

USING MULTIPLES FOR VALUATION

When do you want to use multiples?

- To double-check other calculations
- Compute multiples for your DCF valuation to compare to industry multiples
- To “bracket” answers
- Especially—for terminal value calculations

Generally speaking, multiples are inferior methods of valuation!

- ⇒ Too affected by one-time events
- ⇒ Difficult to account for future events
- ⇒ Difficult to account for risk differences

TERMINAL VALUE

1. Infinite CF method
2. Multiple of terminal earnings (remember to add in Debt!)—uses P/E ratio
3. Book value of pro forma Debt + Equity in last year
4. $(BV \text{ of Debt} + \text{Equity}) * \text{Market/Book ratio}$
5. $\text{EBITDA} * \text{Market/EBITDA ratio}$
6. etc ...

Methods 3-5 (and similar): Depend on projection of current market ratios into the future.

SOME GENERAL PRINCIPLES

- Choose comparable firms
 - ◇ Exclude “abnormal” firms
 - ◇ Pick firms of similar size, in same industry
 - ◇ etc. (this is harder than it looks!)
- Consider *several* bases for comparison
 - ◇ Not just the P/E ratio (most popular)
 - ◇ Market/Book
 - ◇ The “higher up” the basis, the less manipulable

- Correct for leverage
 - ◇ All other things equal P/E is lower for higher leverage firms
 - ◇ Why? Recall that:

$$\frac{P_0}{E_0} = \frac{b(1+g)}{r_e - g}, \text{ where } g = \text{earnings growth}$$

- ◇ Now consider two firms with same g and same payout ratio b , but with different leverages:

$$\left[\frac{P_0}{E_0} \right]_{\text{low lev.}} = \frac{b(1+g)}{r_e - g} = \frac{50\% (1 + 4\%)}{8\% - 4\%} = 13$$

$$\left[\frac{P_0}{E_0} \right]_{\text{high lev.}} = \frac{b(1+g)}{r_e - g} = \frac{50\% (1 + 4\%)}{12\% - 4\%} = 6.5$$

- Whole firm ratios:
 - * Value to EBITDA
 - * Value to FCF = EBITDA - CAPEX - Δ NWC

(Careful! FCF is often negative! It is negative for ALL the Canadian energy stocks considered at end of lecture.)

- * Value to stores, sq. feet, oil/gas proven reserves, oil/gas production, number of pipeline customers, etc.

TRAILING VERSUS LEADING P/E

Trailing P/E:

$$\frac{\text{current price per share, } P_0}{\text{last reported earnings, } E_0}$$

Leading P/E:

$$\frac{\text{current price per share, } P_0}{\text{estimated next period earnings, } E_1}$$

VALUE LINE

$$\text{"P / E Ratio"} = \frac{\text{current share price}}{\text{sum of **next 4 quarters** of predicted EPS}}$$

$$\text{"Trailing P / E Ratio"} = \frac{\text{current share price}}{\text{sum of **last 4 quarters** of actual EPS}}$$

Note that the P/E model used in Chapter 9 uses the *trailing* P/E:

$$r_e = \frac{b \cdot (1 + g)}{\frac{P_0}{E_0}} + g,$$

although this is, of course, equivalent to *leading* P/E model:

$$r_e = \frac{b \cdot (1 + g)}{\frac{P_0}{E_0}} + g = \frac{b}{\frac{P_0}{E_0(1 + g)}} + g = \frac{b \cdot (1 + g)}{\frac{P_0}{E_1}} + g$$

For valuation

To estimate the value of a share using the P/E ratio:

$$\text{appropriate} \left[\frac{P_0}{E_1} \right] * \text{estimated } E_1^{\text{firm}} = P_0^{\text{firm equity}}$$

or

$$\text{appropriate} \left[\frac{P_0}{E_0} \right] * \text{estimated } E_1^{\text{firm}} = \text{estimated } P_1^{\text{firm equity}}$$

$$\Rightarrow \text{to get } P_0^{\text{firm equity}}, \text{ take } \frac{P_1^{\text{firm equity}}}{1 + r_e(L)} = P_0^{\text{firm equity}}$$

EBITDA

Earnings before interest, taxes, depreciation, and amortization (EBITDA). Management believes that a key measure of cash flow generated is earnings before interest, taxes, depreciation, and amortization (EBITDA). EBITDA is not intended to represent cash flow or any other measure of performance in accordance with generally accepted accounting principles, but is included as a tool for analyzing the Company's financial condition. The following schedule shows the calculation of EBITDA and EBITDA margin as a per cent of total revenue.

