

Industrial products

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Managing commodity risk through market uncertainty



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The heart of the matter

Market volatility has industrial products companies rethinking how they manage commodity risk.

Rapid expansion in emerging Asian and Latin American markets, combined with the influence of hedge funds and market speculators recently boosted commodity prices to historic levels. These same forces, when combined with the realities of a global economic recession and an adverse credit environment, had the opposite effect, causing the price of commodities to plummet with alarming speed. This phenomenal volatility not only threatens the survival of individual companies, but also puts entire markets and industries at risk.

Much of the uncertainty is attributed to the attractiveness of commodities markets for financial players and hedge funds. An investigation by a US Senate committee estimated that, “over the past few years, large financial institutions, hedge funds, pension funds, and other investment funds have been pouring billions of dollars into the energy commodities markets—perhaps as much as \$60 billion in the regulated US oil futures market—to try to take advantage of price changes or to hedge against them.”¹

The advent of new commodities—principally carbon dioxide (CO₂) allowances—creates even more risk. As US corporations respond to pressures to go green, carbon takes on vital importance when companies make investment decisions and plan ongoing operational improvements.

There is also regulatory risk. Record commodity prices, the impacts of perceived—or real—speculative trading, and well-publicized abuses and losses associated with energy trading prompted enhanced US regulatory scrutiny of the markets. In this climate, the number of complaints and the frequency of active regulatory reviews here and abroad are likely to increase, as evidenced by the 2007 adoption of the Markets in Financial Instruments Directive (MiFID) by individual European countries. The new EU rules target commodity derivatives trading and ongoing review by the European Commission could cast a wider regulatory net, particularly with respect to energy derivatives trading.

Extreme fluctuation in commodity markets is not the only factor influencing business strategies in the year ahead. Changing world trade patterns, geopolitical risk, increasing regulation, and the effect of counterparty and credit risk issues all play into business decisions being made by executives at home and overseas. More immediately, the US economic stimulus and infrastructure spending package may have a significant impact on near-term demand and thus on commodity prices.

To understand how companies use trading and hedging strategies to respond to these pressures, a first step is to find out what the company is trying to achieve. Where is the company on the spectrum from engaging in proprietary trading for profit to using hedging to mitigate price risk? By clearly articulating its trading and hedging objectives, management sends a clear message on strategy and eliminates doubt and confusion among investors and other stakeholders.

¹ United States Senate Permanent Subcommittee on Investigations, Committee on Homeland Security and Governmental Affairs, *The Role of Market Speculation on Rising Oil and Gas Prices*, June 2006.

Manufacturers see commodities risk management as crucial to surviving economic downturn

According to a PricewaterhouseCoopers survey of leading manufacturers, 86 percent of senior executives said commodity price risk is important to a company's financial performance, adding that commodity risk was not managed well over the past two years.

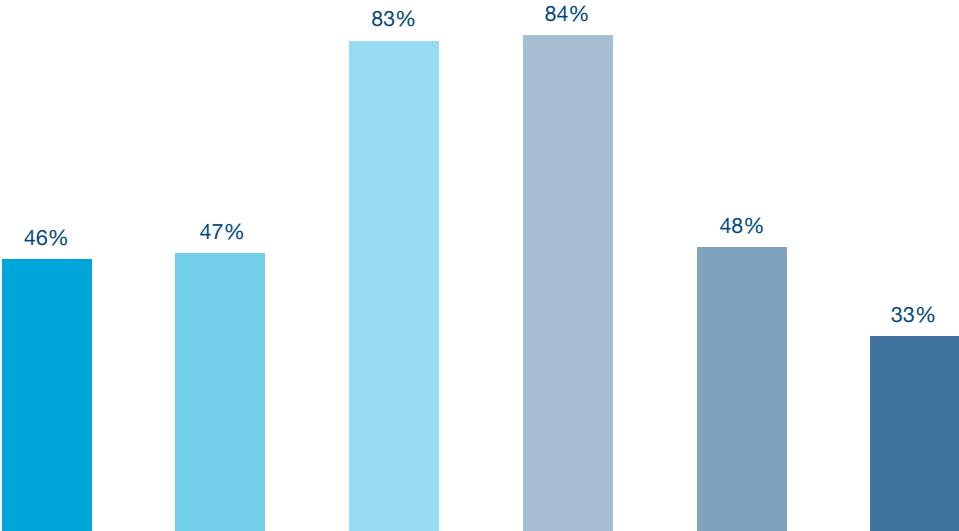
Only 16 percent of those surveyed believe their companies manage commodity risk "very effectively" over this time period, with most viewing their performance as somewhat effective (37 percent); The leading commodity risk exposures listed included: gas/oil (68 percent); metals such as steel and copper (67 percent); and electricity (33 percent).

Fewer than half (46 percent) of these organizations were able to alleviate price increases by passing them on to their customers. Forty-seven percent could pass on only some or very few of their price increases. As a result, many turn to other strategies to manage their risks, namely procurement contracts (83 percent) and cost reduction (84 percent). A large minority (48 percent) are turning to product reformulations or substitutions, and one-third use derivative hedging strategies (33 percent).

A large majority (88 percent) of senior executives said commodity risk management will be treated with the same level of importance (65 percent) or more (23 percent) over the next 12 to 24 months. Fewer than half (44 percent) expect to be able to pass along the majority of price increases to their customers over the same time period, and most (51 percent) believe they will be able to pass on only some or very few to none.

To manage price changes, many organizations plan to be more proactive by focusing on cost reduction strategies (81 percent), procurement contracts (79 percent), product reformulations/substitutions (49 percent), derivative hedging strategies (35 percent), and portfolio rationalization (33 percent).

Commodity risk management



Senior executives

- Alleviate price increases by passing them on to their customers
- Could pass on only some or very few of their price increases
- Turn to other strategies to manage their risks, namely procurement contracts
- Cost reduction
- Turning to product reformulations or substitutions
- Use derivative hedging strategies

An in-depth discussion

Industrial products companies face unprecedented challenges.

Most industrial products companies—those across sectors that include chemicals, industrial manufacturing, transportation and logistics, metals, engineering and construction, forest, paper and packaging, and business and professional services—adhere to one or more traditional approaches to managing commodity risk. Although conventional strategies were successful in the past, unprecedented volatility in commodity prices reveals their limitations.

To successfully navigate this uncharted territory in the commodity markets, manufacturers must embed effective risk management throughout their organizations. Serious thought must be given to new legal and organizational designs, and to the feasibility of changing to an independent and decentralized business model.

Most importantly, companies must identify and effectively control risks within and across departments and at the board level to effectively manage a company's accounting risk associated with financial instruments such as derivatives.

Price volatility

Commodity prices rose dramatically during 2007 and 2008. By mid-2008, increased demand accompanied record-high prices not only for oil, but also for most major commodities of interest to industrial products companies including aluminum, copper, steel, and iron ore.

This increase in price and demand was set in motion by many factors that combined to create market uncertainty. Economic growth in Asia and Latin America sparked demand and highlighted a scarcity of resources on a global scale. To secure the availability of certain commodities needed to sustain growth and meet public demands, companies and governments started investigating ways to stabilize their oil and gas commodities. Meanwhile, new market platforms were being established for gas, electricity, and CO₂ to name a few, in addition to an increased use of over-the-counter markets.

Construction industry copes with volatility in the price of building materials

According to Associated General Contractors (AGC), steel, concrete, and copper prices are all expected to rise. Another key construction commodity is gypsum, used primarily in wallboard and plaster. When single family construction started declining in early 2006, the price of gypsum fell dramatically. When the residential construction market was booming, wallboard producers struggled to keep up with demand and began creating additional plants. Now these plants are coming online, adding to the supply-and-demand mismatch.

