500	1.8%	-0.2%	1.4%	7.9%	1.8%	4.4%	3.2%	5.4%	0.1%	4.7%	-3.3%	4.7%	32.4%	36.4%	3.8%
Healthcare	investment grade	1.2%	-0.0%	-0.4%	-1.1%	0.8%	0.1%	1.7%	-2.7%	-2.5%	0.6%	-0.6%	0.7%	-3.1%	-2.4%	7.6%
Healthcare	high yield	0.4%	1.1%	1.0%	1.1%	0.9%	0.7%	2.3%	-1.0%	-2.6%	1.9%	-0.5%	0.9%	3.6%	6.2%	7.6%
	s&p 500	-0.4%	0.3%	-0.4%	7.6%	1.4%	5.5%	2.9%	1.3%	-0.8%	6.9%	-3.5%	3.1%	26.5%	25.8%	13.1%
Industrials	investment grade	1.3%	-0.0%	-0.2%	-0.2%	0.7%	0.2%	1.5%	-2.3%	-3.1%	0.6%	-1.0%	1.3%	-2.4%	-1.4%	0.7%
Industrial Services	high yield	1.0%	1.1%	1.2%	2.0%	0.5%	1.3%	1.8%	-0.7%	-2.0%	2.2%	-0.7%	0.9%	5.3%	9.0%	2.4%
	s&p 500	2.3%	-1.3%	4.3%	7.5%	1.2%	5.5%	1.8%	3.8%	-4.4%	4.9%	-4.4%	5.8%	23.0%	29.5%	0.9%
Industrials	investment grade	1.1%	0.0%	-0.3%	-1.0%	0.9%	0.1%	1.5%	-2.4%	-2.3%	0.5%	-0.5%	0.9%	-2.4%	-1.6%	6.3%
Manufacturing	high yield	0.8%	0.7%	1.2%	1.2%	0.5%	0.8%	1.5%	-0.3%	-2.3%	2.0%	-0.2%	1.0%	4.3%	7.1%	4.6%
	s&p 500	-1.9%	2.2%	2.0%	4.8%	2.5%	2.2%	0.1%	5.6%	-1.1%	6.4%	-2.6%	5.8%	25.9%	28.6%	8.4%
Industrials	investment grade	1.1%	0.2%	-0.2%	-0.9%	1.0%	0.1%	2.1%	-2.9%	-2.9%	0.4%	-0.9%	1.1%	-3.1%	-2.1%	2.0%
Transportation	high yield	-0.3%	0.9%	1.0%	2.6%	2.4%	1.0%	-2.8%	1.1%	-1.6%	1.7%	0.3%	1.1%	6.0%	7.7%	0.6%
	s&p 500	2.5%	-0.5%	2.1%	8.0%	3.4%	2.8%	2.1%	2.5%	-1.9%	4.2%	-1.7%	7.6%	29.9%	35.4%	2.1%
Materials	investment grade	1.6%	0.1%	0.1%	-0.7%	0.6%	-0.4%	1.5%	-2.8%	-4.2%	0.6%	-0.7%	1.4%	-4.8%	-3.1%	6.2%
Materials	high yield	1.3%	1.2%	1.8%	1.6%	0.7%	0.9%	1.8%	-0.8%	-2.9%	1.8%	-0.6%	1.3%	3.9%	8.4%	11.0%
	s&p 500	-1.5%	0.9%	3.0%	4.0%	-1.6%	2.8%	1.6%	1.8%	-4.5%	5.6%	-0.1%	4.5%	14.5%	17.1%	3.7%
Technology	investment grade	0.2%	-0.8%	0.2%	-0.8%	0.7%	0.3%	1.2%	-1.9%	-2.1%	0.6%	-0.7%	0.6%	-2.1%	-2.5%	4.0%
Technology	high yield	-0.3%	1.0%	2.0%	2.1%	0.7%	1.4%	1.8%	-0.2%	-2.2%	2.3%	-0.4%	1.6%	7.3%	10.3%	5.7%
	s&p 500	-6.8%	0.7%	-0.2%	1.6%	0.6%	2.3%	1.9%	4.5%	-3.6%	4.0%	-0.5%	2.8%	14.1%	6.8%	17.7%
Technology	investment grade	1.5%	-0.8%	0.2%	-1.3%	-0.2%	-0.4%	2.5%	-2.2%	-2.9%	0.6%	-1.0%	0.7%	-4.3%	-3.3%	6.7%
Telecom	high yield	2.4%	0.5%	1.9%	0.7%	-0.4%	0.9%	2.5%	-0.9%	-2.7%	1.9%	-1.2%	0.6%	1.3%	6.2%	10.5%
	s&p 500	-5.2%	-0.9%	-1.1%	2.9%	2.5%	2.7%	5.5%	-7.4%	1.4%	0.0%	-4.0%	0.1%	3.1%	-4.1%	2.5%
Utilities	investment grade	1.4%	-0.3%	-0.6%	-0.8%	1.1%	0.1%	2.1%	-3.0%	-3.2%	0.7%	-0.7%	0.5%	-3.3%	-2.9%	9.5%
Utilities	high yield	-1.5%	1.3%	2.5%	1.2%	-0.7%	0.7%	2.3%	0.1%	-3.4%	1.3%	-1.0%	-0.1%	0.3%	2.6%	4.1%
	s&p 500	2.3%	-7.9%	-0.3%	4.7%	2.4%	5.1%	6.4%	-9.0%	1.1%	3.8%	-5.0%	1.0%	10.0%	3.4%	3.0%

