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Global Risk Center

IN PRACTICE GUIDE

SIX STEPS TO ASSESS COMMODITY RISK EXPOSURE

MARSH & McLENNAN COMPANIES

ABOUT THIS REPORT

This report and the associated workbook provide guidance for companies to better understand and quantify the impact of commodity risks on earnings in order to improve an organization's commodity risk management.

The supporting excel workbook is available by clicking on the pushpin icon. This guide is a companion piece to *"Volatility not Vulnerability"* published by the Association for Financial Professionals (AFP) and Oliver Wyman in October 2011. The article is available by clicking on the pushpin icon or can be found online at www.oliverwyman.com.

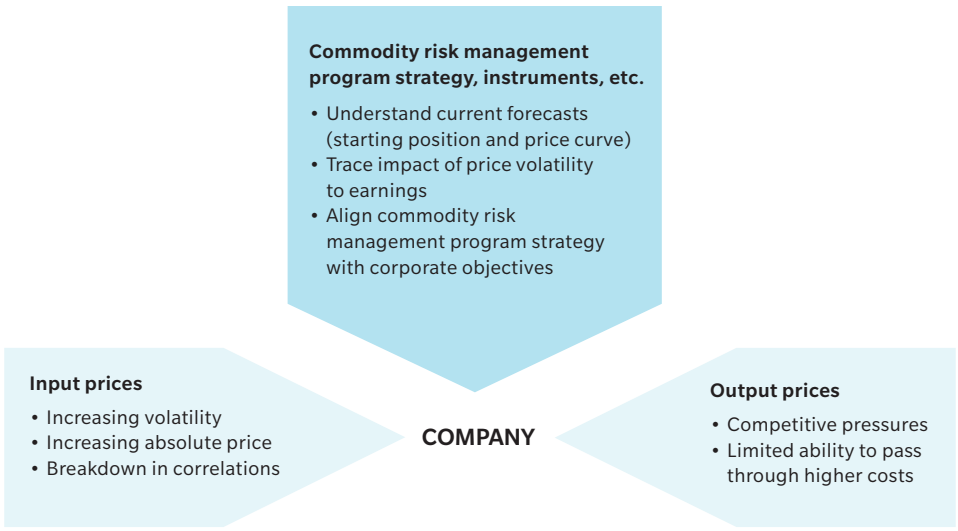
CORPORATE CHALLENGES IN MANAGING COMMODITY RISK

- Developing management strategies (pricing, procurement and hedging) using a holistic risk-return perspective instead of just heuristics to make decisions
- Evaluating portfolios of potential mitigation strategies which have impact on internal diversification and aggregation in adequate depth
- Automating the aggregation and integration of a wide range of data and assumptions (e.g., purchasing contracts, commodity forecasts, ability to pass-through)
- Applying sufficient tools to engage suppliers on contract terms using a risk-return perspective and to develop innovative structures that are mutually beneficial
- Engaging champions and senior sponsors who are passionate about implementing long-term risk mitigation strategies such as revised contract structures or pricing changes
- Treating commodity price risk management as a "margin stabilization" process rather than a "cost."

INTRODUCTION

Given the current and future trends in commodity prices and volatility, every company must better understand its true commodity exposure. Companies can often be squeezed by rising and volatile commodity input prices that cannot be passed along to customers in their entirety. A commodity risk management program can help. Not all organizations can, or should, adopt the sophisticated mechanisms of a pure commodity business. However, most organizations, particularly those in the middle of the value chain, can improve their commodity risk analytics.