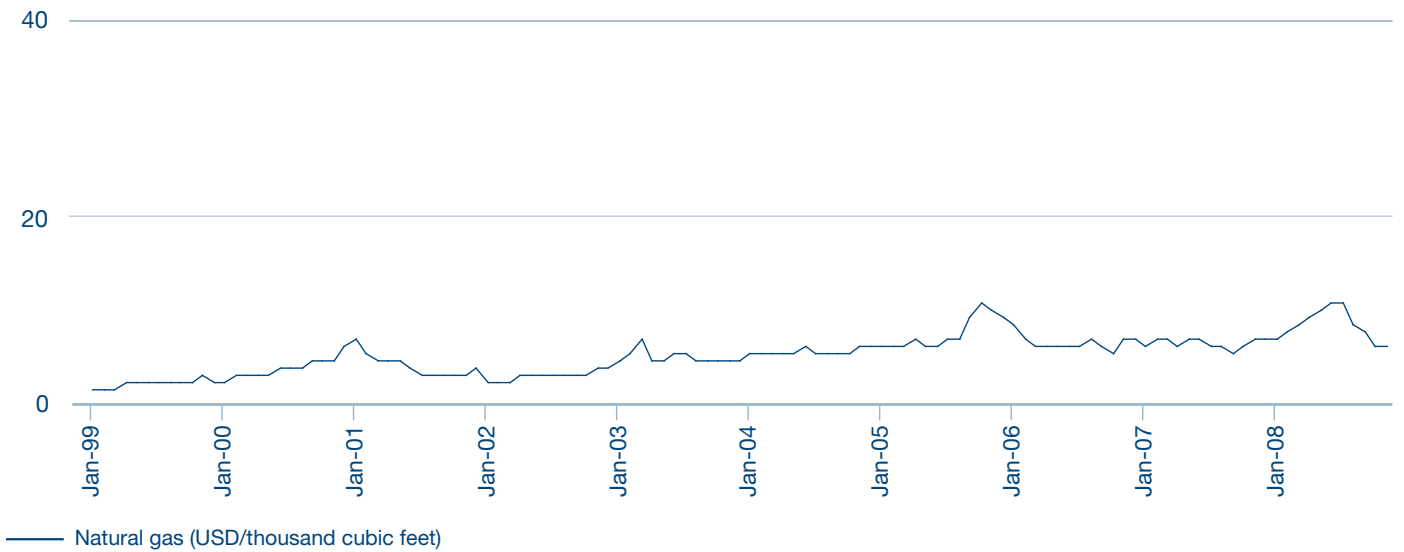
For builders, long-term contracts with fixed materials pricing and no-cost price escalators are becoming rare. Accordingly, contractors have begun to manage cost risk through hedging to mitigate the impact of price volatility on such products as diesel fuel, oil, and steel. Price volatility also may introduce the risk that counterparties are no longer willing or able to fulfill delivery obligations. Finally, transportation capacity as well as the price risk associated with shipping raw materials such as aggregates and steel must be managed to ensure physical supply and predictable pricing.

As fund managers increased their stakes in commodities, institutional investors poured huge sums into the market to balance portfolios. As a result, market prices diverged from predicted levels when prices were based solely on the underlying fundamentals of strong demand for energy and industrial commodities. This effect was exacerbated by the credit crisis, with players in the financial sector looking for new kinds of investments. Hedge funds played an increasing role and, in some cases, had a dramatic effect on rising commodity prices.

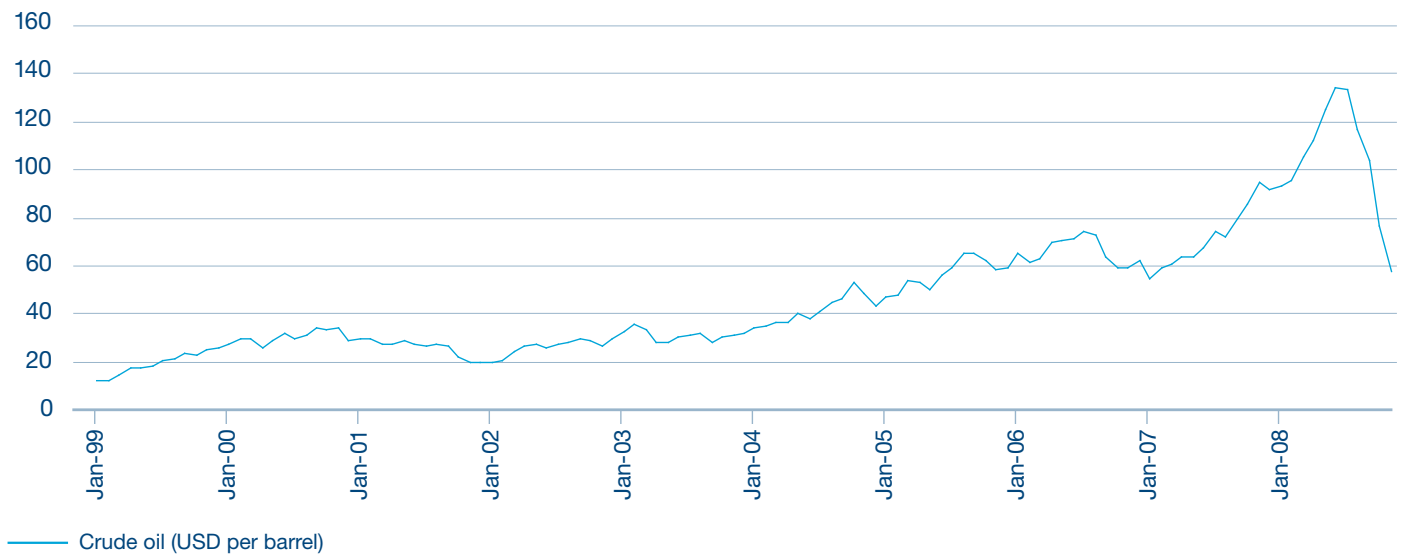
These events were followed by a near collapse of the global credit markets, and the eventual realization of a global recession. This culminated in the rapid sell-off by many of those same fund managers and hedge funds. Simultaneously, the underlying fundamentals of supply and demand weakened as the global economy slowed.

The following charts show how price trends for raw material commodities have behaved over a 10-year period, which clearly demonstrates the degree of volatility experienced in the past few years.