(In millions)	1995	1994	1993
Income before income taxes, extraordinary charge, and cumulative effect of accounting change	\$1,341	\$1,699	\$1,554
Financing costs	518	463	461
Depreciation and amortization, including operating leases	481	449	416
EBITDA	\$2,340	\$2,611	\$2,431
Total revenue	\$21,419	\$21,082	\$19,578
EBITDA per cent of total revenue	10.9%	12.4%	12.4%

(From J.C. Penney's 1995 annual report)



Tribune Company Business Segment Data (unaudited)

(in thousands)

	FIRST QUARTER		Percent Change
	1994	1995	
PUBLISHING			
Revenues			
Daily Newspapers	\$ 310,042	\$ 309,418	1
Other Publications/Services/Development	17,291	15,132	14
Total	327,333	324,547	1
EBITDA (1)			
Daily Newspapers	85,134	90,297	(6)
Other Publications/Services/Development	(3,893)	(1,038)	(278)
Total	81,143	89,242	(9)
Operating Profit			
Daily Newspapers	66,173	72,590	(6)
Other Publications/Services/Development	(4,900)	(1,755)	(184)
Total	\$ 61,243	\$ 70,808	(11)
BROADCASTING AND ENTERTAINMENT			
Revenues			
Television	\$ 148,247	\$ 134,060	11
Radio	24,632	24,858	(1)
Entertainment/Chicago Cubs	12,435	15,908	(22)
Cable Programming/Development (2)	1,001	1,606	17
Total	187,195	176,432	6
EBITDA			
Television	41,671	39,021	7
Radio	4,894	4,900	-
Entertainment/Chicago Cubs	(2,657)	(3,703)	28
Cable Programming/Development	(4,055)	(2,456)	(45)
Total	39,853	37,772	6
Operating Profit			
Television	33,082	32,200	3
Radio	4,001	4,398	(9)
Entertainment/Chicago Cubs	(3,732)	(5,101)	27
Cable Programming/Development	(4,327)	(2,773)	(56)
Total	\$ 29,024	\$ 28,724	1
EDUCATION			
Revenues	\$ 22,594	\$ 21,627	5
EBITDA	4,244	1,909	113
Operating Profit	\$ 2,222	\$ (386)	89
CORPORATE EXPENSES			
EBITDA	\$ (7,023)	\$ (6,889)	(2)
Operating Profit	\$ (7,414)	\$ (7,139)	(4)
CONSOLIDATED			
Revenues	\$ 537,122	\$ 521,406	3
EBITDA	110,217	122,154	(1)
Operating Profit	\$ 87,076	\$ 92,034	(5)

(1) EBITDA is earnings before the AOL stock sale, interest, taxes, depreciation and amortization of intangible assets.

(2) Cable Programming/Development includes CLTV News and, for EBITDA and operating profit, the Company's equity income or losses from The WB Network, Quest Broadcasting and TV Food Network.

Time Warner and Time Warner Entertainment Report Record EBITDA for Both the Fourth Quarter and 1996

NEW YORK, February 11, 1997 -- Time Warner Inc. (Time Warner) and Time Warner Entertainment Company, L.P. (TWE), reported record combined earnings before interest, taxes, depreciation and amortization (EBITDA) of \$4.288 billion on revenues of \$20.925 billion for 1996, compared to EBITDA of \$3.308 billion on revenues of \$17.696 billion for 1995. For the fourth quarter, combined record EBITDA was \$1.394 billion on revenues of \$6.744 billion, up 34%, including the businesses of TBS, which Time Warner acquired on Oct. 10, 1996, compared to EBITDA of \$1.038 billion on revenues of \$5.120 billion in the fourth quarter of 1995. Below are EBITDA results for the fourth quarter and full year (in millions):

