

A photograph of a warehouse interior. In the foreground, a red and black pallet jack is positioned on a wooden pallet. The pallet is loaded with several large, brown cardboard boxes. Some boxes are stacked on top of others. The background shows rows of more cardboard boxes stacked on pallets, extending into the distance. The lighting is somewhat dim, typical of a warehouse.

OLIVER WYMAN

Global Risk Center

In Practice Guide:

Managing Counterparty Risk in the Supply Chain




Association for
Financial Professionals®

About this Report

This report and the associated workbook provides guidance for companies in developing an in-house counterparty credit risk assessment model that incorporates operational, financial and subjective factors. In addition, the material provides recommendations for companies that would like to enhance the effectiveness of their current risk assessment capability.

A supporting workbook is available by clicking on the pushpin icon. 

This guide is a companion piece to “*The New Weakest Link in Your Supply Chain: Supplier Credit Why Companies Need to Behave More Like Their Own Credit Rating Agencies*” published by the Association for Financial Professionals (AFP) and Oliver Wyman in November 2010. The article is available by clicking on the pushpin icon. 

Introduction

Over the past 10-15 years, globalization has forced companies in all sectors to compete ever more fiercely in terms of operational leanness as well as quality of product and service. As a result, supply chain management has become a fine art as companies integrate information and processes, improve supplier performance, and cut inventory and working capital.

Increased supply chain interconnections have escalated three things: the risk of disruption, the cost of disruption and, by extension, the cost of risk management or transfer. In this context, supply chain failures have a price tag that goes far beyond the direct cost of business disruption. The reputational damage caused by delayed delivery, unfulfilled orders or product withdrawals often affects future revenue streams and profitability as customers and trading partners take their business elsewhere. In a world of global markets, supply chain management is on a par with brand, people and product management.

The financial crisis, its ensuing recession, and the increased number of bankruptcies have pushed many companies to re-evaluate the strength and resilience of their supply chain. However, hard decisions in evaluating suppliers and managing supply chains are exacerbated by the fact that the individual pieces are usually managed in silos. This makes it difficult to assess the trade-offs between risk prevention and transfer in relation to profit or cash flow targets.

It is challenging to strike the right balance between risk and return in competing tenders to account for the likelihood of financial default or delivery failure. Far too often the costs of dealing with an inexperienced or financially weak supplier are underestimated.

In this context, it is critical to have a framework for identifying both the physical and financial vulnerabilities of the supply chain. The frameworks should be supported by customized counterparty credit risk and loss distribution models to detect potential financial risks. The models apply statistical methods to determine the combination of operational, financial and more subjective factors (for example, the track record of the supplier’s management team) to indicate potential supplier defaults and break-downs in the supply chain. The treasury group can take a lead role in developing such a framework for the organization. Working in collaboration with other functions, the treasury can lead the examination of supplier profiles to protect the company and help manage cash flow and payments.

Customized models used to evaluate the counterparty risk associated with suppliers are similar to the models used by banks and rating agencies in evaluating the credit risk on loans or bond issues. As such, the probability of default represents a critical input to counterparty credit risk and loss distribution models. However, evaluating the creditworthiness of suppliers requires information and analyses that are distinctly different from those utilized by rating agencies as illustrated below.

Exhibit 1: Counterparty Credit Evaluation Needs Compared to Rating Agency Information

	Counterparty Credit Evaluation Needs	Rating Agency Information
Probability of Default Information	Absolute probability of default information to calculate absolute cost impacts	Provides relative credit rating information
	Incorporation of systemic risk into creditworthiness evaluation	Demonstrated inability to forecast systemic risk
Timing	Short term accuracy of ratings (60-100 days)	Uses through-the-cycle methodology, for a long-term view of default risk
	Early warning information	Slow to downgrade to avoid procyclical effects and erosion of reputation
	Indication of default probability over defined time horizon	Indicates risk over multiple horizons, rather than a single, defined horizon
Confidence	Full understanding and confidence in the ratings methodology	Investigations have revealed material weaknesses in agency methodologies

Source: Oliver Wyman

Overall, agency ratings have significant limitations in supporting supplier creditworthiness monitoring. As a result, companies are increasingly developing their own internal credit rating capabilities. Predictive analytics and customized rating tools are crucial to developing a more realistic picture and plan of action to anticipate, manage and where possible avoid supplier defaults.

