



Rating Methodology for Upstream Oil Industry

Independent E&P companies engage primarily in the exploration, development, production and sale of crude oil and natural gas. ICRA's assessment of the E&P companies is influenced by the fact that these companies' assets are finite depleting resources subject to unpredictable commodity prices. These companies also need to reinvest substantial amounts to replace depleting reserves. The reserve replacement and financial position of these companies can be affected by volatility in commodity prices and by geological surprises during exploration and production. Over time, the credit quality of such companies is determined by operating returns on invested capital and the money spent in acquiring, finding, and developing acreage and reserves.

The different stages of the E&P value chain are geological & geophysical activity, exploratory drilling, developmental drilling and finally production. The objective of geological and geophysical activity is essentially to identify the presence of hydrocarbons in a particular area. Based on the inputs received from the above stage, exploratory drilling activities are undertaken with the intention of striking oil. The operational risk in the E&P business primarily pertains to the uncertainty associated with striking oil & gas after undertaking these activities. The block could be abandoned at any of these stages, with the probability of abandonment being the highest in the exploratory drilling stage. The process following exploratory drilling, in case oil/gas is struck, is the process of reserve development, which involves identification of areas where the probability of finding oil are the highest and drilling wells for optimal exploitation of these reserves; besides setting up pipelines and processing infrastructure.

The key rating factors can be broadly divided into six categories viz.

- Reserves and Production characteristics
- Re-investment Risk
- Operating and Capital Efficiency
- Marketing Risk
- Regulatory Risk
- Management Risk
- Financial Risk

Reserves and Production characteristics:

Central to the evaluation of an E&P company's credit risk profile is an assessment of the quality, reserve life and nature of its existing geological reserves. A company's reserves are expressed in terms of barrels of oil equivalent (BOE), which are oil, natural gas and condensates expressed on an energy equivalent basis, usually obtained by treating 1000 m³ of natural gas to be equivalent to 1 MT of crude oil. In analysing a company's reserve data, the focus is primarily on proved reserves. Proved reserves come from known reservoirs and can be produced with 'reasonable certainty' under existing economic and operating conditions. Proved reserves can be further sub divided into categories that reflect differences in timing, certainty and capital required to bring these reserves into production. Proved Developed (PD) reserves are reserves, which pertain to existing wells, from where production levels are most certain. Proved undeveloped (PUD) reserves are reserves that are expected to be recovered from new wells on undrilled acreage or from existing well for which a relatively major expenditure is required for recompletion. Two other reserve categories are 'probable' and 'possible' reserves, reflecting lesser certainty levels, due to higher geological, drilling or technological risks. These reserves too need to be evaluated, as they provide an indication of the amount of exploratory capital, which may have to be deployed to bring them to the production stage. Another reserve terminology which is frequently used by E&P companies is 'In-place reserves', which is the total quantum of petroleum which is known to exist in a given region, which may not be fully recoverable and is largely theoretical in nature. A portion of "In place reserves" is what possible to be extractable practically, and is referred to as the 'Recovery factor'. The latter has tended to vary from around 30%-60% in India, depending on the reserve (oil or gas) and basin geology.

As quality of reserves largely determines the credit risk profile of E&P companies, ICRA takes comfort if the reserves are audited & certified by reputed third party reservoir engineering firms. Periodical review of such audits, for the entire portfolio of blocks or the key blocks, would also add comfort from the rating perspective. ICRA also compares the divergence in the reserve estimate by the third party firm and inhouse estimation of the issuer, to see the conservativeness or otherwise of the issuer in estimating reserves.

