

## Taking The “PIM” Approach When Assessing U.S. Energy Companies’ Risk Management

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Standard & Poor’s Ratings Services is expanding its review of U.S. energy firms’ risk-management practices. Our review will be more formalized than in the past, and will concentrate on arriving at an overall evaluation of a firm’s risk-management quality. The review will initially be conducted for energy companies with large trading and marketing operations; however, the intent is eventually to review all energy companies. We consider a company to have significant trading and marketing operations if it transacts in the market daily, has open commodity positions, and uses financial and/or physical transactions to hedge those positions.

Under the expanded framework, we will analyze a company’s policies, infrastructure, and methodologies (PIM).

### Objective

While the objective of the review is to better understand a company’s overall risk profile, the focus is on the effectiveness of a firm’s risk-management practices. The PIM approach is intended to be able to evaluate more closely a firm’s overall risk-control practices, and to benchmark the quality of risk management. The PIM approach will be tailored later in 2006 to incorporate aspects that are more appropriate for energy companies without trading operations. We would expect each company to adapt its risk-management practices to the specific culture, markets, and businesses in which the company operates. For instance, if a company engages in complex risk taking, we would expect that company to have properly identified the risks and have more complex risk-measurement tools that are well understood by management and communicated to all stakeholders. On the other hand, a simple business model may not require a complex risk management framework.

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## Implementation In The Credit Rating Process

As information is gathered, we will look to incorporate findings into the management and governance score of our existing business risk profile. Currently, there are five broad categories of risk that determine a company’s business risk profile. These include regulation, markets, competitive position, management and governance, and operations. So, for instance, if a company is considered to have poor risk-management practices and we determine that strong risk management is important for the firm’s creditworthiness, the overall business risk profile score could suffer.

## The PIM Approach

Standard & Poor’s developed the PIM approach to analyze risk-management practices in its Financial Institutions group and is in the process of implementing a similar evaluation process in its Insurance group. PIM focuses on three key aspects of a firm’s risk-management practices:

- Policies, including business strategy, risk tolerance, risk authorities and disclosure (e.g., internal and external reporting),
- Infrastructure, including personnel, operations, data, and technology, and
- Methodology, including Value at Risk (VaR), stress testing, valuation techniques, model vetting, and performance measurement.

The relative importance of each of these aspects in forming our opinion of a company’s risk management quality will depend on the complexity, size, and range of risk for each company.

### Policies

In the policy dimension of the framework, Standard & Poor’s will assess several key components that include linking the risk tolerance with the business strategy, as well as the approved risk authorities. In other words, we will determine if the company has a clearly understood and articulated risk tolerance policy and whether it is consistent with the company’s goals. The company’s risk-management culture is a key component of the policy dimension and includes an effective disclosure of the risk. A characteristic of a more favorable risk-management culture is proper corporate governance to support risk management through effective board access, authority, and management reporting.

Standard & Poor’s will specifically look to ensure that the risk authorities of each business, as well as the overall firm, reflect the firm’s desired tolerance. For instance, a company that says it wants to grow earnings 15% annually but has an internal corporate policy that defines a small risk appetite would be viewed as having an inconsistent risk culture. On the other hand, a company that clearly articulates internally and externally the amount of risk that it is taking and has invested in appropriate risk-management tools and policies would be viewed favorably.

We will examine the processes the company has in place both to monitor risk authority limits and to enforce effective consequences for exceeding those limits. A company’s disclosure and communication of its key risks and their effect on cash flow will be a key determinant of good practices. We will examine the quality of disclosure internally through a review of management risk reports and externally through public filing. The intent is to ensure that risks are clearly understood and disseminated.

Standard & Poor’s will place a great deal of emphasis on risk governance process, including the way a company defines and enforces its risk culture. A strong and independent risk management function will be viewed positively.

Table 1 presents some aspects that we would view as favorable and unfavorable policies.