Best practice risk rating tools incorporate both financial and qualitative factors. However, developing an effective model is challenging due to the size and complexity of global supply chains including an increase in offshore outsourcing and a growing number of unrated suppliers, often in low cost countries, with less reliable financial data.

The Scale of the Challenge

Oliver Wyman recently assisted a global manufacturer assess its supply chain risks and associated drivers including supplier default. The analysis framework had to encompass:

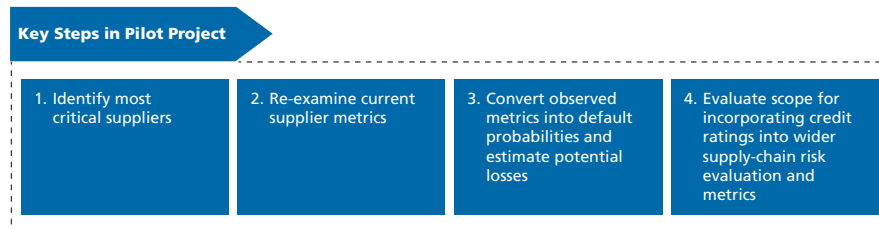
- Over 1000 suppliers in the global supply base
- Many suppliers were unlisted/unrated entities that deliver to a large proportion of the production and hence revenue generation
- Large number of single source suppliers existed
- Many-to-many relationship between suppliers and internal products
- Both physical and financial supplier risks needed to be considered
- Default correlations also had to be considered – coincidence of defaults by multiple counter-parties in the portfolio, driven by common business risk factors (e.g. geography, industry, business model)

Getting Started with a Pilot

There are many factors to consider in developing a counterparty credit risk and loss distribution model. Given the scale of modern supply chains and the difficulties in developing metrics and assigning proper weighting, it has proven beneficial to start with a pilot project with a sub-section of suppliers.

The pilot can help to validate the metrics, the weightings and the model. The result of the initial analysis can also be used to develop internal support for a revised supply chain risk assessment approach and application of the model to the broader supplier portfolio.

Exhibit 2: Pilot Project for a Counterparty Credit Risk Model: Key Steps



Source: Oliver Wyman

Step 1: Identify Most Critical Suppliers

Key decision: Selecting filter to determine critical suppliers

Key output: A sub-set of supplier portfolio to assess

The first step is to select a sub-set of suppliers for the pilot project. Many companies may consider suppliers with which the company has the highest annual purchasing spend as part of the initial sub-group. However, high dollar spend is not always the best indicator of supplier risk. It may be more effective to select the sub-group based on whether the company has faced supplier performance problems, or based on the uniqueness of the input, or where the company relies on single sourcing or few suppliers.

The treasury group should work closely with other functions to determine the key filters in selecting the group of suppliers for the initial assessment. Functions such as sales/marketing, procurement and key operational or project managers can help consider other factors such as:

- Potential impact of loss of supplier on company's ability to complete key projects or produce goods
- Difficulty to replace a supplier if company defaults
- Time and cost required to replace a key supplier and the impact on corporate cash flow during this search (increased costs, reduced revenue)
- Customer reaction to delays, quality changes, or temporary stock outs

Based on this multi-filtered approach, approximately 10-15 suppliers can be selected for the pilot analysis.