ICRA considers the following parameters as part of the reserve assessment: production profile, share of PD reserves, level of proved reserves, reserve life index (RLI) and diversification of the fields. An assessment of a company's current and projected production growth and where it will come from is essential to judging credit risk. In addition, the depletion profile of a producing property is essential to assess cash flow coverage, reserve life and reinvestment risk. Integrated oil companies have PD reserves to the extent of 75-80% of the proved reserves. While an increase in the share of PUD is not necessarily a negative, PUDs require capital investment and carry higher geological risk than developed reserves. RLI measures how many years a company can produce hydrocarbons at current production rates until reserves are depleted, assuming no replacement of reserves. It is expressed in years, can be measured on a BOE basis, for either oil or natural gas, or on a total proved or PD basis. Most of the integrated majors have total RLIs on proved reserves in the 12-13 years range, in many cases, bolstered by long gas reserve lives. The independent E&P companies have shorter RLIs in the area of 10 years, but significantly shorter PD reserve lives in the 6-8 year range. A longer PD reserve life generally affords the producer more capital investment flexibility and should offer higher comfort to the debt holders. RLI does

not address reserve quality and it needs to be analyzed along with other reserve characteristics. For (e-g), a long RLI can indicate an increasing % of PUDs, which effectively lengthens the reported total RLI. Diversification measurement typically includes an assessment of geologic basin concentration, number of different basins, % of oil vs. natural gas, onshore vs offshore and number of wells.

Re-investment Risk:

Reserve replacement is the most fundamental challenge an E&P company faces. Because, E&P companies produce their assets to generate cash flow, they are in effect slowly liquidating over time. To sustain the company and service debt in future years, oil and gas that is produced must be replaced with newly discovered or purchased reserves. An E&P company that consistently replaces the oil and gas it produces with fresh reserves - and that does so at economic rates of return-will be more likely to survive economic, industry and commodity cycles and be able to service its debt over long periods of time. Key rating metrics which are considered by ICRA are Reserve Replacement Ratio (RRR) and three year finding & development (F&D) costs in \$/BOE. RRR, a key measure of drilling & operating success, is the ratio of reserves added in a given year versus that year's production. F&D costs/BOE is a unit measure of the total cost incurred to add and develop a barrel of new reserves to the point of production. The lower a company's F&D costs, the more profitable its oil & gas activities will be under a wider range of price environments. F&D costs are best measured over a period of years (3 year) to catch the inherent lag between capital spending and booking of reserves and to reduce distortions caused by one-time events. F&D costs can be further refined to look at all sources (acquisitions+exploration+development) and from drilling only (exploration+development) to better judge a company's drilling success. Industry wide, F&D costs have been rising steadily since the late 1990's, lower drill bit replacement, rising oil field services costs, more remote higher risk drilling areas, increase in manpower costs and equipment cost (pipelines, platforms, compressors etc).

Operating and Capital Efficiency:

E&P companies are in a commodity business wherein a company is a price taker. To achieve competitive margins, companies must control their cash operating costs, in addition to the capital costs. Furthermore, E&P companies are highly capital intensive, constantly reinvesting capital and raising external debt and equity capital. Companies must show sufficient returns on investment to capital providers relative to the risk that investors are taking in. The operating and capital efficiency factor measures an E&P company's cost structure through the full cycle costs metric. Full cycle costs include cash operating and financing costs on a per BOE produced basis plus three year all sources F&D costs. For the marginal BOE of production, full cycle costs represent the average cash cost to produce that BOE plus the amount of capital that the company will need to spend to replace that BOE, assuming that historical F&D costs are a good predictor of future F&D costs. Another key metric that is considered is 'leveraged full cycle ratio'. The latter reflects the productivity of reinvested capital on a BOE basis, comparing the cash generated by a BOE of production relative to the capital required, in terms of F&D costs, to replace that BOE. Leveraged full cycle ratio is computed as follows:

Leveraged Full Cycle Ratio =Cash margin per BOE production/Three year avg. all sources F&D costs per BOE

where Cash Margin per BOE production = Sales realisation per BOE production-(operating costs + G&A expense+ Interest costs) per BOE production

Marketing Risk:

As India has been in deficit in both crude oil and natural gas, marketing of these commodities per se is not a challenge for the producers. Under production sharing contracts (PSCs), GoI itself either nominates the buyers (for crude oil) or has priorities set for the allocation (for natural gas). However, credit worthiness of counter parties is a factor that needs to be evaluated. While the credit risk profile of crude oil buyers in general has been robust in India, gas marketers at times have to contend with weak counter parties in the utilities space .