EXHIBIT 1: COMPANIES ARE CHALLENGED BY RISING COMMODITY VOLATILITY



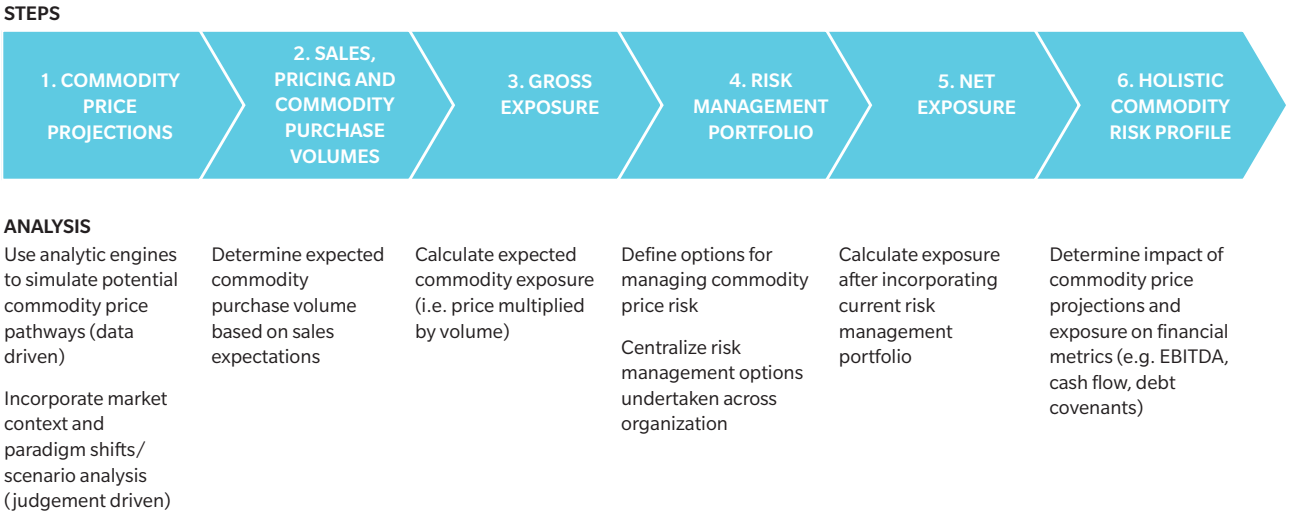
The starting point is to understand the company's holistic commodity risk profile using analytics and modeling tools. A holistic commodity risk profile helps the organization assess its individual and net exposure to commodity prices—and the inevitable volatility—across business and customer segments on a forward-looking basis. The profile provides a common understanding for senior management and a "fact-based" foundation for evaluating the effectiveness of current risk-mitigation actions and alternative risk management strategies.

With this knowledge, management teams can determine if current commodity risk exposure is within the company's risk tolerance and communicate these expectations to stakeholders. It also helps to promote risk mitigation at the portfolio level by identifying the most important drivers of overall risk and ensuring the capture of any offsetting risks that may be present. In short, this analysis will allow the company to optimize risk-return positioning. This *In Practice Guide* provides an overview of a stepwise approach and analytic processes necessary to develop an organization's net commodity exposure.

SIX STEPS TO DETERMINING COMMODITY EXPOSURE AND IMPACTS

Exhibit 2 provides an overview of a six-step analytical approach to determine the impact of commodity price risks on key financial metrics.

EXHIBIT 2: SIX STEPS TO CREATE A HOLISTIC COMMODITY RISK PROFILE



STEP 1: COMMODITY PRICE PROJECTIONS

CORE ANALYSIS	User-defined, baseline commodity prices and volatilities for a predefined set of commodity inputs are incorporated into a standard simulation process to generate a distribution of potential future price paths for each commodity
OUTPUTS	A distribution of terminal price values for each commodity and time horizon
BENEFITS	• Integrates historical patterns, market intelligence and fundamental analysis • Unifies views of commodity price scenarios across the organization • Incorporates interrelationships and correlations between commodities and other price risk factors (e.g., currencies)

The first step in the analytical framework requires management to build assumptions for commodity prices in the future using simulation or other techniques. The management team should complement these forecasts with an analysis of alternative price outcomes, based on "stress events," to understand fully how prices may evolve.

A simple price simulation model is presented in the attached workbook (accessed through the pushpin icon). The inputs for these simulations are located on the tab labeled "Interface" under the heading "Price and volatility." The user defines base case prices and volatilities for each commodity and forward period (i.e., 1st quarter, 2nd quarter and so on). The simulated terminal value prices or outcomes for each commodity and time horizon are shown on the tab labeled "Cmdy Price Proj." Each of these values reflects possible future outcomes for commodity prices based on three factors: mean price, volatility and time.