Step 2: Re-Examine Current Supplier Metrics

Key decision: Selecting supplier metrics and data sources

Key output: 5-12 qualitative and quantitative supplier metrics

In parallel with selecting the suppliers to include in the initial analysis, the company can begin to develop supplier metrics that will form the base of the credit risk analysis. Both quantitative and qualitative metrics are essential, as qualitative metrics can indicate latent problems that may not surface with solely quantitative indicators. There are two primary inter-related challenges associated with supplier metrics: selecting the effective metrics; and secondly, determining the information source for metrics.

Selecting Quantitative and Qualitative Metrics

Typical credit models will utilize 5-12 quantitative factors and a similar number of qualitative metrics. Individual circumstances will dictate the final structure, but the most important issue is to identify measures with good explanatory power, and to calibrate the resulting model appropriately. Samples of quantitative and qualitative metrics are shown below.

Examples of Supplier Metrics

Quantitative Metrics	Qualitative Metrics
Total assets	Changes in terms of credit
Net income/assets	Delayed or incomplete order fulfillment
Net income growth	Negative press coverage
Interest coverage ratio	History of relationship
Cash/assets	Quality of balance sheet
Sales growth	Business model
Liabilities/assets	Management turnover
Retained earnings/assets	Timeliness of reporting

Information Sources for Metrics

Information sources for both quantitative and qualitative metrics can be internal and external to the organization.

A key consideration is the completeness of the data across multiple suppliers and also the stability and frequency of the data source. Put differently, can the data source provide consistent data repeatedly in the necessary time frames and frequency (monthly, quarterly, annually, etc.)?

The data source and consistency challenge is particularly difficult with the increased geographical and organizational distance in many global supply chains. Many companies have developed a greater reliance on suppliers in low-cost countries that are unfamiliar to senior management and where critical components are sourced through a limited supplier panel. In most cases the track record of business partners is limited, and accurate data on their financial strength is not readily available.

In this instance, companies can turn to sources such as local business associations, trade groups, better business bureaus and the like.

Examples of Information Sources

Quantitative Metrics	Qualitative Metrics
Credit ratings (where available)	Sales team insights/industry networks/project managers, etc.
Internet searches/ public information searches	Internet searches/public information searches
Accounts Receivables/Payables – especially where have reciprocal supplier/vendor relationship	Supplier documents
Supplier site visits	Quality of balance sheet
	Supplier interviews or questionnaires

Factoring in Other “Red Flags”

Many qualitative indicators can serve as “red flags” suggesting a supplier’s developing financial problems. Some of these can be captured in a model (e.g. changes in terms of credit or changes in payment terms (shortening/ lengthening). Others cannot be easily captured but are important to consider. Roundtables convened by the AFP and Oliver Wyman with treasurers in New York and Chicago noted that the following issues should be monitored:

- Offers of changes in payment terms, e.g. pre-payments
- Request to make payments in different currency
- Changes in banks
- Delays in returning calls/decreasing communications
- Delays in payments
- Reducing inventory

A regular, ongoing dialogue with a cross-functional team focused on the strength and risk-resilience of the supply chain can help the company identify and monitor these red flags.