Adequate evacuation arrangements for oil and gas can also influence the effective realisation an E&P player fetches for its oil and gas. While pipeline is the most preferred and economical mode of transportation for both oil and gas, producers some time resort to other modes of transport such as trucks in the case of oil fields where pipeline option is not feasible or where there are delays in laying the pipelines.

Regulatory Risk:

E&P companies in India are significantly impacted by the regulations governing the sector. While the Petroleum and Natural Gas Regulatory Board (PNGRB) does not wield much power to regulate the E&P industry, GoI regulates the industry in several ways which can impact the profitability of the incumbents. Such regulations include approval for price setting formula, prioritisation of customers, direction to the PSUs to share the under recoveries of Oil Marketing Companies (OMCs), control on APM prices, differential pricing for customers in North-East region and methodology for computation of royalty. Besides GoI, Director General of Hydrocarbons (DGH) also regulates the industry in several ways which includes approval of development plans of discovered fields, optimal extraction of reserves and monitoring the performance obligations of the successful awardees under NELP auctions, The manner in which these guidelines / norms affect a company's profitability is a key attribute analysed by ICRA.

ICRA also notes that, in a bid to increase the energy security, leading E&P companies in India have made investments in blocks in several overseas countries, which have different regulatory regimes governing the sector. This exposes such companies to an entirely different set of regulatory , geo political and event risks. The risk is partially mitigated for PSU E&P companies, who are aided by the bilateral treaties at the Government to Government levels for investment protection. Besides, some of them acquire assets in a consortium with other oil companies thereby diversifying their acquisition risk.

Management Risk:

All debt ratings necessarily incorporate an assessment of the quality of the issuer's management, as well as the strengths/weaknesses arising from the issuer's being a part of a "group". Also of importance are the issuer's likely cash outflows arising from the possible need to support other group entities, in case the issuer is among the stronger entities within the group. Usually, a detailed discussion is held with the management of the issuer to understand its business objectives, plans and strategies, and views on past performance, besides the outlook on the issuer's industry. Some of the other points assessed are:

- Experience of the promoter/management in the line of business concerned
- Commitment of the promoter/management to the line of business concerned
- Attitude of the promoter/management to risk taking and containment
- The issuer's policies on leveraging, interest risks and currency risks
- The issuer's plans on new projects, acquisitions, expansion, etc.
- Strength of the other companies belonging to the same group as the issuer
- The ability and willingness of the group to support the issuer through measures such as capital infusion, if required.

Financial Risk:

Cost structure of E&P companies is influenced by the statutory levies (royalty, cess, profit petroleum and sales tax), besides the operating costs. While the statutory levies for nominated blocks are set by Gol and which are subject to change from time to time, in the case of NELP1 blocks and Pre-NELP2 blocks, they (profit petroleum³) have been bid by the E&P companies during the bidding rounds. Depending on the life cycle of the E&P field, profit petroleum payments can vary according to the level bid by them. Thus, the YoY effective cash generation can be significantly influenced by the level of statutory levies.

In order to assess the issuer's current financial position, trends in profitability, gearing, coverage and liquidity are also analysed. These are discussed below:

Operating profitability: The analysis here focuses on determining the trend in the issuer's operating profitability and how the same appears by peer comparison.

Gearing: The objective here is to ascertain the level of debt in relation to the issuer's own funds and is viewed in conjunction with the business risks that the issuer is exposed to. For higher rated E&P companies, inter-alia, ICRA expects E&P companies to have low financial

¹ New Exploration Licensing Policy (NELP) was launched by Gol in 1999 to attract the much needed private sector investment in E&P sector with attractive fiscal terms.

² Privatization of E&P sector was carried out on a limited scale by Gol in the early 1990's and upto 1999, when NELP was launched. Blocks awarded during this limited privatization are referred to as Pre-NELP blocks. Till the aforementioned limited privatization, blocks were awarded to the PSU E&P companies on a nomination basis.

