Paper

Valuation of Oil Company
- a Case Study of a Hostile Take Offer -

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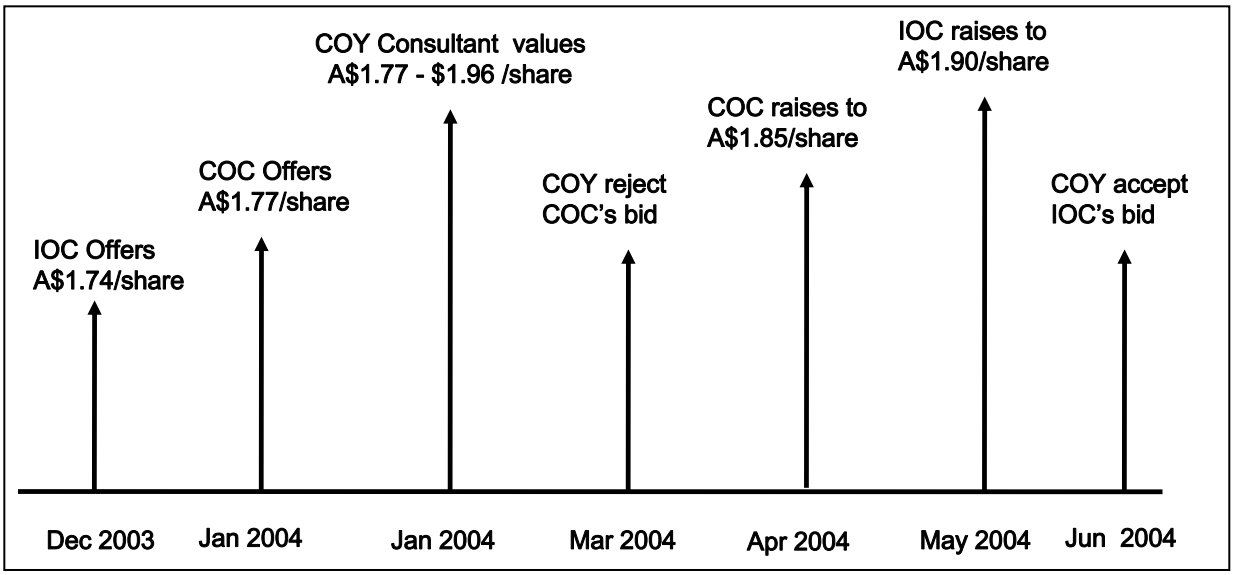
Background

An Oil Company (called: COY) listed in Australian Stock Exchange had a diversified portfolio of oil and gas assets in 7 countries.

The Independent Oil Company (called: IOC) attracted to the exploration upside of some of COY's key Assets and viewed COY as a cost effective company. IOC was interested in acquiring this company in 2003.



On December 2003, IOC started to submit an offering to COY management for A$ 1.74/share. The market price of COY in Stock Exchange on Dec 2003 was around A$ 1.52/share.

After IOC's offering, there was an competitor from other oil company (called: COC) give an offer for A$ 1.77/share on January 2004. Although this offering was higher than IOC, COY rejected it because the consultant hired by COY had suggested that the value of COY should be in range of A$ 1.77 – 1.96 / share

On April 2004, COC raised their offering to A$ 1.85/share. Following this, IOC also raised their offering to A$ 1.9/share on May 2004.

On June 2004, the transaction was closed after no response from COC to increase the bid price. By the end of this month, COY's shareholder agree to accept IOC's offering at A$ 1.9 / share.

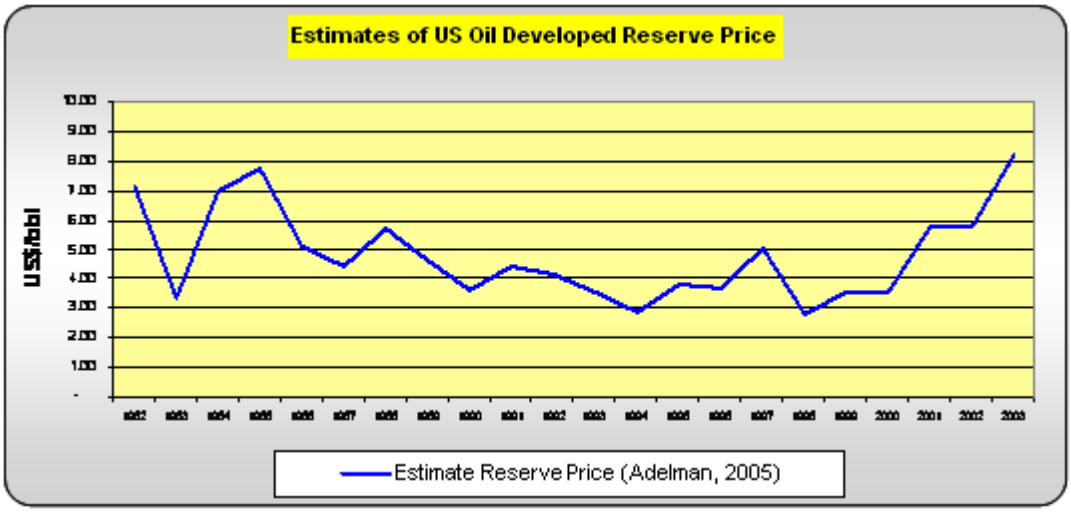
Some analysts said this acquisition price is too high since the average market stock price of COY on December 2003 was around A$1.52/share.