3. Convert Observed Metrics into Default Probabilities and Estimate Potential Losses

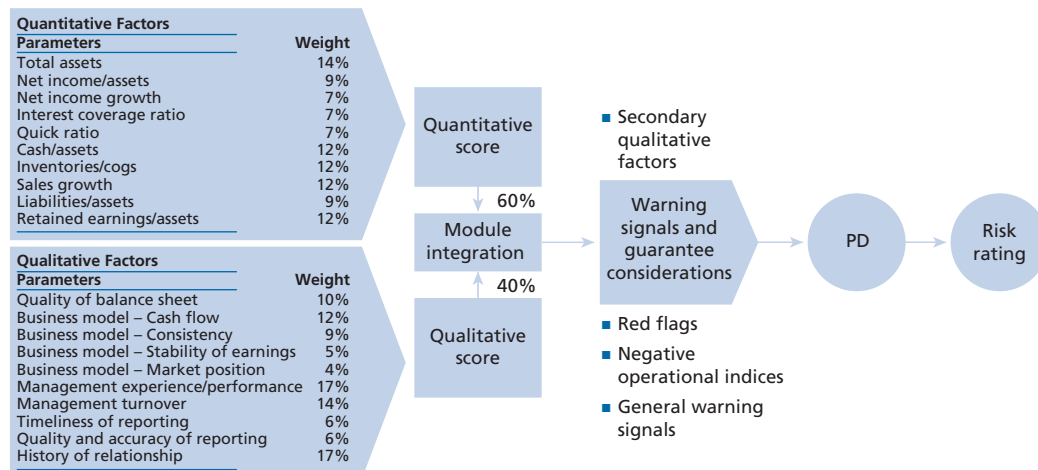
Key decision: Selecting weightings

Key output: Rating and loss estimates

The set of chosen metrics is then used to determine the calculation of default probabilities and the estimate of potential losses should the supplier default.

Exhibit 3: Estimating Default Probabilities

Supplier Credit Rating Tool – Illustrative



Source: Oliver Wyman

The calculation of default probabilities is normally a deceptively simple process – in that the mathematics of the process is relatively simple. The primary challenge is selecting the indicator and determining weightings. Prior to the calculation, each indicator’s range of responses is “bucketed” on a standard scale so that the factors can be combined in a meaningful way. Indicator weightings are also established to properly balance the impact of each factor on the overall credit rating. The process of constructing and calibrating the scoring model focuses on adjusting these buckets and weights in such a way that the resulting scoring model is highly effective.

Ideally, a substantial history of firm performance can be used to provide statistical underpinning of this process. Where historical data is not available, approximate “broad brush” indicators may need to be used based on general rules. For example, where data is not possible, the supplier may be rated at BBB- as a default. Alternatively, average defaults for that category of suppliers can be used.

A simple model with sample indicators and weightings can be found at...[LINK]. The structure of an internal credit scoring model is shown on the tab labeled “Scoring Model Structure”. This example uses only six factors, three quantitative and three qualitative, for expository purposes but makes very explicit how the bucketing and weighting function to produce an internal credit score. In an actual pilot model, one would expect to see numerous factors and weights as shown in Exhibit 3.

After generating internal default probabilities (or using the default probabilities associated with the agency rating for externally rated suppliers) the next step is to estimate the impact of a default. These two results can then be combined to examine potential annual losses or loss distributions for the firm. Default impacts must consider a number of critical issues that are unique to each firm’s supply chain. For each supplier these would include:

Default Impact Factors:

- Annual spend
- Frequency of ordering and invoicing
- Payment terms allowed
- Inventory of material on hand
- Inventory of finished goods
- Time required to replace the supplier
- Cost increase incurred in replacing the supplier
- Customer impacts of a stockout