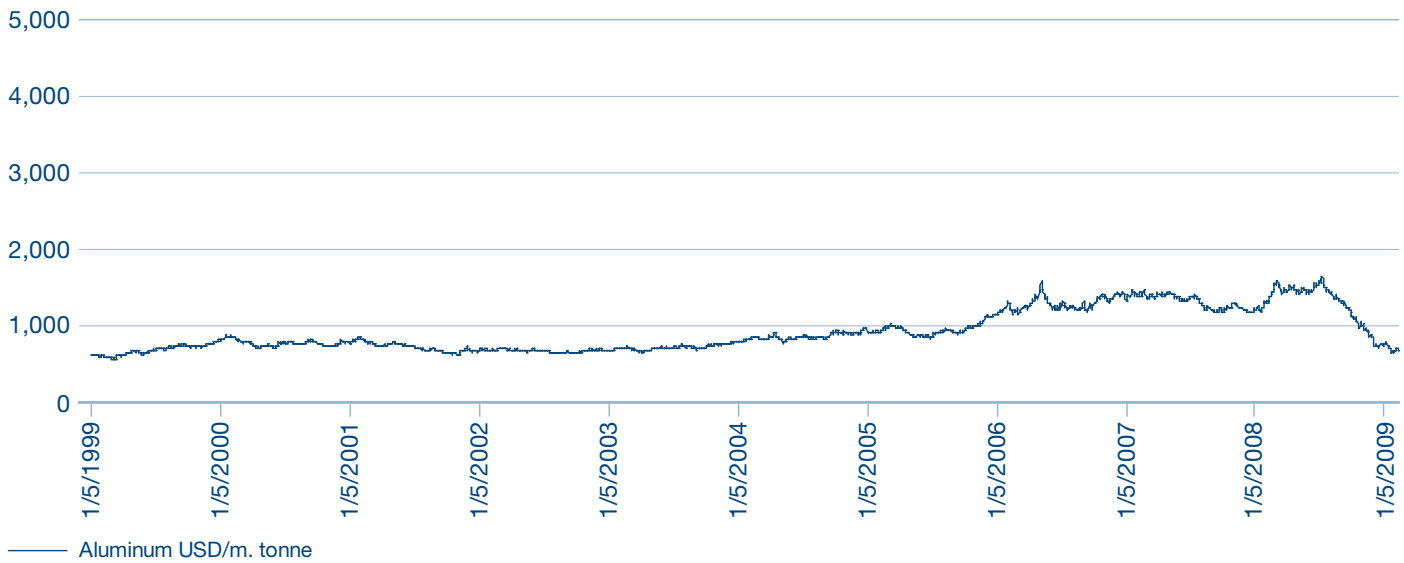
Natural gas pricing – 10 years



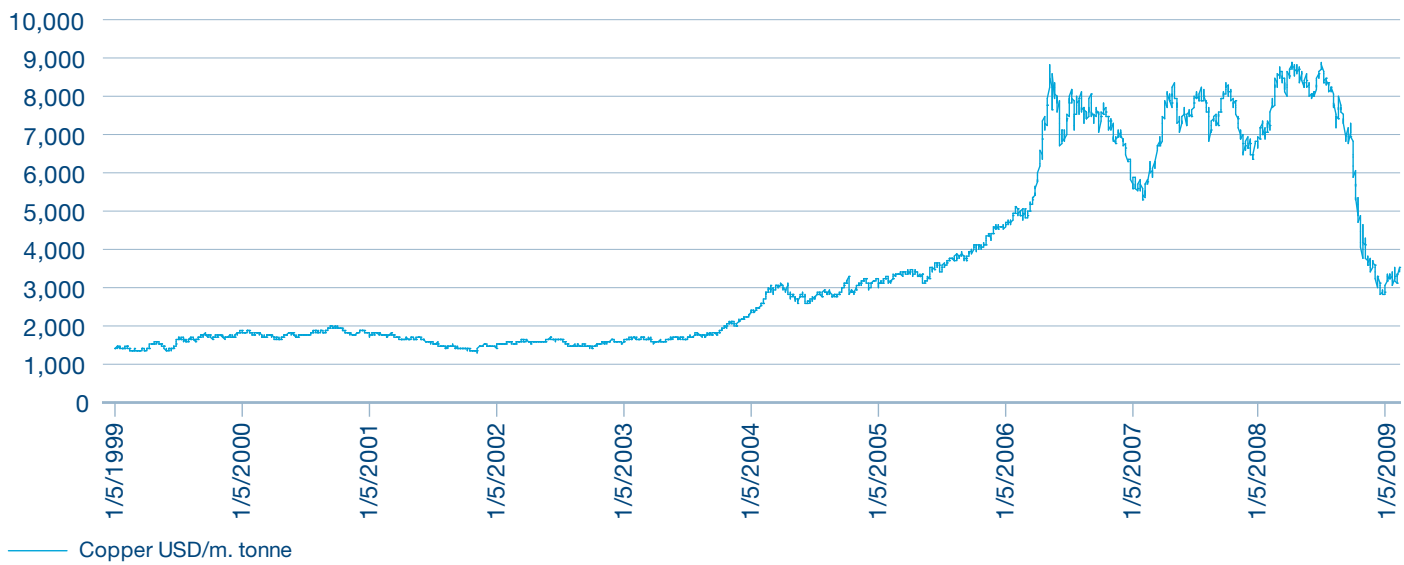
Crude oil pricing – 10 years



Aluminum pricing – 10 years



Copper pricing – 10 years



Steel and other manufacturing commodity prices fluctuate

After the roller-coaster ride that steel prices took in 2008, the benchmark hot roll price at December 31, 2008, was down approximately 15 percent from the start of the year and was 50 percent lower than the peak price in August 2008. The decline in the three-month LME price of unalloyed aluminum was more dramatic, with a nearly 40 percent drop from the start of the year and more than 50 percent from the midyear peak.

As a result of the global economic downturn, prices for steel rebar decreased significantly, and asphalt prices dropped even more in most parts of the United States. Falling demand for new construction and rising capacity also put downward pressure on cement.

With so much excess capacity from falling private demand, the government's expected push on infrastructure spending may help stabilize demand and prevent further price erosion, but it is not expected to raise prices much in the near term.

The unpredictable patterns observed in the past year highlighted the weaknesses in many risk management processes. As a result, CEOs are taking a closer look at their organization's ability to effectively respond to price fluctuations, as well as other unexpected turns in the market.

Although many turned their attention to how higher prices increased product profitability and cash flow risk, few were prepared for the implications associated with a rapid price decline that resulted in situations where hedged costs surpassed current market prices. Often, the cash flow implications of a risk management strategy were overlooked due to the emphasis on profitability.

Changing patterns of global trade

The demand side of the global supply-demand equation for most major commodities has shifted considerably, with the driving force for growth coming from the East rather than the West. China's economy expanded by more than 11 percent in 2007, representing the fifth consecutive year of double-digit growth and creating huge demand for energy and raw materials. It is estimated that more than 15 million people moved into China's cities from the countryside each year, driving unprecedented infrastructure, housing, and household product needs.

However, China's economy grew only 6.8 percent in the fourth quarter of 2008. This resulted in an annual growth rate of 9 percent for 2008, the slowest pace in seven years. The recession in the United States has reduced consumer spending and exports from China. This cut demand in China and placed significant pressure on the rest of Asia. Recent reports from China indicate that Taiwan's exports to China plunged 44 percent in December while Korea's dropped 30 percent, Australia's 25 percent, and Japan's 35.5 percent.

Continued efforts in the United States, China, and other developed countries to increase infrastructure spending may help mitigate the impact of reduced demand, but they are not likely to stimulate growth soon. Just as sudden shifts in global demand have driven down overall commodity prices since mid-2008, the market's expectations regarding the real impact of stimulus and infrastructure spending should begin to be reflected in forward pricing.

Although the current economic situation would indicate commodity prices are not likely to rise dramatically in the near term, there is uncertainty regarding the nature and effect of these governmental efforts to jump-start the economy. Many believe that the volatility experienced in 2008 will continue for the next few years. If so, it will affect the price of raw materials, so companies should review their current risk management practices and develop long-term strategies to be proactive.

In liquid markets such as aluminum and copper, it is common to use financial derivatives to manage price risk. However, it is not just the price risk that must be considered. Securing actual physical supplies of raw materials such as iron ore, electricity, coal, oil, gas, and even CO₂ allowances is vital. Some of these commodities are not physically tradable on the market. Other commodities, such as aluminum, copper, natural gas, and oil, are traded actively on global or regional markets and therefore can be managed through the use of financial derivatives. Price instability may also introduce the risk that counterparties are no longer willing or able to fulfill delivery obligations. Finally, transportation capacity as well as the cost associated with shipping raw materials such as bauxite, iron ore, and coal must be managed to ensure physical supply and a predictable price.

Geopolitical risk

The geopolitical risk facing companies in the industrial products sector is considerable and takes many forms. Heightened demand and scarce supply can disrupt production.

Geopolitical risk is not confined to civil strife. A key risk variable for companies comes from their relations with governments and the degree of uncertainty around regulatory frameworks. These risks arise from production sharing agreements or ownership rights in the extractive industries sectors. They can also involve risks related to government policies on different generation technologies, such as nuclear and renewable resources and carbon emissions that have a critical impact on investment decisions in the sector. The investment decisions regarding new production capacity can have a major effect on companies' commodity risks. The political environment is one of the decision drivers for new investments.

Industrial products companies will continue to see developing countries play a greater role in the industry as companies move their production facilities abroad. The drive to secure supply also directs global companies toward higher risk countries with commensurate increased instability in operational metrics and potential future supply. Not only has this contributed to diverging views by stakeholders about the projections for commodity supply and demand, but also it raises considerable global debate about the overall corporate social responsibility and the sustainability of industries that rely so significantly on those limited natural resources.