Goals and Methodology

There are two goals of this case study, i.e.:

- What is the fair market value for COY's stock price in 2003 year end?
- Is the closing price for AOC acquisition justified in the oil market situation at that time?

To get the fair market value, we will use the market information regarding the actual reserve price that had been transacted in the last 10 years. This information would be taken from study of Adelman and Watkins in 2005. They studied the estimate average price of actual reserve transaction price in US for period of 1986 – 2003. The results is shown in the below graph.



Based on the above graph, the average transaction price of oil and gas reserve in 2003 is US$ 8.17/bbl. This price would be use as a barrel value of developed reserve in PSS model

Reserve Valuation (1)

There will be three categories of reserve, i.e.:

1. Proved and developed reserve (producing field)
2. Proved and Undeveloped reserve
3. Probable reserve

For category 1 (developed and producing reserves), we can use the traditional DCF as this reserve already in production flow and generate cash flow. The Table below summarizes the producing reserve value based on the free cash flow generated by COY in the end of 2003.

Free Cash Flow (2003) from COY's balance sheets (in million A $):	
Cash inflows from operations	111
Cash outflows for net interests	(12)
taxation	(26)
net operational cashflow after tax	73
Investing	(81)
financing	7
Tax shields	12
Net free cash flow:	**11**
Other parameters	
Annual exponential decline rate from existing prod reserves	15%
Required annual rate of return on COY's assets	17%
NPV (producing reserves)	**40**

We assumed the required rate of return on COY' assets is 17%.
To get the cumulative NPV of producing reserves, future net cash flows from existing producing reserves are assumed to follow an exponential decline over time whose annual rate is 15%.
Under these assumptions the PV of future cash flows arising from existing operations is given by:

$$NPV(\text{producing reserves}) = NCF_0 (1 - \exp[-(d + m)])^{-1}$$

where *d = 15%* is the average annual decline rate, and *m = 17%* is the required annual rate of return on COY's assets, and NCF_0 is the 2003 net cash flow.
The value of developed producing reserves is A$ 40 millions

Reserve Valuation (2)

For reserve category 2 and 3, we will use the PSS model to calculate the development option and exploration option.

Based on the reserve status in 2003 year end, the COY had data as follows:

Net Proven Undeveloped and Probable Reserves Location of the reserves	Proved Undeveloped (mmboe)	Probable reserves (mmboe)	Total (mmboe)
United States Assets	**32.8**	**10.0**	**42.8**
Indonesia Assets	**32.5**	**10.5**	**43.0**
Australian Assets	**5.5**	**6.8**	**12.3**
Middle Eastern Assets	**11.6**	**14.3**	**25.9**
Other Assets (Pakistan and Philippines)	**5.5**	**1.4**	**6.9**
TOTAL	**87.9**	**43.0**	**130.9**

Note: Gas is converted to oil equivalent based on a conversion factor of 6,000 cf / bbl.

Based on the historical cost of exploration, development and production on each area of COC assets, the value of each parameter in PSS model would be assumed as follows (in US$/bbl):

Development Cost Assumption					
	US	**Indonesia**	**Australia**	**Middle East**	**Other Assets**
Development Cost	2.43	1.47	3.44	2.09	2.00
Depreciation allowances for tangible development	50%	50%	50%	50%	50%
Corporate Tax rate	35%	44%	35%	35%	35%
After tax development cost (D)	2.01	1.15	2.84	1.72	1.65
Development Lag	3	3	3	3	3
Payout Ratio Assumption					
	US	**Indonesia**	**Australia**	**Middle East**	**Other Assets**
Market value of a barrel (M)	30.8	30.8	30.8	30.8	30.8
Barrel value of developed reserve (V)	8.2	8.2	8.2	8.2	8.2
Operating costs	2.4	4.9	8.4	1.2	4.3
Operating costs/market value of boe	8%	16%	27%	4%	14%
Depreciation/market value of boe	4%	2%	6%	3%	3%
Production rate	15%	15%	15%	15%	15%
	US	**Indonesia**	**Australia**	**Middle East**	**Other Assets**
Payout Ratio (δ)	19.61%	12.19%	12.87%	20.94%	17.20%
Exploration Cost Assumption					
	US	**Indonesia**	**Australia**	**Middle East**	**Other Assets**
Exploration cost ($/boe)	1.8	1.2	1.8	1.8	1.8
Exploration Lag	2	2	2	2	2