Table 1

<b>Policies</b>	
<b>Favorable</b>	<b>Unfavorable</b>
Corporate commitment to risk management	Risk function is not independent of the business it is attempting to control
Clearly defined and communicated risk-management policies	Senior management does not understand the nature or magnitude of the firm’s risks
Communication with board on risk positions and risk programs	Management’s expression of its risk appetite is unclear or ill-defined
Independent risk management function	Accountability for risk is ill-defined
Consistency between business strategy and risk	New products can be executed without the approval or scrutiny of risk control
Engagement of senior management in the risk-management process	New risks appear on the books without prior knowledge of risk or senior managers
Risk limits that reflect risk tolerance and capital deployed	Risk policies are vague, incomplete, or routinely misinterpreted and arbitrated
Compensation that is tied to achievement of risk-management objectives	Employees are generally unaware of the risk process and there is a lack of internal risk education
Capability to provide disclosure that makes risk transparent	Risk reporting cannot be done on a timely basis or is persistently inaccurate
Ability to communicate the main drivers of financial and nonfinancial risks	Sources of profit and loss cannot be determined and monitored
	Positions and trades cannot be reconciled to the firm’s official books
	Risk limits are not documented and provide no audit trail
	Exact legal counterparty cannot be verified
	Collateral to secure trades cannot be verified; ongoing valuation of collateral is inadequate
	Firm has excessively large market share of risk-sensitive business in a certain sector
	Excessive concentration of risk in illiquid assets and long-term contracts

## Infrastructure

The infrastructure dimension of the PIM approach concentrates on four key attributes: people, technology, data, and operations.

The first attribute of infrastructure that we will examine is the quality of the risk-management organization. The qualifications of the staff will include an evaluation of the staff’s seniority, career path, and compensation. We will also examine the education level and the quality of the training of the staff, as well as the overall risk-management budget

The second attribute is technology. Energy firms are increasingly using sophisticated computer technology to manage risk. Standard & Poor’s will look to ensure that there is integration of computer systems that will enable the company to manage risk across the company. Of course, we would expect the technology employed to be commensurate with the firm’s risk-taking activity. If a firm takes complex risks (those that have the ability to change significantly within a short time period), we would expect the company to have more sophisticated technology than a company that has a simpler business model. Integrating technology across the firm will allow a company to analyze concentration risk, as well as overall risk, more comprehensively, and will be looked upon favorably.

The third aspect of infrastructure that we analyze is data. Here, Standard & Poor’s will examine the data integrity, including the data’s quality. The source of the transaction and market data the company uses in its risk-management process is important.

The fourth attribute is the operational component that relates to mid- and back-office activities of the trading operation. Here, Standard & Poor’s will review the quality of the people, controls, and processes of the trading operation.

Table 2 presents some aspects of what would represent favorable and unfavorable risk practices in terms of infrastructure.

Table 2

<b>Infrastructure Risk Practices</b>	
<b>Favorable</b>	<b>Unfavorable</b>
Qualified risk-management staff	Risk officers are not active/visible in the risk-management process and are easily intimidated by business managers
Adequate training and budget available to risk-management staff	Inaction on critical risk decision occurs with frequency
Compensation linked to achievement of risk-management objectives	Business managers regularly appeal negative risk decisions
Proper infrastructure to support risk management	Models and analytics are used blindly without full understanding of underlying assumptions
Data is validated and timely	Risk-limit structure does not control the risks it is intended to control
Appropriate controls regarding data usage	Risk policies are not applied consistently
Technology consistent with risk tolerance and business strategy	Risk takers are not required to input their risks into authorized systems
An integrated risk data warehouse for better and faster risk decisions	Off-system risks are permitted to grow without constraint
	Multiple sources of data are used to compute risk/financial/control information for the same business
	A fragmented risk infrastructure

## Methodology

The methodology component of the PIM approach will be tailored to the specific business model. For energy companies with trading operations, the methodology dimension focuses on the ability of the risk measurement tools to capture the risk associated with the unique nature of the energy markets for market, credit, and operational risk. For example, the measurement of market risk for energy trading markets needs to capture the price spikes and the energy markets’ mean reversion properties. Many derivatives pricing and risk models are based on very questionable assumptions about individual and joint market behavior, as well as portfolio dynamics. For example, the assumptions of “normality” or “lognormality” of returns, or the use of volatilities and correlations for derivatives pricing and risk modeling still “contaminate” most models. Energy markets are particularly “non-normal,” and any model that uses volatilities and/or correlations as parameters are approached with caution.

The quality of the model vetting process, as well as a demonstrable ability to back test the models, will be viewed as particularly important. For example, CAO Singapore—the Singapore-listed subsidiary of state-owned China Aviation Oil Holdings and China’s largest jet fuel supplier—announced last December that it had filed for court protection after it suffered a speculative derivatives trading loss of US\$550 million. An analysis of the trades associated with CAO clearly points out that there was widespread gross negligence and an overly lax control

structure. Options were valued according to their “intrinsic value” for several months. The CAO example provides a textbook example of why firms must periodically vet models associated with any complex energy-trading derivative business.