The outputs of the simulations for each commodity are summarized on the "Interface" page in the "Commodity price projections" section. In each case, 5th and 95th percentile outcomes are shown along with the baseline price scenario over the course of the time period to provide a richer understanding of possible outcomes versus a single, static forecast. Not surprisingly, the uncertainty of price forecasts grows with the increasing time horizon.

STEP 2: SALES PRICING AND PURCHASING VOLUMES

CORE ANALYSIS	User-defined commodity volumes for the predefined set of commodities are coupled with the distribution of price outcomes to support the determination of gross and net exposures to commodities. Sales volumes and prices are incorporated into the pro forma financial statement to understand earnings impacts from commodity exposures.
OUTPUTS	A predefined set of commodity volumes reflecting commodity demand over time
BENEFITS	• Centralizes commodity requirements across business units and geographies • Enables testing of alternative commodity purchase requirements using price elasticity analysis

In the second step, the management team must estimate the volume of future commodity purchases across the enterprise. The estimated volumes for inputs are going to be directly linked to sales forecasts and thus may be derived from product demand profiles. While the current model focuses on price uncertainty, it is important to recognize the presence of volume uncertainty as well. The static volumes are estimated and then entered by the user on the tab labeled "Interface" under the heading "Commodity volumes."

Assumptions for product sales volumes and prices are also entered on the "Interface" tab for later use in the holistic commodity risk profile assessment.

STEP 3: GROSS EXPOSURE

CORE ANALYSIS	User-defined baseline prices are combined with simulated price paths and volumes to generate commodity exposure as measured by the difference between the 95th percentile worst case outcome and the baseline, expected outcome
OUTPUTS	A firm's gross commodity exposure given commodity price and volume
BENEFITS	• Gives context of expected commodity exposure in comparison to P&L and other risks • Shows changes over time due to either changes in business mix or changes in commodity price expectations

In the third step, the expected gross commodity exposure is determined. The 95th percentile worst case commodity costs, located on the tab labeled, "Gross Exposure," are found by multiplying each commodity volume by price. Gross Exposure is determined by summing the difference between the baseline cost and the simulated, 95th percentile worst case cost for each individual commodity exposure. Alternative percentiles may be selected using the "Exposure risk level" input value on the "Interface" tab.

STEP 4: RISK MANAGEMENT PORTFOLIO

CORE ANALYSIS	Risk management strategies currently in place are identified
OUTPUTS	Portfolio of existing risk management options (e.g., a set of commodity derivative hedges)
BENEFITS	• Brings together and coordinates different functions of the organization (i.e., Strategy, Sales and Marketing, Procurement, Treasury) and geographies • Sets common understanding of risk management options for key commodity exposures

After determining gross commodity exposure, the next step in the process is to identify existing risk management strategies. The tab labeled, "Risk Mgmt Portfolio," has a predefined list of risk management options available which limit the management decision to financial hedges that are assumed to lock-in the commodity at the baseline, expected price. On the tab labeled "Interface" under the heading "Hedge Selection," the user selects "yes" or "no" for each commodity depending on whether the firm plans to hedge that particular commodity. It is important to note that management of commodity price risk is not limited only to financial hedging; rather, it typically involves a combination of four broad levers – each (or a combination thereof) may be effective as illustrated in Exhibit 3.

Besides recognizing current risk management strategies, this step also alerts management of other potential risk mitigation options that may be available to manage key commodities exposures.

EXHIBIT 3: RISK MANAGEMENT OPTIONS

	A. PRODUCT PRICING (INCL. "PASS-THROUGH")	B. PROCUREMENT CONTRACTS	C. FINANCIAL HEDGING	D. VALUE CHAIN INTEGRATION, LONG-TERM STRATEGIES
OVERVIEW	• Use market pricing power to recover change in input costs – revenue management	• Balance/share/transfer risk on purchases – cost management	• Transfer risk to third party through markets/ structured deals (Reinsurers also providing capacity here)	• Up or downstream integration e.g., sourcing raw materials, retail, trading
EXAMPLE STRATEGIES	• Employ cost pass-through mechanisms (across all or a portion of the product portfolio) • Align price risk transfer mechanisms with sales and purchase contracts	• Include contract mechanisms that mitigate risk (e.g. price ceilings/ floors, price bands, knock-in/knock-out clauses)	• Hedge price exposure with swaps to set the price or options or collars to limit downside • Cross-hedge exposure with contracts with strong correlation to underlying exposure	• Acquire upstream company to ensure supply and diversify risk exposure • Identify drivers that contribute greatest percentage to overall risk
PROS	• Raw materials costs fully or partially passed through to customers • Stabilized margins and earnings certainty	• Protection against price moves and volatility • Transition risk back to supplier under certain structures	• Protection against feed stock price moves and volatility • No impact on product pricing/supplier contracts	• Holistic approach to cost and margin management • Diversification of risk exposure
CONS	• Customers may substitute products or move to lower priced competitor brands in response to product price	• Suppliers demand premium (higher price) for risk sharing • Need to find receptive suppliers	• Liquidity premium and market non-availability for many commodities • Basis risk from cross-hedging	• Requires appropriate capital and expertise for joint ventures or acquisitions • Increased organizational complexity