Reserve Valuation (3)

The result of PSS calculation from the above data will be categorized in two options value, i.e. development options for undeveloped reserve and exploration options for probable reserve as seen in the below table (in Aus$ with exchange rate = 0.76 US$/Aus$)..

COY Asset	Undeveloped Reserve (mmboe)	Development Options (A$/boe)	Undeveloped Reserve (A$ million)	Probable reserves (mmboe)	Exploration Options (A$/boe)	Probable reserves (A$ million)	Total Asset Value (A$ million)
United States (US)	32.8	3.328	109.3	10.0	0.224	2.2	111.5
Indonesia	32.5	5.951	193.4	10.5	3.085	32.4	225.82
Australia	5.5	3.577	19.7	6.8	0.615	4.2	23.86
Middle East	11.6	3.468	40.2	14.3	0.220	3.2	77.14
Other Assets	5.5	4.245	23.3	1.4	0.687	1.0	23.80
TOTAL	**87.9**		**385.9**	**43.0**		**42.9**	**462.1**

The value of undeveloped reserves is A$ 385.9 millions and value of probable reserves is 42.9.

The total of EOY assets from three categories of reserves is as follows (A$ million):

1. Proved and developed (producing field) : 40.0
2. Proved and Undeveloped : 385.9
3. Probable : 42.9

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Total Value : 469.2

Share Valuation (1)

Based on the balance sheet status of Dec 31st, 2003 and total value estimate of COY's reserves, the fair market value (FMV) of COY's stock price is A$ 1.62/share, as seen in he below table.

	A$ million
Value of Producing reserves as of 31 December 2003	40
Value of proved and undeveloped reserves	
United States (US)	109.3
Indonesia	193.4
Australia	19.7
Middle East	40.2
Other Assets	23.3
Total	**385.9**
Value of proven and probable reserves	
United States (US)	2.2
Indonesia	32.4
Australia	4.2
Middle East	3.2
Other Assets	1.0
Total	**42.9**
Total Asset values	**469.2**
Net Debt :	
(total Debt-current assets)	(173.5)
Value of Equity	**295.8**
Preferred shares	-
Value of Ordinary shares	**295.76**
Total Ordinary shares (million)	184.0
(allorted and fully paid)	
Value of COY (A$/share)	**1.61**
vs Market Price (Australian Stock Exchange, average 1-31/12/20	**1.52**

This FMV price of A$ 1.61/share is higher than actual average of Dec'2003 stock price i.e. A$ 1.52/share. This difference could be an indicator of the existence of managerial inefficiencies within COY. From this result, we have found the fair market value of COY stock price on Dec 2003 i.e. A$ 1.61/share. This is the result of our first goal of this study.

Share Valuation (2)

The second goal is the reasonableness of the acquisition price at A$ 1.90/share.

As seen in the below table using the same procedure , if the stock price is A$ 1.90/share, the net back value of developed reserve is US$8.50 per barrel. It's a little bit higher with the previous calculation that used US$8.17 based on study from Adelman & Watkins.

Looking the difference assumption of value of developed reserve, it is quite reasonable for IOC to acquire COY at A$ 1.90/share since the oil price tend to going up in 2004.

	A$ million
Value of Producing reserves as of 31 December 2003	42
Value of proved and undeveloped reserves	
United States	123.7
Indonesia	209.3
Australia	22.3
Middle East	45.2
Other Assets	25.9
Total	**426.4**
Value of proven and probable reserves	
United States	4.0
Indonesia	37.4
Australia	6.3
Middle East	5.7
Other Assets	1.5
Total	**55.0**
Total Asset values	**523.0**
Net Debt :	
(total Debt-current assets)	(173.5)
Value of Equity	**349.5**
Preferred shares	-
Value of Ordinary shares	**349.55**
Total Ordinary shares (million)	184.0
(allorted and fully paid)	
Value of COY (A$/share)	**1.90**
vs Market Price (Australian Stock Exchange, average 1-31/12/2003)	**1.52**

“PSS model is useful for valuing share of listed oil company based on the published data”