Geopolitical risk linked to financial crisis

According to a report released by Aon Risk Services on geopolitical risk and the credit crisis,¹ if commodity prices continue to fall as predicted by some forecasters, it could contribute to political and economic instability in a number of countries.

Miles Johnstone, director of Aon's Political Risk team, explained: "This year's (political risk) map reflects how the impact of the credit crunch is shifting from being an economic problem to a political problem. When an economy is in downturn, the government has fewer resources available to deal with issues when they arise, potentially leading to political instability." He cited the recent increase in widespread protests and street disturbances in Iceland and Greece as examples.

The financial crisis is also making the business of doing deals more risky. For example, when Kuwait's Petrochemical Industries Co. backed out of a deal to take a 50 percent stake in Dow Chemical's plastics unit, it embroiled the global chemical company in a contentious lawsuit over its plans to buy Rohm & Haas.

And a year ago, when Venezuela took over an Exxon-Mobil oil project as part of a nationalization drive, the oil company was forced to take action in the courts.

According to the Aon report, resource nationalism was prevalent last year when commodity prices were rising, and continues despite the fact that prices are now firmly on a downward trend.

1 Aon Political Risk Map: Political Stability Next Victim of Credit Crunch; Iceland and Greece serve as early warnings, January, 2009

Strategic investment risk

Greenfield construction

The increased demand generated by the emerging markets in recent years has placed a renewed emphasis on the development of greenfield production facilities. These projects may be undertaken for various reasons, including access to new markets, lower-cost production through the use of new technologies, and access to lower-cost or more abundant raw materials.

The protracted timetable for planning and construction poses an investment risk, as it increases uncertainty and makes companies more vulnerable to government policy reversals or changes in market economics. Market risk, in terms of demand and pricing, is a key factor in profitability assessments. Additionally, recent price volatility and the global economic slowdown raise doubts about the long-term viability of some of the higher-cost or “marginal” projects. The competitiveness of a company also may depend on the environmental sustainability of its production. This requires an assessment of the “CO₂ value” associated with an investment and must be an added fundamental factor affecting the profitability and planning of new investments.

Mergers, acquisitions, and industry consolidation

Despite the recent, challenging overall deal environment, there has been unprecedented global merger and acquisition activity in the past several years. High commodity prices, increased market capitalizations, and expectations regarding the long-term growth prospects in sectors such as metals and chemicals over that time have resulted in industry consolidation through mergers, acquisitions, and joint ventures. The recent declines in market capitalization following the credit crisis and economic recession reduced deal volume but also created significant buying opportunities that most certainly will trigger more activity.

Consolidation through acquisition is viewed as a viable growth alternative for companies without the long-term construction risks discussed above. This allows for the achievement of production synergies through scale. In addition, an acquisition that results in upstream integration is a key trend. High commodity prices combined with the weakening US dollar during 2007 resulted in a significant increase in international moves into the North American markets through the acquisition of US and Canadian companies.

Counterparty and credit risk

Because of the recent price volatility and the credit crisis, companies are showing a renewed focus on counterparty risk. Many are reevaluating policies for trading counterparties and renewing efforts to ensure that systems and controls in the front, middle, and back office are sufficiently robust to prevent or quickly detect rogue trading activity.

The degree of available credit affects trading activities, and companies are reassessing their access to the letters of credit, lines of credit, and collateralized deposits required by their trading instruments. This same credit risk also can have a significant impact on valuation of trading instruments. For instance, the recent widening of credit spreads has resulted in dramatic changes in the discounts rates that can be used in many valuation models. The uncertainty lowers confidence, creates more price fluctuation and raises borrowing costs. The increased cost of credit instruments, combined with high commodity prices, could affect the economic assessment of various trading and hedging strategies. If a company's risk management strategy cannot adequately reduce or eliminate volatility in earnings as a result of existing credit restrictions, it creates uncertainty in the ability to forecast earnings which may only aggravate the situation.

Compounding the situation, an economic downturn or lack of credit can increase the fall-out risk associated with customer contracts, leading to defaults on the underlying basis for a hedge position. This can create additional cash flow risk that is not always considered when establishing the original hedge position.

Companies are also reviewing many of the price and volume assumptions used to develop their longer-term risk management strategies. The recent volatility combined with the global recession creates an opportunity to stress test the assumptions used in models and to challenge conventional wisdom regarding their current understanding of the market fundamentals.

Counterparty risk in a global commodities market

The long-term physical supply and pricing of iron ore and coal, is subject to direct negotiation by a limited number of suppliers. Nearly 75 percent of the global supply of iron ore is controlled by the top three producers. In these situations, a key risk management factor is counterparty risk and the availability of supply.

Environmental risk

Environmental concerns are having an increased influence on global commodity pricing. Stakeholder engagement and the ability of companies to manage ongoing environmental sustainability will be viewed more and more as a competitive advantage. The involvement of local and national governments and nongovernmental organizations, such as environmental groups as well as investors and employees, will continue to pressure companies to responsibly manage these risks. The ability to manage environmental concerns will be a critical factor in the ability to secure and retain raw materials sources, financial capital, and human resources. Greenhouse gas emission regulations (reporting and trading) are being rolled out in a number of jurisdictions. This will continue to be an area of vital importance to the industry.

Carbon emissions—trading, offsets, and credits

Although the United States is not operating under a carbon emissions program, public debate over climate change intensifies daily. Already, a patchwork of regulatory standards and initiatives exists in response to growing public pressure on corporations to go green. Although a climate change bill was defeated in the US Senate in June 2008, it's likely that some form of national legislation on greenhouse gas (GhG) emissions will be put into effect under the Obama administration. This likely will create an enormous shift in the marketplace and affect many areas of the economy. Those companies with the greatest exposure to change will be the ones with the largest carbon footprints, in particular the utilities, energy, and many in the industrial products sectors.

The most sweeping regulatory options under discussion in Congress include the implementation of a GhG cap-and-trade program similar to the current EU policy. Since January 1, 2005, utilities, energy, and industrial product companies that operate in the European Union have been required to participate in the EU carbon trading program.

The introduction of emissions trading has created a source of commodity and investment risk. As the EU scheme moves into its second phase, carbon trading is set to be introduced in countries such as Australia and Canada. It is estimated that the United States could be home to a \$1 trillion carbon emissions cap-and-trade market by 2020.¹ Multinational investment banks are scrambling to develop brokerage capabilities to handle business in carbon trading activities.

¹ New Carbon Finance press release, "Economic Researchers Predict \$1 Trillion U.S. Carbon Trading Market by 2020" (February 14, 2008): www.newcarbonfinance.com/download.php?n=New_Carbon_Finance_Press_Release_US_Carbon_Market2.pdf&f=fileName&t=NCF_downloads.

Cantor Fitzgerald combined its businesses in pollution and carbon brokering into a single entity in anticipation of increased activity in the US carbon markets. Morgan Stanley and RNK Capital LLC are preparing to trade EU carbon credits after 2012. In addition, Citigroup Inc. and Cargill together purchased a minority stake in Sindicatum Carbon Capital Holdings Limited, a developer of greenhouse gas abatement technologies, in anticipation of carbon trading.

From a risk management perspective, market participants will need to evaluate the best way to adjust their carbon risk management strategy to effectively mitigate these risks or optimize carbon as an asset.

Airlines face carbon emission standards

The initial reach of the European Union Emissions Trading Scheme (EU ETS) was limited to the CO₂ emissions of stationary sources. Recently the European Commission agreed to a proposal to extend the reach of the scheme by targeting the CO₂ emissions of aircraft. Aircraft operators need to treat their inclusion in the EU ETS as a strategic business issue rather than merely a matter of environmental compliance.

The first compliance period for aviation will start and end in 2012. The second period will run from 2013 to 2020. Allowances for both periods will be granted on the basis of an application based on a report stating the transported passengers and cargo measured as tonne kilometres (RTKs) for 2010 on individual flight level, audited by an accredited assurance provider.