	Fourth Quarter		Year	
	1996	1995	1996	1995
TIME WARNER				
Publishing	\$ 200	\$ 175	\$ 535	\$ 476
Music	290	295	744	690.*
Cable Networks-TBS	162	--	162	--
Filmed Entertainment--TBS	32	--	32	--
Cable	124	45	476	90
Intersegment Elimination	5	--	5	--
Time Warner EBITDA	\$ 813	\$ 515	\$ 1,954	\$ 1,256
ENTERTAINMENT GROUP				
Filmed Entertainment--Warner Bros.	123	121	546	490
Six Flags Theme Parks	--	--	--	60.**
Broadcasting--The WB Network	(35)	(26)	(98)	(66)
Cable Networks--HBO	91	73	350	293
Cable	402	355	1,536	1,275
Entertainment Group EBITDA	\$ 581	\$ 523	\$ 2,334	\$ 2,052
Combined EBITDA	\$ 1,394	\$ 1,038	\$ 4,288	\$ 3,308

* Includes pretax losses of \$85 million recorded in the third quarter of 1995 related to certain businesses and joint ventures owned by the Music Division which were restructured or closed.

** Deconsolidated as of June 23, 1995, as Six Flags is now 49% owned.

USG CORPORATION REPORTS 7 PERCENT INCREASE IN SALES, 28 PERCENT INCREASE IN EBITDA * FOR 1995

(*Note: As a result of USG's emergence from bankruptcy in May 1993 and the bankruptcy's continuing implications on financial reporting, USG reports EBITDA [earnings before interest, taxes, depreciation, depletion, amortization and items classified as other expense, net] to facilitate the comparison of current results to historical results.)

CHICAGO, January 25, 1996 -- USG Corporation today reported 1995 net sales of \$2,444 million and EBITDA of \$417 million. These results compare favorably with 1994 net sales of \$2,290 million and EBITDA of \$325 million. For the fourth quarter of 1995, USG reported net sales of \$602 million and EBITDA of \$102 million, up slightly and 52 percent, respectively, over the comparable 1994 period. (1995 fourth-quarter and full-year results include a \$30 million pretax [\$24 million after-tax] charge in connection with USG's previously announced exit of the insulation manufacturing business. This primarily noncash charge is included in "Other expense, net" in the Consolidated Statement of Earnings and is not reflected in USG's EBITDA figures discussed above. 1994 fourth-quarter and full-year cost of products sold and EBITDA included a \$30 million charge for previously announced asbestos litigation settlements. Excluding the 1994 asbestos charge, 1995 EBITDA increased 17 percent over 1994.)

Host Marriott Reports 42% Increase in 1996 EBITDA

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Host Marriott Reports 42% Increase in 1996 EBITDA

BETHESDA, Md., Feb. 3 (PRNewswire) -- At an investor conference today, Host Marriott Corporation (NYSE: HMT) reported preliminary 1996 Earnings Before Interest Expense, Taxes, Depreciation and Amortization, and other non-cash items ("EBITDA") of approximately \$442 million, a 42% increase over its 1995 full year results of \$311 million. Revenues for the year are expected to increase by approximately 51% to \$732 million from \$484 million in 1995.

Host Marriott reported that full service hotel EBITDA for the year will increase to \$415 million, a 68% improvement from \$247 million in 1995. The full service hotel EBITDA increase in 1996 is attributable primarily to a 19% increase in comparable hotel EBITDA on an 11% increase in room revenue per available room (REVPAR), as well as incremental EBITDA generated by the company's 1996 and 1995 hotel acquisitions. For the 1996 fourth quarter, the company also reported that comparable hotel EBITDA increased 21% on a 10% increase in REVPAR over the 1995 fourth quarter. Full year and fourth quarter results for 1996 also include 53 and 17 weeks, respectively, versus 52 and 16 weeks, respectively, included in the comparable 1995 periods.

Terence C. Golden, president and chief executive officer of Host Marriott, said, "We are extraordinarily pleased with the financial results we are seeing for 1996. The growth in hotel EBITDA reflects the impact of our 1995 and 1996 hotel acquisitions and the continuing strength of the full service sector of the hotel industry in which we are focused."

Mr. Golden continued, "Through our aggressive acquisition program, Host Marriott was able to acquire, or purchase controlling interest in, 23 hotels (10,881 rooms) in 1996 with an aggregate value of approximately \$1.5 billion. We have already acquired, or purchased controlling interest in, three additional hotels (2,433 rooms) in 1997 with an aggregate value of approximately \$380 million. These exceptional assets, many of which have been included in affiliated partnerships, include some of the nation's premier Marriott convention and resort facilities, as well as four Ritz-Carlton luxury properties."