Standard & Poor’s will review the measurement tools of how a company harmonizes the use of VaR and stress testing within the organization. For example, how are both VaR and stress testing used for defining the risk appetite and for limit setting? Our view is that VaR has limitations and we would view favorably a firm that uses more than one measurement tool for risk measurement. For instance, a company that supplements stress testing and scenario analysis with other measures will likely have a broader understanding of its risks than one that relies solely on VaR for market risk measurement.

We will also examine how a company measures its credit and operational risk. Here we are looking for the process the company goes through to select the specific measurement tools and why they think these tools are good indicators of the magnitude of the risk. For example, it is particularly important that estimates of potential credit exposures incorporate complicating features in the energy trading markets, such as the possibility of price spikes, which can dramatically alter credit exposures very quickly. We will examine whether the credit methodologies take into account such possibilities using a simulation framework that uses realistic price processes that can accommodate empirically important features such as mean reversion and jumps, seasonal factors in the forward price curve, and changes in volatilities and other model parameters.

The type of operational risks that energy and commodity trading firms face is considerably different from the operational risks faced by financial services firms. For example, risks arising from operating assets and from transporting physical commodities are considerably different from those that banks face. The operational loss data required to measure operational risk with advanced models is not typically generated or stored by most firms, and therefore it will take years and a significant investment to be able to effectively calculate operational risk. Nevertheless, we view the measurement of operational risk as being particularly important to favorable risk management.

We will also concentrate our analysis on whether or not specific measurement tools are tied to performance. Importantly, we will look to ensure that management fully understands and appreciates the risk associated with the models. Good risk management practice would require that all model vetting and back testing be done independent of the profit center.

The last element of the methodology dimension of the PIM approach deals with capital attribution and risk-adjusted performance of the portfolio. In other words, we will examine closely the energy trading firm’s ability to appropriately attribute economic capital as well as measure risk-adjusted performance. What we are evaluating is how the company attributes capital to the trading operation. Is it VaR based, or are there other metrics used for capital attribution? Also, we will examine how the company uses the performance metrics to manage the portfolio

Table 3 presents some aspects that would be considered favorable and unfavorable risk practices in terms of methodology.

Table 3

<i>Methodology Risk Practices</i>	
<i>Favorable</i>	<i>Unfavorable</i>
Metrics used to quantify risk and manage limits are identified	Risks are not identified correctly
There is an understanding of how metrics influence decision making	The firm experiences losses (gains) that are greater than expected or are a complete surprise
Independent validation of models	Risk analytics used to compute exposures routinely underestimate or overestimate the amount of risk taken

Table 3

<i>Methodology Risk Practices (cont. 'd)</i>	
<i>Favorable</i>	<i>Unfavorable</i>
Measurement tools capture all of the unique aspects of risk for energy trading	Less sophisticated model for measuring credit, market, and operational risk
For VaR measurement, the model recognizes that volatilities are not static, but rolling	Stress tests are not used
Liquidity risk analysis through a dynamic VaR framework	Models are not independently vetted or backtested
Measurement tools recognize that correlations are not static	Risk factors are not periodically evaluated
Measurement tools capture basis, spreads, and differentials	
A well-defined program of stress tests	
Stress tests capture the idea that volatility can double and correlations can break down	
Risk factors are evaluated periodically	
Credit risk measurement incorporates probability of default and rate of recovery	
Operational risk is measured	
Use of risk-adjusted return on capital that has been implemented in a fully sophisticated integrated environment	
Reports support compliance with risk policies	
Reports effectively control business activities and disclose risks on a timely basis	

### Down The Road

Over time, Standard & Poor’s expects to provide qualitative and quantitative assessments of a company’s risk management. Initially, the PIM approach will provide a more qualitative analysis. But we will also examine selected quantitative aspects of discrete risks associated with liquidity, market, credit, and operational risks. We are also mindful of the unique risks in the energy markets .For example, one of the challenges for energy and commodity trading firms is the treatment of physical assets, which are not generally considered as liquid assets for capital calculations. Initially, as indicated above, this approach will be applied to energy companies with trading operations. Down the road, Standard & Poor’s will look to apply a similar approach to assess the risk-management practices of all energy companies.

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