Emissions need to be reported and audited by 2010 as well, but allowances only need to be surrendered as from 2013.

By 2010, aircraft operators are required to have a reliable monitoring system in place, which must be submitted as early as mid-2009 to the competent authority.

Changing US commodity trading regulation

Trends in US commodity trading regulation continue to focus on transparency, self-reporting, and cooperation. The Commodity Futures Trading Commission (CFTC), through its enforcement of the commodities exchange act, monitors the integrity of the futures markets by protecting market participants against fraud, manipulation, and abusive trading practices. The CFTC's enforcement actions have been robust. The charges for these cases include lack of proper registration and reporting; misrepresentations and improper solicitations; fraudulent trading; and false price reporting.

What are the implications of this increased scrutiny? For one, management teams, even those with mature compliance programs, are reassessing the integrity of their internal processes. The combination of increased expectations from regulators on the attributes of company processes, the growing number of institutions engaged in commodity trading, and the related turnover of key employees has added to the frequency and scope of trading compliance reviews.

Managing through uncertainty

Companies have always managed—in one way or another—their exposure to commodity price risk. Recent price extremes, however, have caused many industrial products companies to view commodity risk as a critical issue that creates new challenges and opportunities due to heightened complexity and volatility in world markets. The current market landscape demands that management possess awareness and integrate risk plans into its strategy for addressing access to critical feedstock, price volatility, changing patterns of global trade, geopolitical risk, weather risk, emissions trading, and changing commodity trading regulations, among other factors.

Volatility in commodity prices is typically greater than volatility in other financial risk factors such as foreign currency or borrowing rates. For most industrial products companies, commodity price risk tends not be central to the company's value proposition. As such, shareholders generally have a low-risk appetite for commodity price risk. While shareholders can manage this risk through their own portfolio diversification, in most cases it is more effective and efficient for industrial products companies to manage this risk directly on behalf of shareholders. By effectively managing commodity price volatility, management can remove one source of “noise” in its business performance allowing resources to be focused on those activities (new product development, innovation, etc.) that truly drive shareholder value and enable sustainable competitive advantage.

Strategies for managing commodity price exposures can vary significantly across the industrial products sector. They range from knowing acceptance, through derivative hedging strategies, and through more sophisticated approaches such as proprietary trading or vertical integration. The appropriate strategy for any company can differ—appropriately so—based on its risk profile, objectives, and risk appetite. The nature of the risk management activity could vary widely by subsector, and the strategy is also greatly determined by the nature of the operations. For instance, producers are not focused solely on the price risk of their commodity raw material inputs; they may also manage their commodity outputs through active revenue price risk management. Commodity consumers, on the other hand, are more likely to be focused on the purchase price variances created by market volatility. Many companies, however, have a more diversified strategy comprising a blend of activities. The extent of each activity is based on the risk strategy and risk appetite of management. It is crucial to have a clearly defined strategy based on a systematic approach to managing these risks.

Traditional approaches are no longer adequate

Although there are several conventional ways to manage commodity price risk, unprecedented rises and falls in prices reveals a need for a new approach. Typically, many industrial products companies have taken on a “procurement” strategy, where the focus of risk management activity tends to be led by the procurement function and is geared toward ensuring that facilities have adequate supplies of high-quality, raw materials to keep plants operating. Although these are important issues, this operational focus has sometimes come

at the expense of effective management of financial risks. Companies that have an overly operational focus tend to exhibit the following characteristics:

- Commodity risk exposure is managed at operating units (plants, factories) and within the procurement function.
- Exposures are measured primarily on usage volumes and notional amounts, not true risk measures.
- Decisions about appropriate exposure management are made primarily on knowledge of physical markets, not sophisticated risk management techniques.
- Risk management strategies are geared more toward meeting short-term budgeted purchase or sales price targets or are focused on market opportunities (i.e., high degree of manager discretion).

Companies that take a traditional approach to managing commodity price are able to address mild volatility but not large or sustained increases or decreases in prices. Traditional approaches to managing commodity risk generally employ a series of risk management activities, including procurement contracts, financial hedging, passing on price increases to customers, and accepting cost increases and volatility in an uncoordinated fashion.

These approaches result in risk management programs that are often reactive in nature and biased toward market opportunities and short-term tactics, which leads to excessive trading costs and the potential for trading losses. Indeed, in the past year as commodity prices marched ever higher, many companies initiated or expanded hedging programs only to be punished when prices plummeted.

However, leading-edge companies do more than simply employ an uncoordinated series of risk management activities. Robust risk management programs help management review the company's complete risk profile, and management of such programs becomes an integral part of strategy setting by both senior management and business unit management. This approach helps focus management's vision on long-term goals and a holistic approach to managing risk and cost.

Three basic approaches

Based on experience working with leading industrial products companies, they tend to take three basic approaches to manage commodity price risk. These strategies are employed to varying degrees at many companies and are often used in combination.

Margin management

Most industrial products companies are consumers of commodities such as raw materials or energy to power manufacturing processes or distribute products. In a rising commodity environment, industrial product companies always have the option of holding sales prices firm to gain market share. In most cases, and for obvious reasons, this is not an attractive alternative as companies tend to focus heavily on product margins.

The most common and least expensive approach to managing price risk is to avoid the risk altogether by passing it on to your end customers. Industrial products companies that can do this successfully without having an adverse effect on sales volume have no exposure to commodity risk. In practice though, some level of price elasticity is typically at play in competitive markets. The extent of this elasticity depends on a variety of factors including overall strength of demand, level of product differentiation, capacity utilization, market concentration, and availability of substitute products.

For most of the recent past, with robust global growth and tight capacity across many sectors, simple price increases have been effective in the short term. However, with slowing global growth and excess capacity, this strategy is not likely to continue to produce results.

Procurement strategies

Beyond accepting price risk or raising prices to accommodate cost increases, many companies manage commodity risk through the procurement function. As noted above, typical procurement strategies focus on risks associated with availability and reliability of supply, product quality, and overall cost level versus some benchmark. But suppliers may also be an important way for industrial product companies to manage commodity prices. Typically, this can be done by entering into fixed price contracts of varying lengths directly with suppliers. This has the advantage of being the most direct mechanism for fixing input prices while eliminating the need to separately manage operational and financial risks. However, the advantages of simplicity may be outweighed by higher costs and reduced flexibility. Often, vendors may not offer the most attractive pricing and, at the same time, they often expect specific volume commitments associated with guaranteed pricing. In addition, in a rapidly rising price environment, holding suppliers to prices that may no longer be tenable often creates some thorny vendor management issues.

Hedging

Often, the most flexible and cost-effective mechanism to manage price risk is to use derivative financial instruments to synthetically hedge underlying price exposures. Derivative instruments are financial contracts that can either be traded or negotiated in a bilateral fashion (over-the-counter) between buyers and sellers of commodities. Market participants may include producers, processors, or consumers of the underlying

commodities and, increasingly, speculators looking to profit from commodity price movements or investors looking to diversify their portfolios.

In the foreign currency and interest rate markets, due to the breadth and depth of the markets, derivative instruments allow companies to effectively and efficiently manage their financial risks as the derivatives themselves can be tailored to meet the specific exposure of the end user. However, in the commodity markets, given the highly specific needs of end users' risk profiles with respect to specifications, timing, and delivery location, commodity derivatives may often be limited in their effectiveness. For instance, if a company would like to hedge a purchase of light, sweet crude in Texas, there are alternative derivative instruments to do so at attractive prices. Alternatively, a company looking to hedge a purchase of bunker fuel (for ships) at the Port of Miami may have less flexibility. It is this difference between the hedged commodity and the hedging instrument—often referred to loosely as “basis”—that limits the effectiveness of using derivatives in many instances.

In addition, derivatives may be viewed by some as highly complex tools that are fraught with risk. Given the long history of well-publicized incidents of flawed derivatives usage and the disparaging comments uttered by Warren Buffet among others, it is not surprising that in some quarters “derivative” is an unfavorable word. Like any other tool, when employed recklessly, derivatives can result in large, unintended economic losses. Just as it is wise to wear safety glasses when using a saw, it is also wise to ensure that your company has a well controlled and managed derivative hedging program. Implementation of such a program is discussed in the following section.

