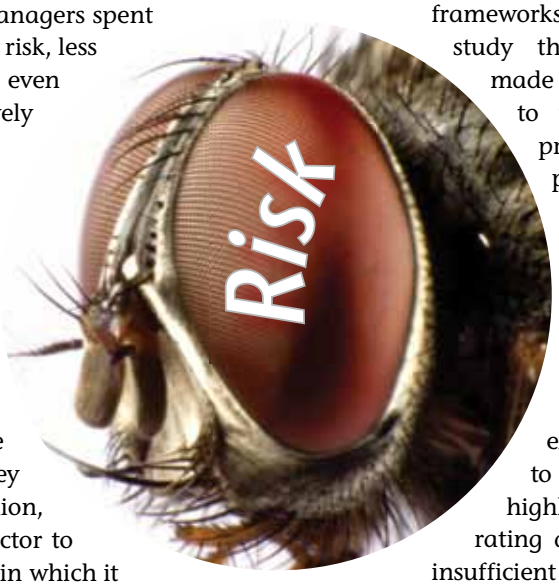
Commodity Risk Management:

Towards a Consistent Approach

Commodity trading companies require a more consistent approach to monitoring, measuring and managing market, credit and operational risks. They can also gain valuable insights from investment banks many of which must tighten up risk management procedures in the wake of recent financial crisis.

By Dr Tony West & Sunilkumar Ramakrishnan

A FLY ON the wall at a commodity trading company might make a few observations about the firm's approach to risk management. It would notice that different types of risk – such as credit or market risk – were often managed by separate departments, and these would also employ differing tools, methodologies and techniques. It would observe that credit and market risk commanded the lion's share of risk managers' time while operational risk was still being largely overlooked. It might also notice that risk managers spent most of their time monitoring risk, less time measuring it, and an even smaller amount of time actively managing it.



Although the scene described above may be fictional, this hypothetical example serves to underline an important point: commodity trading businesses still have a far from consistent and holistic approach to handling the complex, interlocking risks they face. So, in the authors' opinion, the time has come for the sector to take another look at the way in which it manages risk.

Improving Consistency of Risk Management

There a number of compelling reasons for commodity trading companies to improve consistency in their risk management processes. Firstly, companies need to be better prepared to deal with the impact of another investment bank or large energy trading company failing. Secondly, shareholders require the reassurance that businesses understand the risks they face and are sufficiently protected against them. Thirdly, where risks are understood and managed appropriately, access to investment capital is improved. Fourthly, while regulators are focusing on investment banks at present, they are also looking at the commodities markets more closely. New measures have been proposed by the CFTC, including possible position limits on a range of commodity contracts. These and other proposals currently under consultation would create the need for changes to commodity companies' risk management procedures, monitoring processes and potentially even have an impact on their business strategy.

Learning From Banks' Errors

So just how should energy companies go about addressing the gaps in their risk management frameworks? One approach is to study the improvements being made by investment banks to their risk management procedures, following the painful lessons of the financial crisis which have revealed many flaws in the banks' approach. Bankers risk measurements lacked an accurate understanding of exposures and correlation to macro factors and was highly reliant on credit rating agencies. There was also insufficient focus on the stress testing of portfolios, using both historical and forward-looking scenarios.

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In response to the crisis, investment banks have finally started scrutinising their portfolios more carefully, making use of robust, back-tested, independent modelling techniques. As a result, banks are gaining a truer understanding of their risk exposures with more accuracy than before. Greater use of stress testing is being made, including sensitivity

Credit, Market & Operational Risk

Companies require consistent tools and techniques across credit, market and operational risk. They should move beyond the traditional divisions of credit, market and operational risk to gain a better understanding of how these risks overlap, interact and impact the business overall.

tests with risk variables which extend beyond 'normal' moves. Scenario tests – where historical and extreme events are modelled – are used to stress the portfolio. Importantly, financial institutions have realised that reliance on mainly one risk measure, such as VaR (Value at Risk), is insufficient, particularly as the assumptions underlying VaR analysis break down where extreme events are involved. As a result, banks are now looking at VaR analysis in combination with stress test results, "what if" scenario modelling, reverse stress testing – i.e. scenarios that could cause an individual company to fail – and so on.

Market Risk

Although risk managers at commodity trading companies have attained a considerable degree of sophistication in relation to market riks, firms tend to be skilled mostly at monitoring and measuring market risk. Commodity businesses need to adopt a much more dynamic approach towards the management of market risk and efficient utilisation of risk capital.

Firstly, trading companies should identify any risks not captured in their current risk management or VaR framework and include these in the programme list for prioritisation. Having all risks flowing through the VaR framework improves the completeness and quality of risk management, as well as reducing the requirement for manual intervention.