Mr. Golden added, "Host Marriott is well positioned to experience continued growth as the full impact of these high-quality properties is realized. With a 1997 acquisition target of over \$1 billion, we expect to be able to continue to add high-quality, full-service hotels to our portfolio at attractive returns throughout 1997."

The company stated that it will report fiscal year 1996 comprehensive results of operations in early March.

Host Marriott Corporation is a lodging real estate company which currently owns or holds controlling interests in 82 upscale and luxury full-service hotel properties operating primarily under the Marriott and Ritz-Carlton brand names. The company also serves as general partner and holds minority interests in various unconsolidated partnerships that own 251 lodging properties, 31 of which are full-service hotels.

Certain matters discussed within this news release are forward-looking statements within the meaning of the Private Litigation Reform Act of 1995 and as such may involve known and unknown risks, uncertainties, and other factors which may cause the actual results, performance or achievements of Host Marriott to be different from any future results, performance or achievements expressed or implied by such forward-looking statements. Although Host Marriott believes the expectations reflected in such forward-looking statements are based upon reasonable assumptions it can give no assurance that its expectations will be attained. These risks are detailed from time to time in the company's filings with the Securities and Exchange Commission.

HOST MARRIOTT CORPORATION

Consolidated Financial Data
(unaudited, in millions)

	Seventeen Weeks Ended		Year Ended	
	Jan. 3, 1997	Dec. 29, 1995	Jan. 3, 1997	Dec. 29, 1995
Revenues	\$260	\$165	\$732	\$484
Hotel EBITDA	162	101	439	320
Total EBITDA	159	99	442	311
EBITDA to Cash Interest Expense	--	--	2.0X	1.6X

	Seventeen Weeks Ended Jan. 3, 1997	Year Ended Jan. 3, 1997
Comparable Full-Service Hotel Statistics		
Room Rate Increase	7%	8%
Occupancy Increase	One percentage point	Two percentage points
REVPAR Increase	10%	11%
EBITDA Increase	21%	19%