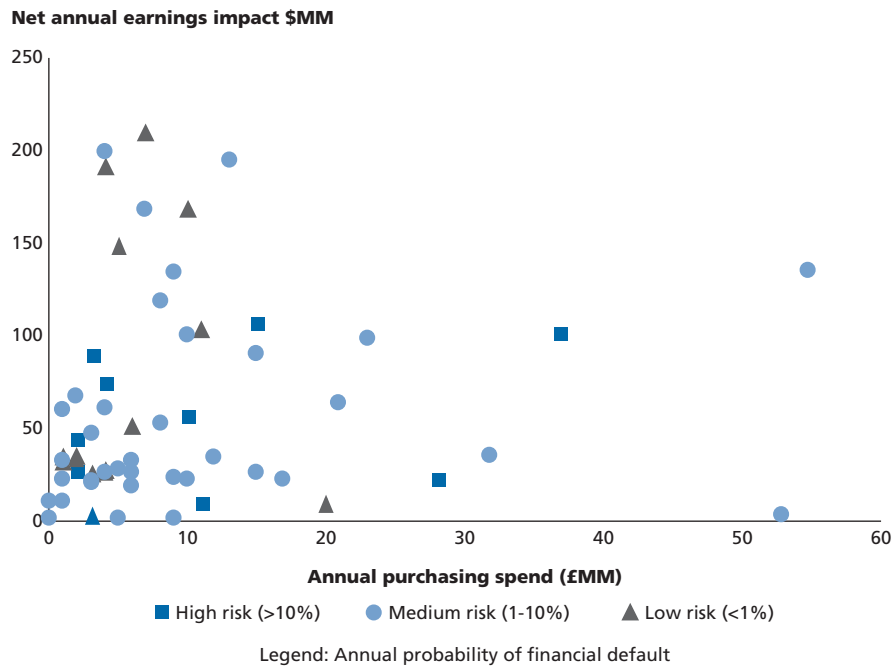
A second workbook tab, (“Impact and Loss Likelihood”) in the sample spread sheet shows how the default impact could be estimated. Although this example calculation is at a fairly high level, it could be used to compare the relative risk associated with two or more suppliers.

Interpreting and Presenting the Results

The analysis of estimated losses provides insights on the impact of potential supplier default on the organization, including the levels of potential cost or loss, and their likelihoods. This in turn helps management determine and quantify their risk tolerances (the level of supplier credit risk that the company can willingly bear).

The results of the analysis can be presented to management in various formats such as a supply-chain risk “heat map” illustrated below.

Exhibit 4: Supplier Credit Risk Portfolio – Illustrative



Source: Oliver Wyman

4. Evaluate Scope for Incorporating Credit Ratings into Wider Supply-Chain Risk Evaluation and Metrics

Key decision: Define scope of supply chain analysis
Key output: Supply chain risk management strategy

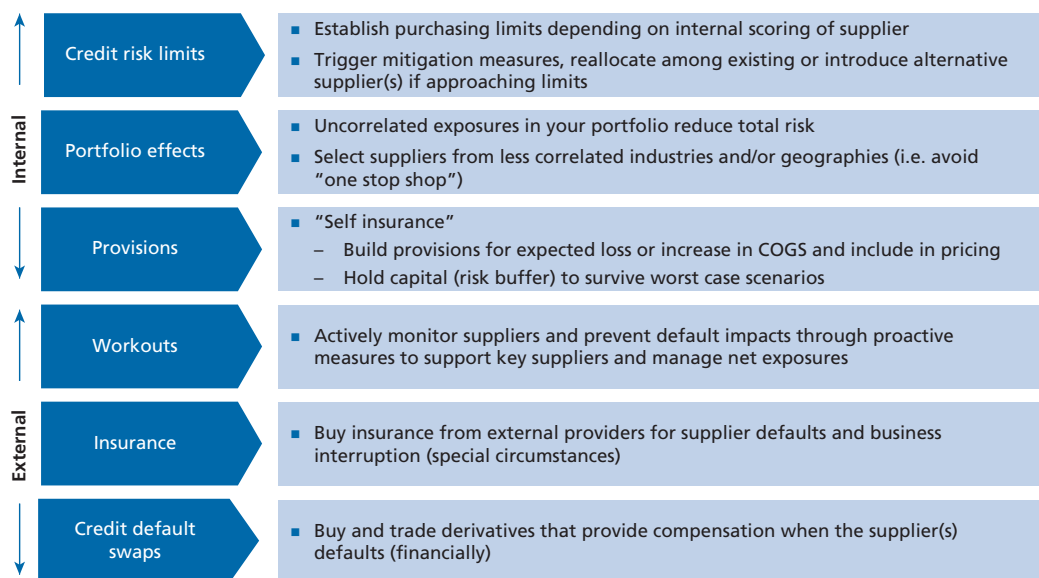
Drawing on the analysis, the company can develop improved risk oversight and monitoring of existing suppliers including using the credit ratings to inform audit programs.