Sources: Scura Paley, Bloomberg

Table 5. Analysis of Selected U.S. Exploration & Production Companies

	Market							LTM Valuation			
	11-Oct-13				market returns[2]				enterprise value		
Company	price	mkt value	MAD[1]	yield	31-Dec-12	30-Aug-13	ltm	cffo[10]	ebitdax	net cap	boe
Anadarko Petroleum Corporation	$95.46	47,988	15.7%	0.75%	28.9%	4.7%	39.1%	6.0x	6.3x	1.74x	$22.25
Apache Corp.[3.]	87.95	34,250	23.4%	0.91%	12.8%	2.6%	3.2%	3.7x	3.6x	1.04x	16.49
Cabot Oil & Gas Corporation	36.75	15,491	6.6%	0.22%	47.9%	(6.1%)	66.0%	16.8x	16.5x	4.91x	25.90
Chesapeake Energy Corporation[4]	26.47	17,616	44.5%	1.32%	61.4%	2.9%	33.2%	4.5x	6.4x	1.07x	13.20
Cimarex Energy Co.	99.60	8,616	9.3%	0.56%	73.2%	18.8%	64.4%	7.8x	8.0x	2.08x	25.24
Concho Resources Inc.	110.29	11,579	23.3%	-	36.9%	14.1%	18.6%	9.9x	10.8x	2.12x	33.76
ConocoPhillips[5]	71.71	87,702	16.9%	3.85%	28.3%	9.1%	31.4%	6.4x	4.9x	1.58x	12.27
Continental Resources Inc.	112.00	20,792	16.9%	-	52.4%	20.1%	42.4%	9.8x	10.8x	3.18x	31.88
Denbury Resources Inc.[6]	18.36	6,847	31.6%	-	13.3%	5.5%	13.5%	6.3x	7.0x	1.19x	22.16
Devon Energy Corporation	60.80	24,685	19.3%	1.45%	18.1%	6.4%	0.0%	4.9x	5.6x	1.18x	10.33
EOG Resources, Inc.	178.99	48,760	9.4%	0.42%	48.6%	13.7%	63.6%	8.3x	8.2x	2.77x	29.74
Linn Energy, LLC	26.45	6,221	50.1%	10.96%	(18.1%)	11.1%	(26.0%)	11.0x	12.8x	1.19x	15.60
Marathon Oil Corporation	34.86	24,739	20.2%	2.18%	15.4%	0.7%	21.4%	4.7x	2.9x	1.23x	15.36
Newfield Exploration Co.	29.17	3,958	44.9%	-	8.9%	20.0%	(12.6%)	4.4x	5.5x	1.17x	12.68
Noble Energy, Inc.	67.00	24,051	10.6%	0.84%	32.5%	9.2%	44.8%	9.0x	8.6x	2.30x	22.71
Pioneer Natural Resources Co.	195.00	27,017	7.3%	0.04%	83.0%	12.1%	87.4%	18.2x	16.8x	2.98x	26.84
QEP Resources, Inc.	29.46	5,282	38.2%	0.27%	(2.5%)	6.9%	(9.1%)	6.4x	8.0x	1.27x	13.03
Range Resources Corporation[7]	78.90	12,892	18.6%	0.20%	25.8%	4.5%	7.9%	19.6x	19.0x	2.97x	14.92
Whiting Petroleum[8]	64.67	7,673	22.5%	-	49.1%	27.5%	38.9%	4.8x	5.9x	1.68x	28.80
Group[9]		436,158	19.3%		32.4%	9.7%	27.8%	8.6x	8.8x	1.98x	$20.69