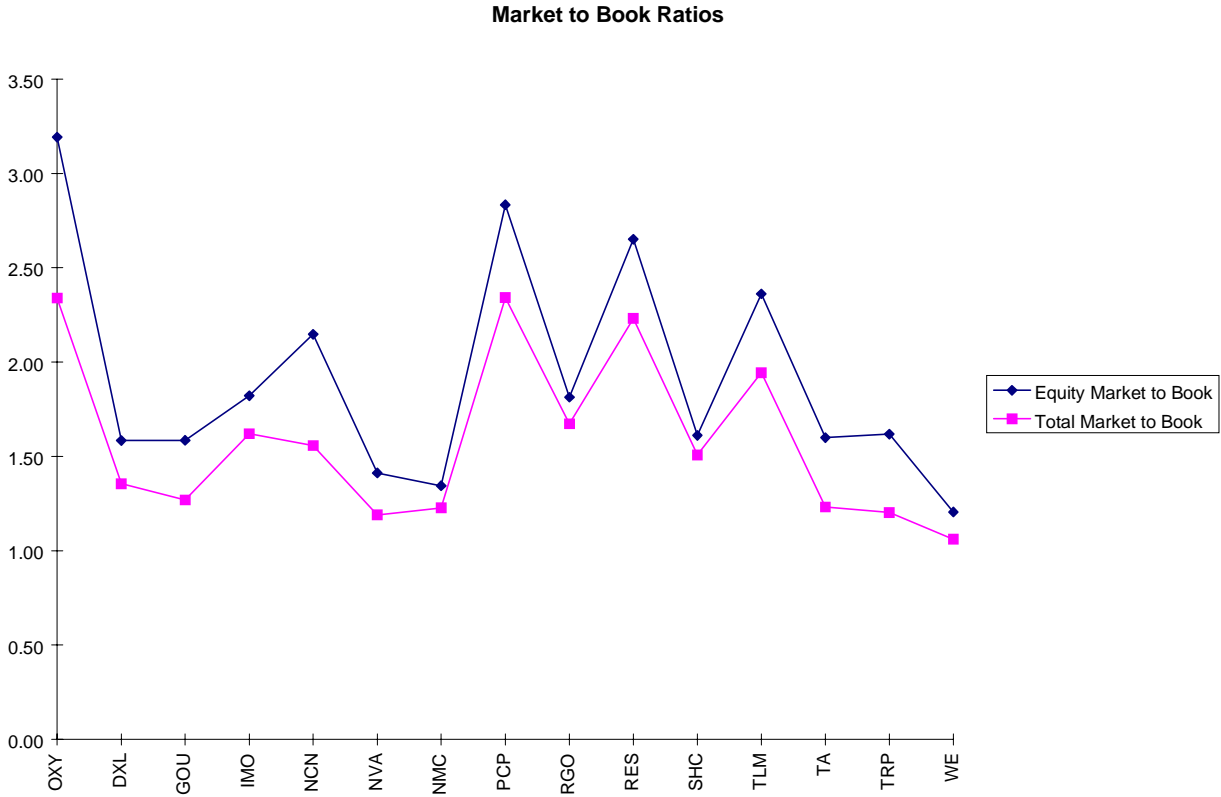
CANADIAN ENERGY STOCKS

Source: *Value Line*, December 27, 1996 (items with *)

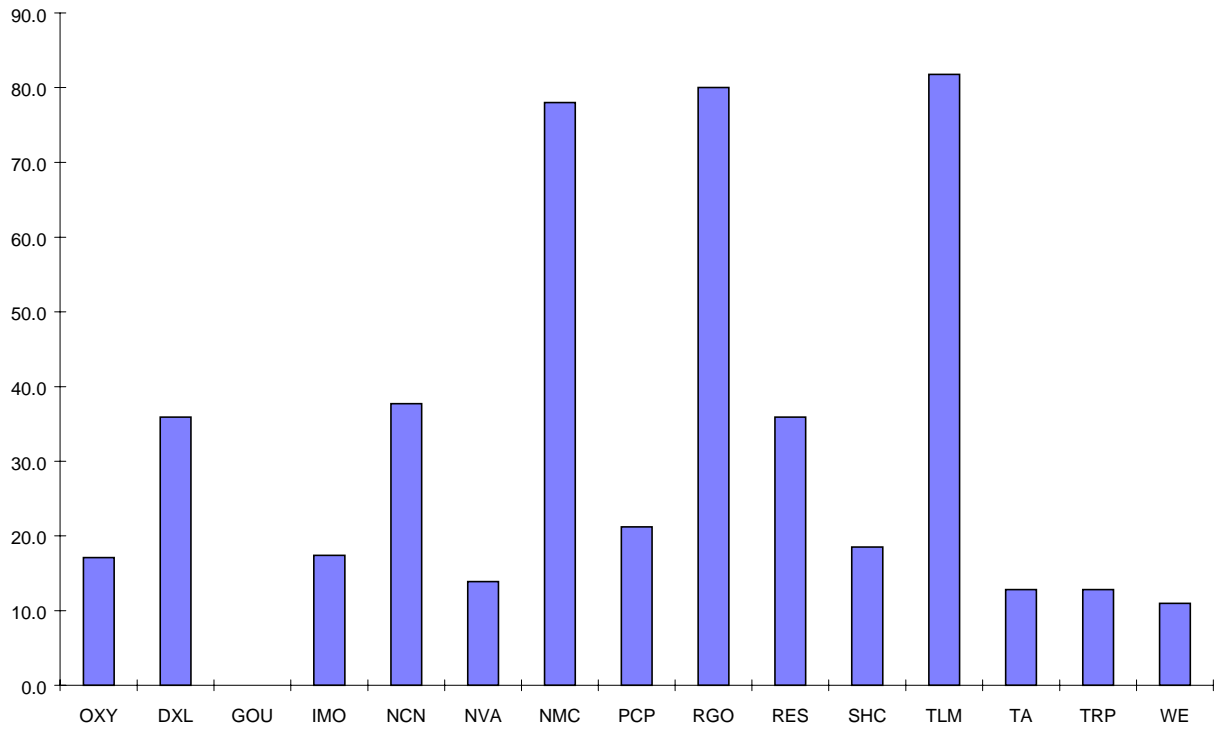
	Currency	Primary Market Sector	Share Price	number of shares	Equity Value (\$ Millions)	BV Debt (\$ Millions)	Cash (\$ Millions)	Preferred	Warrants	Total Firm Value
Canadian Occidental Petroleum	OXY	Can. \$ ex./prod: Can.,US,N.Sea,ME,SA	22	135,500,000	2,981	595.0	81.0	0.0		3,576.0
Dorset Explorer	DXL	Can. \$ ex./prod: W. Can.	6.1	29,100,000	178	72.4	0.0	0.0		249.9
Gulf Canada Resources	GOU	U.S. \$ ex./prod: Can., Indonesia	6.9	244,000,000	1,684	880.6	0.0	427.0	15.8	3,007.0
Imperial Oil	IMO	U.S.\$ integrated oil	43	160,226,000	6,890	1,229.9	421.0	0.0		8,119.6
Norcen Energy Resources	NCN	Can. \$ ex./prod: Can., US, S. Pacific	29	82,973,007	2,406	1,184.9	1.3	0.0		3,591.1
Nova Corporation	NVA	U.S. \$ gas transmission	8.9	468,500,000	4,170	3,466.0	152.0	0.0		7,635.7
Numac Energy	NMC	U.S. \$ ex./prod: W. Can., Libya, Indon.	3.9	93,399,292	364	139.6	39.2	0.0		503.9
PanCanadian Petroleum Ltd.	PCP	Can. \$ ex./prod: W. Can.	53	125,429,416	6,648	858.7	282.1	0.0		7,506.5
Ranger Oil Ltd.	RGO	U.S. \$ ex./prod: N. Sea, Can.	8.8	98,776,000	869	100.0	9.9	0.0		969.2
Renaissance Energy Ltd.	RES	Can. \$ ex./prod: W. Can.	46	107,015,000	4,923	632.7	9.2	0.0		5,555.4
Shell Canada Ltd.	SHC	Can. \$ integrated oil	51	112,000,000	5,712	719.0	439.0	1.0		6,432.0
Talisman Energy	TLM	Can. \$ ex./prod: W. Can., N.Sea, Indonesia	45	108,900,000	4,901	918.3	19.1	0.0		5,818.8
TransAlta Corporation	TA	Can. \$ utility	16	159,000,000	2,544	2,250.6	0.0	271.5		5,066.1
TransCanada Pipelines Ltd.	TRP	U.S. \$ gas pipeline	17	210,000,000	3,570	4,146.0	153.6	379.3		8,095.3
Westcoast Energy, Ltd.	WE	U.S. \$ gas pipeline	17	100,124,000	1,702	3,152.0	0.0	144.2		4,998.3