Despite some of the inherent limitations in using commodity derivatives, many industrial products companies successfully manage commodity exposure associated with energy purchases (electricity, natural gas, transportation fuels), industrial metals (steel, aluminum, copper) and precious metals (platinum, palladium), among others using derivative instruments.

Strategic alternatives

Alternative approaches to managing commodity price risk have the common theme of transferring risk to a third party: the customer (margin management), the supplier (procurement), or a third-party financial institution (hedging). In addition to these approaches, a range of other alternatives rely less on risk transfer or mitigation and more on a broader suite of responses that include acceptance of the risk, risk sharing, or avoidance altogether. Each of the alternatives discussed below—it will soon become apparent—are more radical in nature and get to the heart of broader business issues. To the extent that the three basic strategies are not completely effective, some of the following strategic alternatives may present some opportunities.

Asset-based trading

Optimization can be defined as maximizing the company's total margin over its value chain. This type of trading activity is asset-based, which means that commodity trading supports the optimizing of the production and sales portfolio. One of the tasks is to generate additional value from hedged positions based on market price views.

The decision on whether a commodity should be produced may be based on the expected price of the commodity at the time of delivery. This optimization activity is based on expected price developments and seeks to align the hedged position with this expectation (open an already hedged position or close an open position).

Another strategy is to optimize the production portfolio based on a real-option model. In this instance, commodity trading optimizes the production facilities based on the value of the option against the market.

From a risk management perspective, certain activities also may qualify as proprietary trading because a hedged position may be opened again through optimization.

As a result of these strategies, commodity trading plays a central role within the company's strategy. It is used to manage the asset base and can be seen in terms of asset management rather than trading. Such management may be limited to the short-term time horizon, for which the commodity markets are liquid. The long-term strategy and decisions, such as whether a facility should be constructed, may be made outside of the commodity trading environment. However, the long-term view of commodity prices and the entity's ability to manage these price risks should influence the decision.

Leveraging favored market positions

In many commodity markets, particularly those that are farther downstream or involve more refined products, there is sometimes little market depth due to the existence of a handful of large players. For companies that have large positions in fairly thin markets, there may be opportunities to realize benefit through more active trading of commodities and—in some cases—actually taking on a role of market maker. In select instances, some firms have decided to leverage their intimate knowledge of the physical commodity markets to actively trade for profit. This strategy is not one that is geared solely toward risk mitigation and, clearly, it involves risks. But companies with unique market insight and the skills and risk appetite to benefit from those attributes can make significant profits.

Vertical integration

One of the oldest strategies for managing commodity price risk is through vertical integration. Historically, many industry models have combined resources, processing, and market capabilities. However, though the 1980s and 1990s, leading business thought and practice has called into question this strategy arguing that investors could better manage price risk through portfolio diversification and that companies were better off focusing on consolidation of horizontal markets. In recent years though, particularly with the run-up in commodity prices, this view has been called into question. Indeed, many companies across the industrial products sector have begun, or continued to push vertical integration. Notable examples include BASF's growing investments in oil and gas (upstream integration), BHP and Rio Tinto's further push into metals processing (downstream integration) and FedEx and UPS both moving downstream through the acquisitions of Kinko's and MBE, respectively.

Although vertical integration may not be the most efficient way to mitigate commodity price risk, it can be effective. Moreover, whereas many of the strategies discussed herein are focused on mitigating volatility in the short term (e.g., hedging) vertical integration has the advantage of permanently reducing the commodity exposures.

Operational efficiency and flexibility

Companies also have pursued ways to reduce commodity price exposure through various operational mechanisms. Generally, these mechanisms are geared toward using commodities more efficiently. Some of these strategies may include:

- **Improved energy efficiency in processes and facilities**

A chemical client migrates to a new process technology that consumes less natural gas. Other companies replace windows, light bulbs, and HVAC systems within their facilities to save energy.

- **Flexibility in fuel choice**

Companies install equipment that is able to run on different fuels or replaced vehicle fleets.

- **Flexibility in operational processes**

Companies in processing-type businesses upgrade their facilities to handle a wider variety of input material. For instance, some metal companies can receive either raw metal or recycled product as input to rolling mills.

- **Optimization of distribution networks**

Companies continue to realize great efficiencies through re-optimization of distribution networks to reduce commodity inventory and minimize fuel consumption.

The range of alternatives to reduce waste and increase efficiency—all in the name of reduced commodity exposure—is virtually endless. Many leading companies are employing techniques such as lean manufacturing, as a way to identify and capture such opportunities. Lean manufacturing is a variation on the theme of increasing efficiency, decreasing waste, and using empirical methods to decide what matters, rather than uncritically accepting pre-existing ideas of what matters.

Innovate or die

One of the great fears heard by industrial product company leaders is that there will come a day when the margin management strategy will have been too successful. Specifically, while at the margin it may be possible for companies to pass along commodity price changes to their customers, over time, the impact of rising prices can gradually chip away at demand and, more troubling, introduce substitute products. This is seen most acutely in the energy sector. When oil is priced at \$80 a barrel, it may not make economic sense to grow corn for ethanol or to mine tar sands for oil. But at \$120 a barrel, new sources of substitute energy can be brought online, potentially altering forever the supply and demand dynamics of the energy sector. Likewise, in the industrial products sector at certain price levels, innovation can draw in new technologies and substitute products that can mothball entire industries overnight.

Ironically, the solution to the problem actually tends to be—innovation! Innovation is occurring in the chemical industry as producers seek out alternate feed stocks to develop products with similar attributes. It's showing up in the building products sector where producers try to differentiate their products based on their unique functionality and ability to reduce costs elsewhere (e.g., the rise of coated glass with light and heat resistant characteristics). And in the metals sector, innovative engineering solutions are being implemented to defend against substitution as well as reduce waste.

For any company, the key to successful innovation is a deep understanding of customer needs and an ability to craft a value proposition that successfully differentiates that company's products from the masses. This will allow for a sustainable competitive advantage to be built that can endure through market ups and downs.

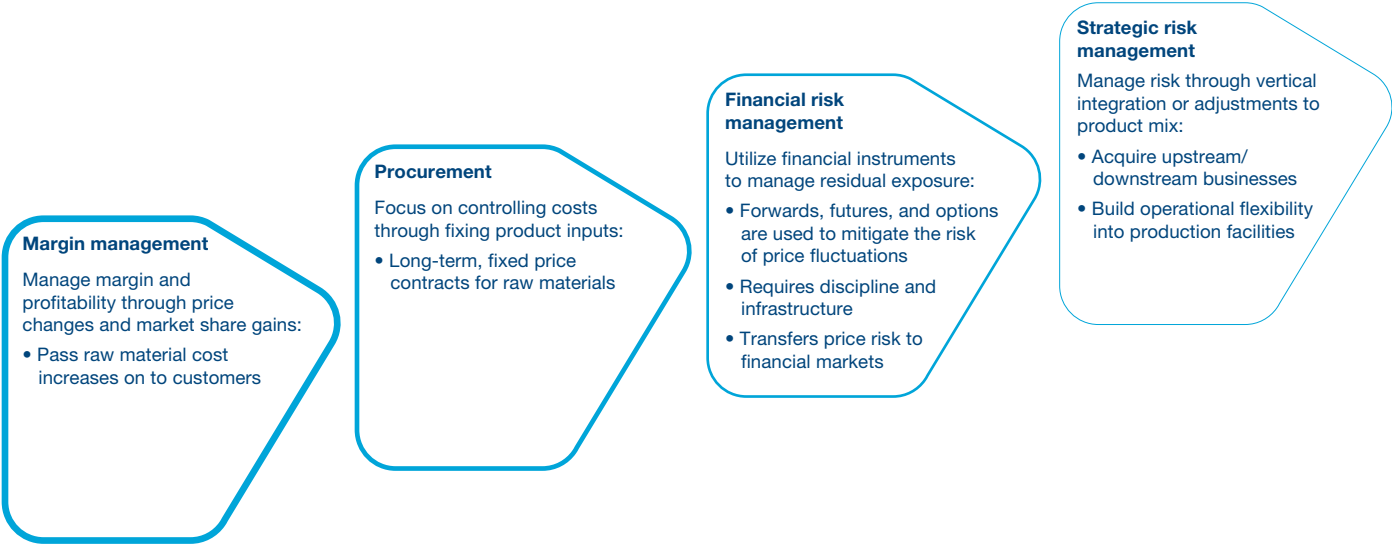
There is no silver bullet

Over the past year, commodity price variability has become one of the most significant issues facing managers of large, complex industrial products companies. Companies have tried—with varying levels of success—to apply some or all of the strategies listed above. Unfortunately, there is no single solution to effectively manage commodity risk. However, a robust and integrated approach that leverages multiple strategies and tactics across the business represents the greatest likelihood for success.