In order to manage market risk more dynamically, energy companies (like banks) should make greater use of stress testing. Stress testing must become a regular part of their risk modelling process and not simply be used as a standalone measure. It should incorporate varying probability weights, so that firms gain a better understanding of the risk range, and include historical scenarios, for example, the oil price crash of 2008, as well as user-defined scenarios. Running sensitivity tests can be useful too, for example, to discover the impact of an event such as a 50% drop in oil prices, breakdown of price correlations etc. In addition, firms could consider the introduction of Black Swan testing, i.e. stressing a portfolio with a risk factor previously ignored or considered to have little likelihood of occurring. Examples could include the Euro losing its currency status or Russian gas supplies to Europe being cut off.

What type of scenarios should commodity and energy companies model? The scenarios chosen should be unique to each company, as firms need to understand what factors are most critical to their own business model. Oil companies could ask themselves what would happen if the crude oil price fell to US$10/bbl, liquidity within the oil market completely dried up or the consequences if oil assets were seized by local governments. For power companies, a comparable scenario might be the discovery of a type-fault in a nuclear power station or the failure of the TSO's control centre. Firms active in the gas markets might wish to understand the effects of a significant trading disruption at a gas hub or the loss of a large storage facility. Importantly, whatever stress scenarios are used, these should be reviewed regularly and adjusted to reflect changes to the company's circumstances.

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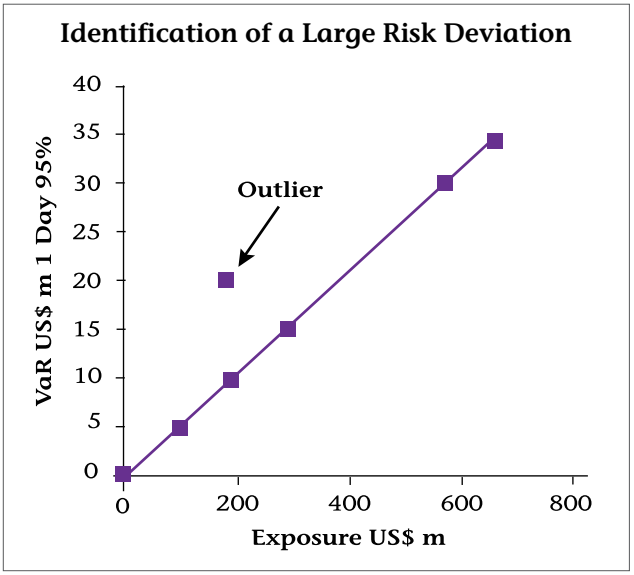
The scenarios outlined above may be thought of as extreme situations but they are worth planning for. Until recently, few would have thought that a cloud of volcanic ash could have caused such disruption and heavy financial losses to the aviation industry. Importantly, stress testing enables businesses to determine their readiness to deal with (increasingly) extreme events. It allows them to understand more accurately the risks they face, to be better prepared and to provide investors with a clearer picture of the risks involved in the business operation.

Finally, regular back-testing should be carried out, ideally on a daily basis. This involves comparing the previous day's actual P&L with daily VaR numbers. This is important from a regulatory

point of view and also essential to ensure management confidence in risk management processes. Steps should be taken to ensure that the number of exceptions – losses larger than estimated by the VaR model in frequency and size – are understood and corrective actions incorporated into the risk management model. Back-testing of expected tail loss can also provide an indication of how well the model captures the size of expected loss beyond the traditional 95% or 99% VaR confidence levels.



Credit Risk

Traditionally, while credit risk has always been an important consideration, the main focus within commodity trading companies has been monitoring of counterparty credit risk and limiting counterparty exposure by applying credit lines – the credit risk managers' primary responsibility has been to make certain that trading remains within these limits. Most of the initiatives taken to improve efficiency in this area have been aimed at optimising this credit risk monitoring process. While firms are skilled at monitoring credit risk, they still need to improve the way credit risk is measured and adopt a more active approach to its management.

Turning first to the measurement of credit risk, many energy trading businesses only measure credit risk as *current* exposure. They should, in fact, give more attention to potential *future* exposure (PFE), which is more consistent with the measures used for market risk. Firms should also be aware that developments have occurred in the way PFE is measured, with more sophisticated organisations using Monte Carlo and variance/co-variance techniques. Businesses need to make use of what is appropriate to their needs – avoiding over-engineering and selecting techniques that fit the firm's activities.

Importantly, commodity trading companies need to manage credit risk more actively. Firms should invest in capabilities which allow managers to drill down into risk results, in real-time. These capabilities aid firms to gain an understanding both of the contributors to risk and provide an insight into where it is concentrated. They also enable companies to identify positions or trades which place a counterparty significantly outside the normally acceptable limits of risk. Such credit exposures can then be hedged by trading credit default swaps, thereby also realising value from price arbitrage between the various counterparty credit spreads, an approach often used by investment banks.