³ Profit petroleum is a biddable component as part of the bidding under NELP and Pre-NELP regimes. Simply put, after recovering the costs (exploration costs, development costs and operating expenditure), the operator shares the profit with Gol based on certain Investment Multiple or on Pre tax IRR basis (for some Pre-NELP blocks).

leverage in order to offset the high business risk. Leverage and cash flow coverage factors measure financial risk by comparing a company's debt to the assets that supports its debt and by analyzing post capex cash flows in relation to its debt. Key metrics analysed under this include Debt/PD reserves, (Debt+future development capital+abandonment costs)/total proved reserves and (RCF-sustaining capex)/Total Debt.

ICRA also notes that leading E&P companies in India have been acquiring assets abroad on a limited scale and would like to expand their scope further. As such acquisitions could be at high valuations, because of competition, and also capital intensive, an under leveraged capital structure could support such acquisitions without materially affecting the credit risk profile.

Debt service coverage ratios: Here, the trends in the issuer's key debt service coverage ratios like Interest Coverage and Net Cash Accruals/Total Debt are examined.

Working capital intensity: The analysis here evaluates the trends in the issuer's key working capital indicators like Receivables, Inventory and Creditors, again with respect to industry peers.

Some of the other aspects that are also analysed include the following:

- **Cash flow analysis:** Cash is required to service obligations. Cash flows reflect the sources from which cash is generated and its deployment. Analysed here are the trends in the issuer's Funds Flow from Operations (FFO) after adjusting for working capital changes, the Retained Cash Flows, and the Free Cash Flows after meeting debt repayment obligations and capital expenditure needs. The cash flow analysis also helps in understanding the external funding requirement that an issuer has, to meet its maturing obligations.
- **Foreign currency related risks:** Such risks arise if an issuer's major costs and revenues are denominated in different currencies. Examples in this regard would include companies selling in the domestic market but making large imports, and export oriented units operating largely on the domestic cost structure. The foreign currency risk can also arise from unhedged liabilities, especially for companies earning most of their revenues in local currency. The focus here is on assessing the hedging policy of the issuer concerned in the context of the tenure and nature of its contracts with clients (short term/long term, fixed price/variable price).
- **Tenure mismatches, and risks relating to interest rates and refinancing:** Large dependence on short-term borrowings to fund-long term investments can expose an issuer to significant re-financing risks, especially during periods of tight liquidity. The existence of adequate buffers of liquid assets/bank lines to meet short-term obligations is viewed positively. Similarly, the extent to which an issuer would be impacted by movements in interest rates is also evaluated.
- **Accounting quality:** Here, the Accounting Policies, Notes to Accounts, and Auditor's Comments are reviewed. Any deviation from the Generally Accepted Accounting Practices is noted and the financial statements of the issuer adjusted to reflect the

impact of such deviations. ICRA notes that nature of the accounting policy adopted by the E&P companies can significantly influence the level of reported book profit. As per the guidance note of ICAI, E&P companies in India are free to adopt either the “Successful Efforts Method” (SEM) or the “Full Cost Method” (FCM). As per the former, expenditure relating to the dry wells are written off in the year they are determined to be so; whereas as per the latter policy, such expenditure are capitalised and are written off during the life of the other producing wells using the “unit of production” method. From the rating perspective, ICRA is of the opinion that SEM is more conservative than FCM as the sunk costs are written off upfront and also notes that leading E&P companies globally and in India follow this method.

- **Contingent liabilities/Off-balance sheet exposures:** In this case, the likelihood of devolvement of contingent liabilities/off-balance sheet exposures and the financial implications of the same are evaluated.
- **Financial flexibility:** As the E&P business is capital intensive, ability to raise resources from the capital or loan market at competitive rates will be a key rating strength, especially if a larger share of the fields is in exploratory or developmental stage. On the other hand, if an issuer has a large proportion of its assets in the production stage, cash flows from them can partly/fully support the exploration and development capex, besides also enhancing the ability of the company to raise capital from the markets.

Summing up...'

As in other manufacturing sector ratings, rating of upstream companies involves an assessment of business risk, management risk and financial risk profile. While the geological risks, high capital intensity and cyclicity in the upstream sector exposes it to a high business risk profile, that can be partly offset by adoption of prudent business and financial risk mitigants discussed above. The final rating judgment is based on both quantitative and qualitative factors, with more emphasis on future cash flow generation and debt servicing ability.



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