STEP 5: NET EXPOSURE

CORE ANALYSIS	Predefined financial hedges and price correlations between commodities are applied to gross commodity exposure to determine net commodity exposure for the enterprise
OUTPUTS	A firm's net commodity exposure after incorporating its current risk management portfolio
BENEFITS	• Accounts for natural hedges • Provides management with an understanding of the effectiveness of the risk management portfolio vs. desired exposure • Provides broad understanding of how commodity price risk flows through the organization

While calculating net exposure, management must also take into account the correlation between commodity prices. Price movements of one commodity may be related to the price movement of other commodities, thereby increasing or decreasing exposure depending on the relative strength of the relationship. To account for this, the net exposure of the portfolio must be determined. On the tab labeled, "Simulation Net Exposure," the distribution of terminal price values for each commodity and time period (e.g., 1st quarter, 2nd quarter, etc.) are multiplied against volume for that same time period. A distribution of net exposures is generated and 5th and 95th percentile outcomes for the portfolio series are selected.

A company's net exposure to commodity price volatility is shown on the tab labeled, "Net Exposure." The predefined volume levels are multiplied by the new, correlated prices to determine the 95th percentile worst case net exposure. If the company is employing a hedging strategy for a commodity, then it has no exposure for that particular commodity since hedges are assumed to lock-in the commodity at the baseline, expected price.

STEP 6: HOLISTIC COMMODITY RISK PROFILE

CORE ANALYSIS	Commodity exposures and price projections are combined with predefined estimates for revenues and other fixed costs/SGA to illustrate both positive and negative impacts on the earnings profile
OUTPUTS	Pro forma financial statement with predefined revenue and fixed cost/SGA reflecting the impact of price variations and hedging on earnings
BENEFITS	• Enables objective evaluation and comparison of a wide variety of risk management strategies • Promotes risk mitigation at a portfolio level to minimize sub-optimal risk mitigation at an individual BU level • Gives management a view of earnings impact from commodity prices at different levels of probability

The process of determining net commodity exposure ends with the creation of a holistic, company-wide risk profile – with the sensitivities in price projections identified in Step 1 used to explore the potential impact on EBITDA, debt covenants, and other financial metrics. This impact is shown on the tab labeled, 'Interface' in the section called "Holistic commodity profile and impact on earnings."

CONCLUSION

Large and sustained commodity price swings are quickly reshaping industries and the businesses that exist within them. In this environment, commodity risk management must be firmly integrated into the strategy of the company and structured under a commodity risk management framework.

Executives need to recognize that their strategies may have to change to accommodate how volatile commodity prices are redefining their competitive landscape and develop a process to manage them across functions. Decisions around commodity risk management must be based on a forward-looking view. This process can include a series of tough questions about the sustainability of business models, such as:

- Will a perception of scarcity resulting from sustained volatile commodity prices impact that commodity's availability?
- Will changing commodity correlations invalidate diversification plays to hedge against other commodities?
- Will consumers shift to cheaper, private label alternatives or change their lifestyles to avoid expenses introduced by higher commodity prices?

The companies who are first to define their risk management metrics to include extreme prices and anticipate how they can best benefit from them will have a significant competitive advantage.

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OLIVER WYMAN AND THE ASSOCIATION FOR FINANCIAL PROFESSIONALS —THE FINANCIAL INSIGHTS SERIES

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