1. Market Asset Debt Ratio = Net Debt/(Equity Market Value +Preferred Market Value + Net Debt).
2. Returns from date indicated to present. Group returns represent unweighted average of the group.
3. APA pro forma for sale of 239 mmboe GOM shelf reserves for $3.75 billion.
4. CHK pro forma for sale of 140 mmboe Mississippi Lime JV to Sinopec for $1.04 billion.
5. COP pro forma for sale of 42 mmboe Cedar Creek reserves for $989 million.
6. DNR pro forma for acquisition of 42 mmboe Cedar Creek reserves for $989 million.
7. RRC pro forma for sale of 137 bcfe of reserves for proceeds of $257.9 million.
8. WLL pro forma for sale of 35 mmboe of reserves for $860 million.
9. Aggregate totals for group except unweighted averages for returns, valuation, & full cycle statistics.
10. Equity market value as a multiple of net income plus non-cash expenses.

Sources: Scura Paley, Bloomberg, & company corporate filings.

Table 5. Analysis of Selected U.S. Exploration & Production Companies

	Operations											
	mboepd	mmboe	5-year average			ending reserves			per boe			full
Company	prod[11]	reserves	prod cgr[12]	res repl[13]	life[14]	US	Oil	P/D	px[15]	cash cx[16]	repl cx[17]	cycle[18]
Anadarko Petroleum Corporation	749	2,560	7.9%	134%	9.4	74.2%	45.8%	73.6%	$46.93	$16.32	$21.44	124%
Apache Corp.[3.]	790	2,612	8.7%	140%	9.1	49.9%	50.5%	69.5%	58.74	26.39	40.51	88%
Cabot Oil & Gas Corporation	174	640	38.9%	423%	10.1	100.0%	3.8%	59.7%	24.49	6.89	8.91	155%
Chesapeake Energy Corporation[4]	677	2,475	15.2%	310%	10.0	100.0%	30.3%	57.0%	26.48	14.56	25.19	67%
Cimarex Energy Co.	114	376	8.9%	211%	9.0	100.0%	44.6%	80.1%	42.69	14.10	16.68	139%
Concho Resources Inc.	91	447	53.9%	567%	13.4	100.0%	61.2%	60.8%	63.54	25.06	26.76	123%
ConocoPhillips[5]	1,509	8,600	(3.5%)	113%	15.6	42.8%	62.2%	65.1%	63.33	37.85	35.19	87%
Continental Resources Inc.	138	785	40.0%	760%	15.6	100.0%	71.5%	40.5%	69.22	20.00	22.93	161%
Denbury Resources Inc.[6]	74	451	10.6%	626%	16.7	100.0%	82.1%	60.3%	93.48	50.48	16.88	139%
Devon Energy Corporation	698	2,963	1.9%	160%	11.6	75.5%	46.9%	71.6%	30.59	16.26	29.46	67%
EOG Resources, Inc.	506	1,811	11.8%	210%	9.8	91.8%	56.4%	52.5%	52.58	15.69	45.21	86%
Linn Energy, LLC	130	799	41.7%	637%	16.8	100.0%	46.4%	65.2%	38.65	36.64	17.26	72%
Marathon Oil Corporation	506	2,017	8.5%	211%	10.9	32.2%	77.0%	71.7%	71.37	53.70	44.61	73%
Newfield Exploration Co.	106	566	4.8%	190%	14.7	94.0%	48.4%	52.7%	52.19	32.08	58.11	58%
Noble Energy, Inc.	254	1,184	4.0%	206%	12.8	48.6%	30.1%	39.0%	47.65	19.22	21.52	117%
Pioneer Natural Resources Co.	176	1,086	14.1%	165%	16.9	100.0%	66.3%	58.3%	49.97	23.11	36.80	83%
QEP Resources, Inc.	143	656	21.0%	277%	12.6	100.0%	33.4%	53.6%	31.48	15.21	24.61	79%
Range Resources Corporation[7]	152	1,061	24.5%	691%	19.2	100.0%	26.3%	52.6%	27.72	12.37	8.32	134%
Whiting Petroleum[8]	93	344	20.4%	230%	10.1	100.0%	89.3%	63.9%	73.06	24.36	38.27	117%
Group[9]	7,079	31,435	7.1%	193%	12.2	69.5%	51.3%	63.4%	$50.75	$24.23	$28.35	97%