Building and Maintaining a Supplier Database

Having determined the key supplier metrics and data sources for these, the company should incorporate this into their supplier database or create one if required. The supplier database should be kept up to date using both external research/supplier information gathering as well as information from regular supplier interactions (e.g. supplier visits, audits etc). The population of the supplier database will ensure that the firm develops better data to do time-series analysis on key metrics to feed the loss prediction models.

Companies may also decide to initiate one or more credit risk management options. Each of these needs to be evaluated from a cost-benefit perspective.

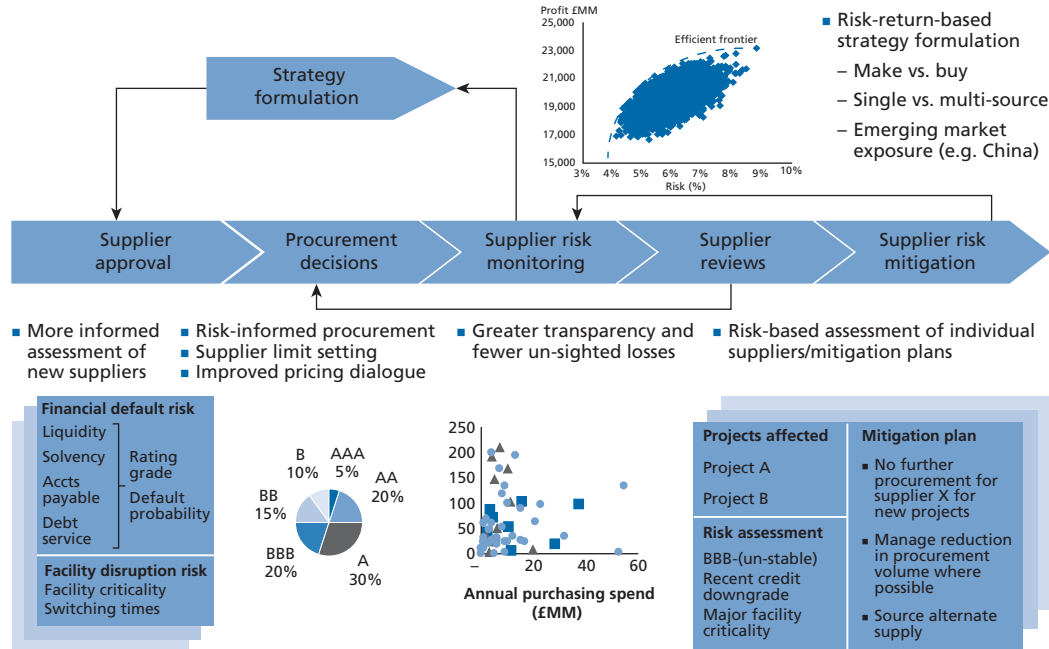
Exhibit 5: Counterparty Credit Risk Management Options



Source: Oliver Wyman

Based on the initial pilot, the company can consider the value and effectiveness of integrating credit ratings into their broader supply chain risk evaluation. Enhanced counterparty credit analysis is one aspect of an overall risk-based approach to analyse supply-chains and proactively managing supplier risks and strategies. This approach supports all decision-making relating to supply-chain optimization and supply-chain strategy development.

Exhibit 6: Supply Chain Risk Management is Key to Supply Chain Optimization



Source: Oliver Wyman

Benefits

The approach described in this In Practice Guide provides a methodology and platform for enhancing the use of internal supplier intelligence along with external metrics to enable forward-looking supplier risk management. There are many benefits in adopting this approach, including:

- ✓ Awareness of decreasing credit quality amongst suppliers
- ✓ Develop forward-looking supplier risk analysis that can anticipate supplier problems
- ✓ Recognition that supply-chain risk management can support better supply-chain strategy formulation
- ✓ Management tool for measuring and tracking the development of risks in the supply-chain
- ✓ Greater awareness of the total level of risk in the corporate supply-chain
- ✓ Framework for assessing supply-chain risks that can be applied within individual projects, not just at the corporate level
- ✓ New inputs into the supply-chain strategy formulation process
- ✓ Enhanced dialogue with senior stakeholders regarding the size and nature of supply-chain risks faced
- ✓ Ultimately leading to fewer unsighted supply-chain issues going forward

Oliver Wyman and the Association for Financial Professionals —The Financial Insights Series

This is part of series of papers by international management consulting firm Oliver Wyman and the Association for Financial Professionals that address critical issues for finance professionals.

Oliver Wyman and AFP welcome your thoughts on the ideas presented in this paper. If you would like to provide feedback, or be alerted when we schedule events or other activities for corporate finance professionals, please contact one of the individuals listed below.

Oliver Wyman is an international management consulting firm that combines deep industry knowledge with specialized expertise in strategy, operations, risk management, organizational transformation, and leadership development. Its corporate risk practice works closely with leading organizations to effectively manage risk, enabling them to make risk-adjusted strategy, investment, and capital allocation decisions that improve performance and optimize value creation.

The Association for Financial Professionals (AFP), headquartered outside Washington, D.C., serves a network of more than 16,000 members with news, economic research and data, treasury certification programs, networking events, financial analytical tools, training, and public policy representation to legislators and regulators. AFP is the daily resource for the finance profession.

Copyright © 2011 Oliver Wyman. All rights reserved. This report may not be reproduced or redistributed, in whole or in part, without the written permission of Oliver Wyman and Oliver Wyman accepts no liability whatsoever for the actions of third parties in this respect.

The information and opinions in this report were prepared by Oliver Wyman.

This report is not a substitute for tailored professional advice on how a specific financial institution should execute its strategy. This report is not investment advice and should not be relied on for such advice or as a substitute for consultation with professional accountants, tax, legal or financial advisers.

Oliver Wyman has made every effort to use reliable, up-to-date and comprehensive information and analysis, but all information is provided without warranty of any kind, express or implied. Oliver Wyman disclaims any responsibility to update the information or conclusions in this report. Oliver Wyman accepts no liability for any loss arising from any action taken or refrained from as a result of information contained in this report or any reports or sources of information referred to herein, or for any consequential, special or similar damages even if advised of the possibility of such damages.

This report may not be sold without the written consent of Oliver Wyman.

Oliver Wyman is an international management consulting firm that combines deep industry knowledge with specialized expertise in strategy, operations, risk management, organizational transformation, and leadership development.

The Association for Financial Professionals (AFP), headquartered outside Washington, D.C., serves a network of more than 16,000 members with news, economic research and data, treasury certification programs, networking events, financial analytical tools, training, and public policy representation to legislators and regulators. AFP is the daily resource for the finance profession.

For more information, please contact:



Michael J. Denton, Partner, Corporate Risk, Oliver Wyman
+1.646.364.8423, michael.denton@oliverwyman.com

Michael J. Denton, PhD, is a New York based Partner in Oliver Wyman's Corporate Risk practice, with specialized experience in energy, agriculture, and the commodities risk and trading sector. As a practitioner and as a consultant, he has worked extensively in market risk modeling, portfolio dynamics, and risk-based decision frameworks. Recent projects have focused on due diligence evaluations, competitive contracting, and counterparty credit risk mitigation.



Brian T. Kalish, Director, Finance Practice Lead
+1.301.961.6564, bkalish@afponline.org

Brian T. Kalish is the Director and Finance Practice Lead of The Association of Financial Professionals. He is responsible for the Finance Practice which includes Corporate Finance, Risk Management, Capital Markets, Investor Relations, Financial Planning & Analysis, Accounting and Financial Reporting. He joined AFP in 2008.

www.oliverwyman.com

Copyright © Oliver Wyman. All rights reserved.