	Trailing P/E	P/E ratio (leading)	Equity Beta	Asset Beta	Book value per share	Equity Market to Book	Total Market to Book	"Cash flow" per share	Share Price/CF share	1996 EPS	tax rate	Depr. (\$ mill.)	EBT (\$ mill.)	Interest (\$ mill.)
Canadian Occidental Petroleum	17.1	17.6	0.85	0.71	6.89	3.19	2.34	4.60	4.78	1.35	41.5%	440.0	312.7	50.0
Dorset Explorer	35.9	29.0	0.55	0.39	3.85	1.58	1.36	1.15	5.30	0.20	45.0%	27.5	10.6	5.0
Gulf Canada Resources	nmf	nmf	1.10	0.62	4.35	1.59	1.27	1.00	6.90	0.03	50.0%	205.0	14.6	100.0
Imperial Oil	17.4	17.4	0.55	0.47	23.60	1.82	1.62	5.70	7.54	2.10	43.0%	535.0	590.3	102.0
Norcen Energy Resources	37.7	27.4	0.60	0.40	13.50	2.15	1.56	4.75	6.11	0.92	46.0%	360.0	273.0	75.0
Nova Corporation	13.9	12.0	0.95	0.52	6.30	1.41	1.19	1.30	6.85	0.70	25.0%	295.0	77.4	250
Numac Energy	78.0	27.9	0.85	0.61	2.90	1.34	1.23	0.80	4.88	0.11	0.0%	65.0	51.5	8.7
PanCanadian Petroleum Ltd.	21.2	21.5	0.45	0.40	18.70	2.83	2.34	7.25	7.31	2.45	20.0%	600.0	286.0	72.0
Ranger Oil Ltd.	80.0	46.3	0.90	0.81	4.85	1.81	1.67	1.45	6.07	0.13	55.0%	130.0	36.2	6.5
Renaissance Energy Ltd.	35.9	28.6	0.80	0.71	17.35	2.65	2.23	3.85	11.95	1.60	40.0%	255.0	263.4	40.0
Shell Canada Ltd.	18.5	18.1	0.60	0.53	31.65	1.61	1.51	6.10	8.36	2.75	38.0%	380.0	474.7	80
Talisman Energy	81.8	57.0	0.60	0.51	19.05	2.36	1.94	4.55	9.89	0.75	67.5%	420.0	258.5	80.0
TransAlta Corporation	12.8	12.5	0.60	0.30	10.00	1.60	1.23	2.90	5.52	1.25	51.5%	262.9	280.7	180.0
TransCanada Pipelines Ltd.	12.8	12.1	0.70	0.31	10.50	1.62	1.20	2.75	6.18	1.35	40.0%	304.5	357.8	380.0
Westcoast Energy, Ltd.	11.0	10.9	0.65	0.22	14.10	1.21	1.06	4.00	4.25	1.53	33.0%	247.3	479.6	265.0