11. Daily production based on latest quarterly results.
12. Production growth represents 5-year compound annual production growth rate.
13. Reserve Replacement Rate = total 5-year net reserve additions divided by total 5-year production.
14. Life of current reserves at most recent quarterly production rate.
15. Average wellhead realized price before hedging.
16. Cash cost = production cost + SG&A + interest expense + capitalized interest + cash taxes + dividends per boe production.
17. Reserve replacement cost represents total reserves added over most recent and 2 prior years, net of revisions, over total costs incurred for the same period plus future development costs in 5 equal future installments discounted at 10%.
18. Ratio of realized price to full cycle cost, which is cash cost + reserve replacement cost.

Sources: Scura Paley, Bloomberg, & company corporate filings.

Table 5. Analysis of Selected U.S. Exploration & Production Companies

	Credit									
	ebitdax		ebitdax/interest			debt/	PV10/	debt/boe		
Company	ltm	2013E[19]	ltm	2013E	xcpx[20]	ebitdax	debt	total	p/d	rating
Anadarko Petroleum Corporation	8,984	9,695	9.49x	10.24x	3.24x	1.51x	3.08x	$5.29	$7.19	Baa3/BBB-
Apache Corp.[3.]	11,835	11,559	21.17x	20.68x	0.39x	1.08x	3.68x	4.89	7.04	A3/A-
Cabot Oil & Gas Corporation	1,003	1,280	16.89x	21.56x	8.65x	1.14x	3.29x	1.78	2.99	NR/NR
Chesapeake Energy Corporation[4]	5,120	5,397	4.58x	4.82x	N.M.	2.55x	1.46x	5.28	9.26	Ba3/BB-
Cimarex Energy Co.	1,191	1,378	13.85x	16.02x	6.00x	0.75x	4.60x	2.37	2.96	Ba1/BB+
Concho Resources Inc.	1,402	1,664	6.28x	7.45x	2.60x	2.51x	2.37x	7.86	12.94	Ba3/BB+
ConocoPhillips[5]	21,695	22,825	17.31x	18.21x	1.82x	1.00x	5.99x	2.53	3.88	A1/A
Continental Resources Inc.	2,320	2,858	13.37x	16.46x	7.72x	1.91x	3.00x	5.66	13.98	Ba2/BB+
Denbury Resources Inc.[6]	1,429	1,505	6.30x	6.64x	4.39x	2.26x	3.35x	7.16	11.88	B1/BB
Devon Energy Corporation	5,489	5,650	11.44x	11.77x	N.M.	1.85x	1.72x	3.43	4.78	Baa1/BBB+
EOG Resources, Inc.	6,544	7,652	23.06x	26.96x	N.M.	0.96x	3.70x	3.49	6.65	A3/A-
Linn Energy, LLC	978	1,459	2.37x	3.53x	0.36x	6.40x	0.97x	7.82	12.00	B2/B
Marathon Oil Corporation	10,641	9,883	35.59x	33.05x	9.40x	0.61x	4.92x	3.22	4.49	Baa2/BBB
Newfield Exploration Co.	1,300	1,410	6.07x	6.59x	N.M.	2.52x	1.81x	5.78	10.97	Ba1/BBB-
Noble Energy, Inc.	3,128	3,733	11.46x	13.68x	4.54x	1.13x	4.90x	2.99	7.68	Baa2/BBB
Pioneer Natural Resources Co.	1,730	2,408	8.21x	11.42x	N.M.	1.63x	3.16x	2.60	4.46	Baa3/BBB-
QEP Resources, Inc.	1,063	1,630	6.32x	9.69x	N.M.	3.20x	1.18x	5.19	9.68	Ba1/BB+
Range Resources Corporation[7]	834	1,052	4.74x	5.98x	2.28x	3.53x	1.51x	2.78	5.28	Ba3/BB
Whiting Petroleum[8]	1,678	1,840	19.66x	21.55x	5.27x	1.34x	3.24x	6.55	10.25	Ba3/BB+
Group[9]	88,365	94,876	12.07x	12.96x	1.96x	1.38x	3.33x	$3.87	$5.99	

19. Estimated 2013 EBITDA based on Bloomberg consensus estimates.
20. EBITDAX minus replacement capex, which represents trailing 12-month production times reserve replacement cost.