In addition to traditional risk mitigation measures including hedging, companies should take an integrated approach to reviewing commodities risk exposure throughout their organization. A cross functional review will allow management to identify not only areas of risk exposure, but also areas to improve efficient use of commodities along various points in the supply chain.

Starting with a framework and building out a structured approach can help create an environment for ongoing identification and risk management. It is important to focus first on what needs to be done and then to follow later by establishing appropriate roles and responsibilities based on specific risks or functional needs.

Higher cost, potentially lower effectiveness



What this means for your business

Companies that
successfully manage
risk have done so
by implementing a
structured approach.

With today's markets continuing to experience unprecedented volatility, companies are looking at commodity price risk management as an integral part of their strategy for managing costs and maintaining a competitive advantage. They require organizational structures that meet higher corporate governance standards than in the past as well as business processes that are controlled and disciplined, considering every aspect of the business cycle. No longer limited to hedging, companies are managing price risk across the value chain, from trading and supply to distribution and marketing, and implementing performance measures that are timely and relevant. To successfully manage the risk, companies are implementing a structured approach that identifies, assesses, and manages the exposure.

Assess the risks

The first step in the development of any risk management program is to identify and assess risk. For many companies, the identification and definition of commodity price risk may not prove to be too difficult. But truly understanding risk profiles requires that the company understand how changes in commodity prices affect financial and operational drivers. Typically, this analysis requires some level of quantification or use of analytical tools.

Initially, this may simply be focused on understanding how much of a commodity is consumed and how price changes impact earnings or cash flow. But a deeper analysis is often required—one that incorporates the impact of price elasticity and also the impact of embedded risks (i.e., those risks embedded with contracts that cause “non-linearity”). A common example of an embedded risk factor that is non-linear in nature is the classic fuel price escalation clause commonly found in shipping contracts. With such clauses, there is not a “one-for-one” change in shipping rates with increases in fuel cost. Rather, only if diesel fuel were to rise by “x” percent, might there be a consequent change in shipping rates. The entire concept of price-elasticity also calls for higher-end analytics. Much like brand marketers attempt to measure the effectiveness of advertising spend on sales volume, so too might industrial products managers analyze how changing commodity prices impact sales volumes and product margins.

In addition, the continuing integration of quantitative risk management concepts, such as cash flow distribution analysis (also referred to as cash flow at risk), together with corporate value driver analysis, is enabling companies to better analyze and develop their risk management and hedging approaches.

Determine objectives and set appropriate appetite and tolerance

Before commencing any effort to improve the overall effectiveness of a commodity price risk management program, management should develop and broadly communicate a clear set of objectives. Further, the objectives of a commodity risk management program should, of course, be aligned with the overall financial expectations of the company's stakeholders (including but not limited to investors). In practice, this value proposition is often unclear. Typically stated objectives may include:

- To reduce earnings volatility and protect a minimum cash flow
- To ensure that a specified debt covenant is not breached
- To hedge a fixed portion of production
- To monetize the value of the commodity in the ground

- To outperform budgeted targets
- To protect existing or anticipated underlying cash in relation to physical positions/investments
- To hedge exposure based on sales projections/orders and guarantee prices to customers
- To keep within predetermined price ranges

Once objectives have been set, management must define its risk appetite and set a quantitative risk tolerance that is cascaded down through the organization. The risk appetite is a higher level understanding of the nature and magnitude of risks that the company is prepared to bear. The company's defined level of confidence or "risk appetite" provides the foundation for establishing, monitoring, and modifying the hedge strategies used.

The risk tolerance is a specific number—measured in the same units of the objective—that serves as the signpost of limit when developing and implementing strategy. An integral step in setting risk tolerance is gaining a clear understanding of the sensitivity of earnings, cash flow, or other target financial ratios (implied by a target credit rating) to changes in commodity price variables. At the simple end, running high and low price forecasts through a budget plan can give an indication of the expected impact of financial risk on earnings. However, more detailed modeling of a company's supply and demand for capital under different corporate strategies (i.e., production mix/growth plans) with simultaneous flexing of financial prices based on historical volatility can provide detailed insight into many areas in addition to the requirement to hedge.

Finally, once management has agreed on an appropriate set of objectives, risk appetite, and tolerance—and these are all well aligned—the board of directors, based on its assessment of value to the shareholders, should validate the overall level of acceptable risk.

Identify and evaluate potential strategies

As noted above, there are a range of potential approaches that a company can take to address commodity price risk. In order to design an optimal company program, it is important to start by formulating an inventory of all feasible alternatives. This inventory should span the entire value chain of the industry sector—not just individually owned companies. As noted above, some of the most effective strategies may involve customers or suppliers and be strategic in nature.




Once a comprehensive view of all potential alternatives is established, each strategy can then be assessed and prioritized based on its costs and benefits. Prioritization using a visual tool such as a matrix can be helpful. By prioritizing the alternatives, management can then review the results and select the strategy—or series of strategies—that is likely to yield the best results at the lowest cost over the longest time horizon.

As noted above, it is unlikely that a single alternative will be the panacea. Rather, it is likely that a number of specific steps in concert across the value chain will allow a company to successfully manage commodity price risk.

Executing a hedging strategy

A risk management program requires investment in governance and organization, process, and infrastructure to support various functions, including risk analysis, deal execution, reporting, settlement, accounting, and control.

When designing and implementing a hedging program, considerations should include the following:

- | | | |
|--------------|---|--|
| Organization |  | <ul style="list-style-type: none">• Understand the range of financial instruments or derivatives available in the marketplace to mitigate exposure to the identified risks.• Evaluate the benefits, costs, and risks associated with the proposed strategy and tools to be used. |
| Process |  | <ul style="list-style-type: none">• Consider direct transactional costs (bid/ask spread) for using hedge instruments such as futures, forwards, swaps, and options.• Consider potential systematic costs of hedging reflected in the shape of the forward price or yield curve.• Consider the increased management and operational costs for the establishment and implementation of required systems. |
| Technology |  | <ul style="list-style-type: none">• Consider increased compliance costs associated with accounting, internal control, legislative, and stakeholder requirements.• Consider how the hedges to be used will qualify under the accounting rules. |

Any hedging program where the full economic effects are not properly understood, controlled, and managed, whether or not derivatives are used, can have disastrous consequences for an organization, its employees, customers, suppliers, and other stakeholders. There have been high-profile examples of hedging programs going dramatically wrong as a consequence of inadequate control and monitoring.

Recent high-profile collapses, although not directly resulting from the use of derivatives to hedge exposures, demonstrate the importance of good corporate governance and the necessity for both non-executive and executive management to understand fully the underlying risks in its business, including any associated hedging activities. Unfortunately, experience shows that although senior management usually understands these on a conceptual level, it often fails to establish an effective and appropriate governance and risk management framework to underpin its activities, leaving itself exposed to the risk of serious control failure.