On a daily basis, a company needs to identify deviations from its approved risk distributions policy by identifying high risk counterparties so as to manage marginal credit risk actively. It could reduce risk by going long credit default swaps against the high risk counterparty and possibly bring VaR to consistently lower levels, without having to lose out on the benefits of dealing with 'higher risk' market participants. The company could also choose to bring the VaR back in line using other routes, for example, through the use of central clearing, netting, identifying a natural hedge, by asking for additional collateral or even exchange trading.

Clearly, there are a number of possible avenues the company can take. However, the essential point is that the company is actively managing VaR from an informed position – an approach which is largely lacking at present.

In order to manage credit risk even more efficiently, commodity trading companies also need to rethink their attitude towards collateral. At present, collateral tends to be viewed by most energy firms as static data. For example, a company sells crude oil to another market participant, which has posted US$10m collateral. The first company views this collateral value as a credit risk offset but ignores the fact that the value of the collateral changes as the market moves. If the market moves adversely, not only does the collateral value potentially fall, but the exposure to the market participant increases, creating an even greater degree of credit risk. This is an important aspect and one which needs to be considered more carefully by energy companies.

> Operational risk management is, generally speaking, in an immature state at most commodity trading companies

In addition, commodity trading companies must ensure that changes to counterparty exposure due to macroeconomic factors are understood and modelled better. Systems and procedures should be upgraded so that the volatility in the collateral and macro impacts can be measured, monitored and managed. This will ensure that the correct off-set to credit risk exposure is used in

credit risk calculations.

Finally, as in the case of market risk, commodity trading companies can improve the efficiency of their credit risk management processes by; firstly capturing any risks not already included in their current risk management frameworks; and secondly, through back-testing.

Liquidity Risk

Trading liquidity risk (an area which overlaps with market and credit risk) is another field in which companies should consider introducing a more consistent approach to monitoring, measuring and managing risk. If liquidity falls when an energy trading company is carrying out a transaction, and the company buying cannot unwind or hedge the position fast enough, liquidity risk is created. Investment banks actively manage trading liquidity risk by monitoring the market bid-ask spreads and build this into their market making and pricing models. Energy companies need to consider this aspect and build a charge into their pricing models, both to avoid falling into a liquidity trap and to manage trading liquidity risk more efficiently.

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Operational Risk

Operational risk management is, generally speaking, in an immature state at most commodity trading companies: businesses tend not to have dedicated operations risk managers, nor is operational risk understood to a sufficient level. Companies are only now beginning to monitor trading operational risk, while its measurement is still in its infancy. Indeed, the industry is only just becoming aware of the need to use benchmarks or metrics to measure and understand operational risk. As with other types of risk, there can be no proper management if companies have no adequate means of monitoring and measuring it.

One example of particular weakness is trade confirmation. The process is riddled with delays and, even at large companies, can take up to a few weeks, depending on the complexity of the transaction and issues encountered in the contract terms and so forth. If a counterparty fails in the intervening time, the impact is likely to be significant and may involve hardship.

In contrast, a number of investment banks are now able to process confirmations quite rapidly. Commodity companies should aim to emulate financial institutions in this respect – measuring confirmation times against industry benchmarks, both to improve efficiency and to reduce the risk of being unable legally to enforce an unconfirmed trade, in the event of counterparty bankruptcy. An understanding of the potential financial impact might focus attention.

Invoicing constitutes another problem area. Here, similar delays can occur to those encountered in the confirmation process, with complex pricing terms and delivery quality issues often being the root cause of the delay. Again, commodity businesses would do well to put in place metrics to measure and monitor operational processes such as invoice generation. This, in turn, would allow firms to identify weak spots and to take remedial action.

Finally, for firms operating in the physical commodities arena, other types of operational risk need to be considered. In particular, businesses need to assess the efficiency with which physical assets operate. In this respect, metrics aimed at measuring the commercial availability of an asset can also play an important role. Indeed, some large energy firms already make use of these metrics. For businesses that do not yet carry out these assessments, forming partnerships with agencies which undertake benchmarking exercises of operational processes will prove beneficial.

Conclusion

Individual commodity trading companies have attained differing levels of sophistication in relation to the monitoring, measuring and managing of market, credit and operational risk. Nevertheless, in the authors' experience, the bulk of firms should consider taking a far more consistent and holistic approach to risk management. In particular, companies must abandon old attitudes which view market, credit and operational risk as separate heads and operational risk as the 'poor relative' of the other two. In contrast, firms need to establish where the risks overlap in their businesses and quantify these interactions in a consistent manner. Companies must become more sophisticated in the measurement of risk, as well as active in its management. Finally, businesses should ensure that similar types of tools and techniques are employed, across all types of risk, in order to ensure its consistent management and help provide a more enterprise-wide view of risk. •

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