Sources: Scura Paley, Bloomberg, & company corporate filings.

Important Disclosures

The information and opinions in this research were prepared by Scura Paley & Company, LLC ("Scura Paley"). For valuation methodology and risks on a particular stock referenced in this research report please email: cwyman@Scura Paley.com or contact Scura Paley at 489 5th Avenue, 15th Floor (Attention: Charles Wyman), New York, NY, 10017 USA.

Analyst Certification
The analyst responsible for this research, Charles Wyman, hereby certifies that his views about the companies and the securities discussed in this report are accurately expressed and that he has not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report. Charles Wyman is a research analyst.

Analyst Stock Ratings
Buy: The stock's total return is expected to exceed the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12 months. **Hold:** The stock's total return is expected to be in line with the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12 months. **Sell:** The stock's total return is expected to be below the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12 months. **Not-Rated:** Currently the analyst does not have adequate conviction about the stock's total return relative to the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12 months. Unless otherwise specified, the time frame for any price targets included in Scura Paley Research is 12 months. Any target price, if discussed, reflects, in part, the analyst's estimates for the company's earnings. The achievement of any target price may be impeded by general market and macroeconomic trends, and by other risks related to the company or the market, and may not occur if the company's earnings differ from estimates.

Distribution of Ratings (Global):
The distribution of all ratings published by Scura Paley Equity Research is as follows: 0% have been assigned a Buy rating which for purposes of mandatory disclosures are classified as a Buy rating; 0% of companies with this rating are investment banking clients of Scura Paley; 0% have been assigned a Hold rating, which for purposes of mandatory disclosures are classified as a Hold rating; 0% of companies with this rating are investment banking clients of Scura Paley. 0% have been assigned a Sell rating which, for purposes of mandatory disclosures, are classified as a Sell rating; 0% of companies with this rating are investment banking clients of Scura Paley.

Price Charts: Not applicable.

Analyst Industry Outlook
Outperform: the analyst expects the performance of his industry coverage universe to outperform SPX over the next 12 months. **In-Line**: the analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be in line with the relevant broad market benchmark, as indicated below. Cautious (C): The analyst views the performance of his or her industry coverage universe over the next 12-18 months with caution vs. the relevant broad market benchmark,

Conflict Disclosures
Scura Paley and its affiliates may trade as a principal in securities and derivatives of issuers that are the subject of this report. Scura Paley or any affiliate could intend to seek or expect to receive compensation for investment banking services from the above companies in the next 3 months.

Disclaimer
Although the information contained herein has been obtained from sources Scura Paley believes to be reliable, its accuracy and completeness cannot be guaranteed. This correspondence is for informational purposes only and under no circumstances is it to be construed as an offer to sell, or a solicitation to buy, any security. At various times we may have positions in and effect transactions in securities referred to herein. Any recommendation contained in this correspondence may not be appropriate for all investors. The recipient must independently evaluate any investment including the tax, legal, accounting and credit aspects of any transaction. Instruments and trading strategies of the type described herein may involve a high degree of risk, and the value of such instruments may be highly volatile and may be adversely affected by the absence of a market to provide liquidity. Additional information is available upon request.

This document may contain information obtained from third parties, including ratings from credit ratings agencies such as Standard & Poor's. Reproduction and distribution of third party content in any form is prohibited except with the prior written permission of the related third party. Third party content providers do not guarantee the accuracy, completeness, timeliness or availability of any information, including ratings, and are not responsible for any errors or omissions (negligent or otherwise), regardless of the cause, or for the results obtained from the use of such content. Third party content providers give no express or implied warranties, including, but not limited to, any warranties of merchantability or fitness for a particular purpose or use. Third party content providers shall not be liable for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including lost income or profits and opportunity costs) in connection with any use of their content, including ratings. Credit ratings are statements of opinions and are not statements of fact or recommendations to purchase hold or sell securities. They do not address the suitability of securities or the suitability of securities for investment purposes, and should not be relied on as investment advice. No part of this article may be reproduced in any form, or referred to in any other publication, without express written permission of Scura Paley & Company, LLC.

Scura Paley Securities, LLC is a member of FINRA and SIPC.