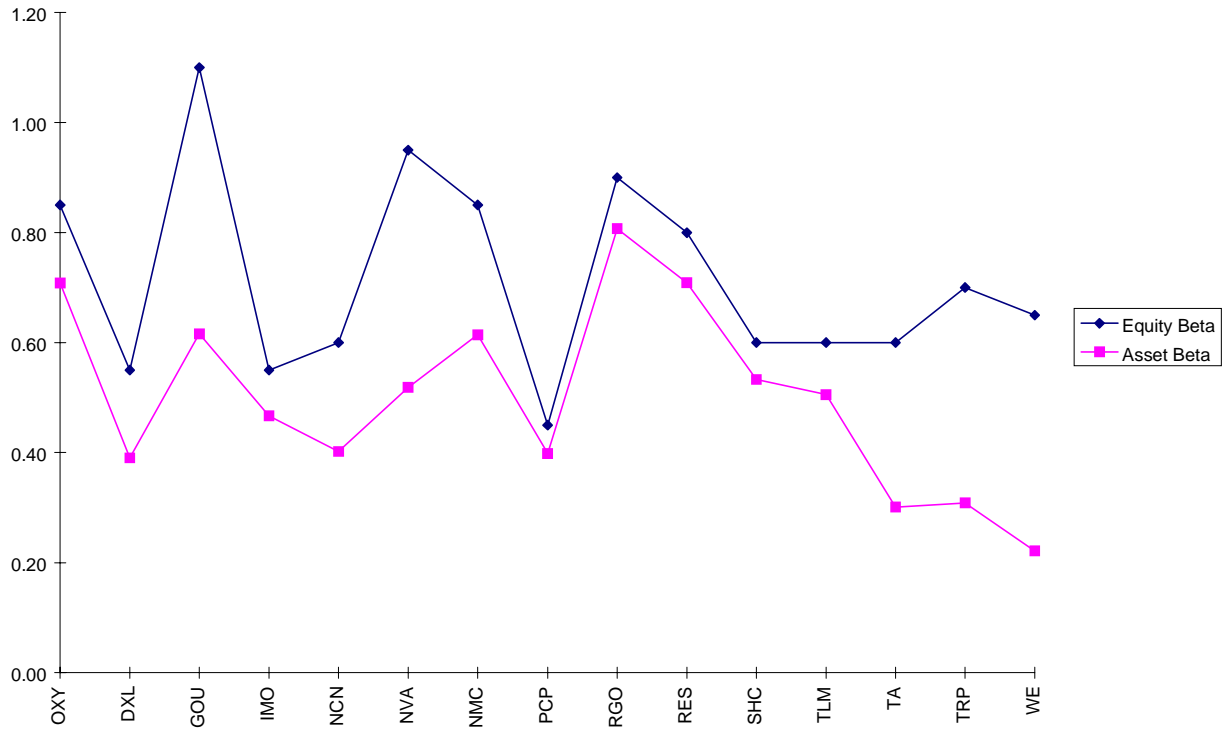
ARE THERE USEFUL MULTIPLES HERE?

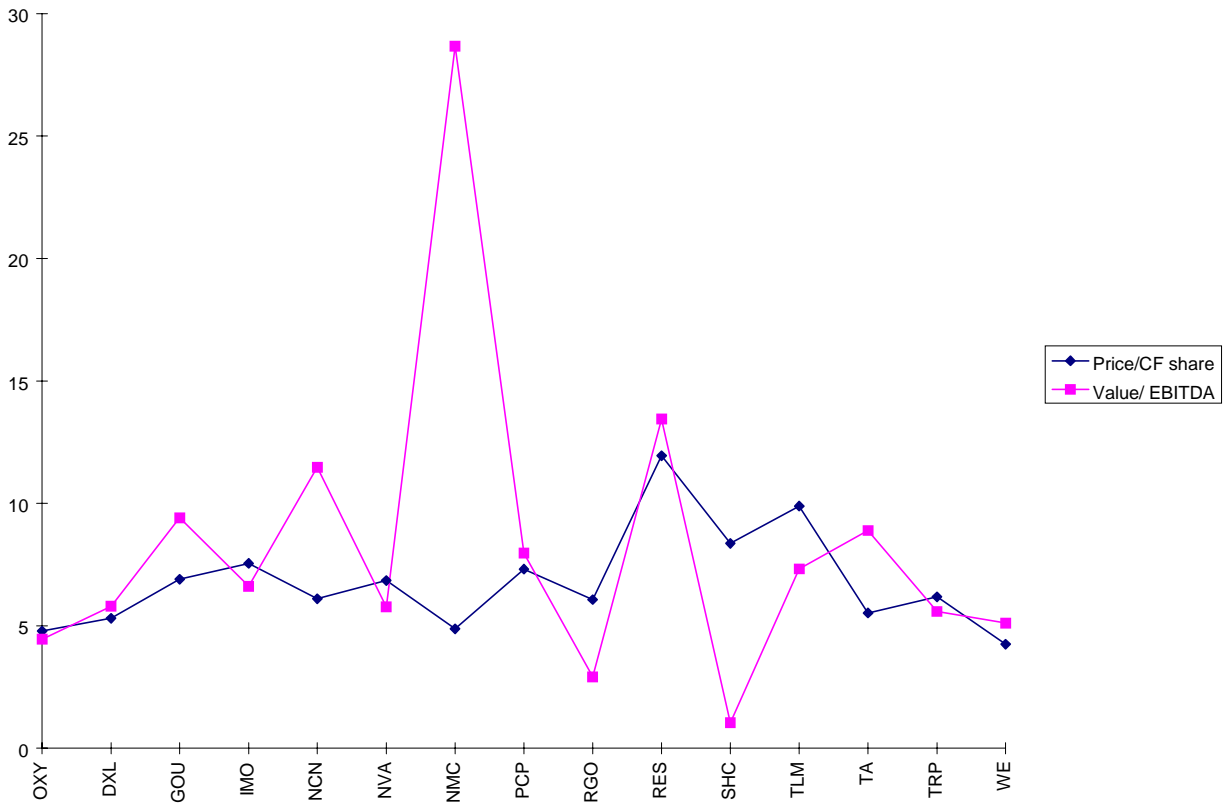


Trailing P/E



Equity and Asset Betas





OTHER MULTIPLES TO CONSIDER FOR ENERGY STOCKS ...

- Value of proven reserves?

Sir--

You point out ("Vagit Rockefeller", July 16th) that Royal Dutch/Shell is valued at \$94 billion, or \$5.36 per barrel of proven reserves, whereas Russia's Lukoil is worth only \$850m, or five cents a barrel. But the value of a barrel of oil in the ground depends on the time taken to get it above ground. Lukoil's reserves are being depleted at 2.36% a year; Shell's, at 6.54%. The annual percentage decline is typically a little less, so a barrel of Shell oil will, on average, be sold in 10.4 years; and a barrel of Lukoil in 29.0 years. If one discounts the receipts at 10%, the present value of Shell's production stream is about one third of the well-head value—not far from an industry rule-of-thumb—whereas Lukoil's present value is only 4.7% of the well-head value. If one discounts Lukoil receipts by 15%, which may not be an excessive allowance for capital scarcity, the present value is a little under 1%.

Therein lies the difference in value between Lukoil and Shell. And it explains why there is a huge gain in applying money and know-how to deplete the Lukoil reserves more quickly. One can only hope that Lukoil and the Russian government will accept that time is money, and that they are better off with a less-than-perfect share of the gains than with holding on to a sterile ownership.

M.A. ADELMAN

MIT

Cambridge, Massachusetts

Note: Professor Adelman is a prominent economist at the Massachusetts Institute of Technology. The letter above (taken from *The Economist* magazine of August 6, 1994) is Adelman's response to an article in *The Economist* discussing the relative values of Lukoil (formerly the Russian state oil company) and Royal/Dutch Shell. Note Adelman's use of NPV to develop a rule of thumb for valuing oil reserves. The applicability to the "Gulf Oil" case is clear.