Organizational design and process

Today's global business environment requires greater transparency in assessing the risks versus returns of business operations and more breadth and depth of financial and nonfinancial data to differentiate high-performing companies from their peers. The complexity and diversity of stakeholders requires a wealth of financial and risk data as well as operational performance data.

To cope with these challenges, leading companies have established effective organizational design, rigorous enterprise-wide risk management, sound compliance policies and procedures, and corporate governance frameworks that truly represent the interest of those stakeholders.

A commodity risk management program requires the right organization, processes, and infrastructure to realize the expected benefits.

By assessing its current approach to managing commodity price risk against leading-edge practices, companies should consider the key elements of the financial risk management framework.

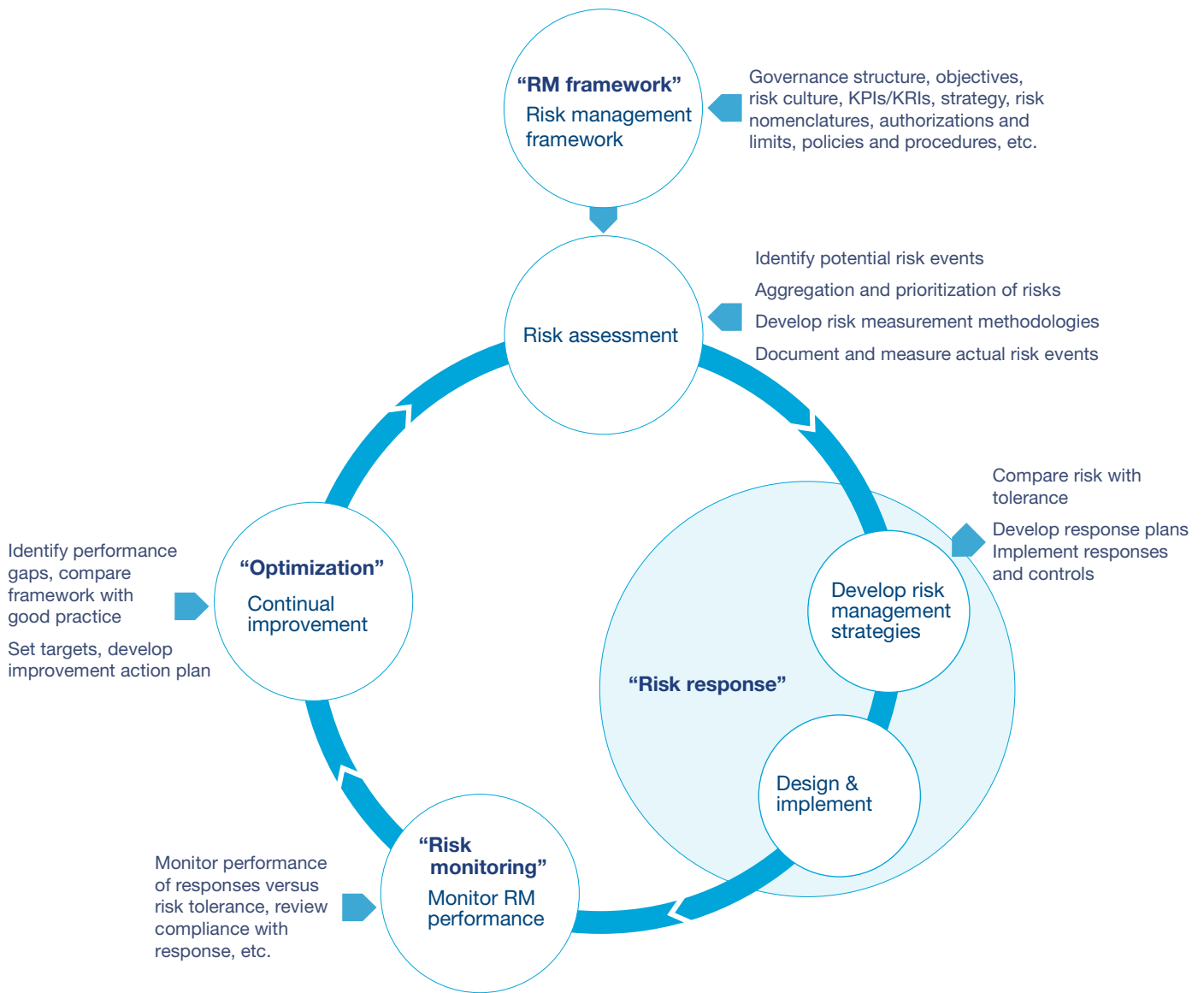
Among leading companies, there is a bias toward independent risk management functions. Corporate risk management often is established on a central level, responsible, among others, for consolidating the risks across departments/business units and across commodities. This is then supported by a middle office function on a decentralized level, responsible for the individual risks within a department/business unit. In these models, middle-office functions report to corporate risk management on policy compliance and

risk reporting. This is beneficial from an operational perspective yielding improved control of risk activities, procedures, and routines as well as adherence to controlling limits on the department/business unit level.

One of the challenges with an independent and decentralized risk management function is to ensure that individual risk components on a department/business unit level are also aggregated and monitored on a central level, and that hedging programs are fully integrated with business activities such as sales and production. The responsibility for the business unit's risks generally remains with the business unit to ensure a proper identification of risks arising, for example, from the physical side of the business.

Leading companies have set up a risk management infrastructure that monitors prices, volatility, maturity, volume variations, and basis risk in a comprehensive manner across all departments/business units and commodities. They have ensured that adequate internal processes have been established for transferring risks from, for example, the production and marketing departments to the trading and hedging department in order to properly manage the price risk embedded in both production and customer sales. To achieve this, these companies have developed appropriate mechanisms for internal transfer pricing that properly transfer risks and measure performance per department/business unit.

Given the importance of establishing an efficient structure for performance measurement and reporting of risk activities across business areas and commodities, leading companies have implemented a book (or portfolio) structure in support of the organizational structure. This book structure reflects the different roles and responsibilities for each of the business areas and commodities at a more granular level than the departmental structure. It captures individual commodity contract data and is used for identifying, measuring, and monitoring risks and returns of individual activities as well as for providing information for consolidation across business units and commodities.



Advancing your company's commodity risk strategy

If there is a single rule to follow in developing a hedging approach it is that a comprehensive study of the impact of risk should be carried out first. No common approach will suit every organization, and no single hedge approach will suit a company all of the time. However, identifying and maintaining an overarching consistent philosophy and set of objectives is paramount in achieving risk management best practice. Key points to consider when formulating your company's financial risk management and hedging approach are as follows:

- Ensure that your hedging philosophy can be supported by a thorough exposition of how it contributes to shareholder value (either by itself or, preferably, in the context of the wider financial and corporate strategy).
- Undertake a business impact analysis to understand properly and measure the impact financial risk is having on your business and how hedging might impact the objectives of internal and external stakeholders.
- Ensure there is clear communication to investors of the resulting risk profile.
- Conduct regular performance assessments of your hedge policy to ensure that objectives are being met. Has the business changed in a way that means the hedge approach needs revisiting?

Many companies already manage commodity risk in some form; however, benefits may be realized by adopting a more robust and integrated program. Improving the current approach may just be a matter of formalizing and standardizing risk monitoring activities across the value chain.

Executive leadership, assigning clear roles and responsibilities, and delivering training are all critical to gaining program support. Throughout the first stages, it is important to demonstrate small wins with tangible value. As the program becomes more robust, management should be able to refocus on core-strategic risks with frequent reviews of specific commodities risk thus enabling the company to move forward confidently and deliver value.

How PwC can help

PwC has a global expert team dealing with commodity risk management within the industrial products sector. We are able to support companies in all aspects of commodity risk management including the following.

Risk assessment

- Risk identification
- Risk measurement and analytics

Strategy and policy

- Development of clear objectives for commodity risk management and trading within the company that is aligned with the corporate risk capacity and risk appetite
- Development of clear policies and strategies for commodity trading and risk management
- Re-alignment of policies and strategies with market changes and new developments

Commodity trading operations

- Design of organization, processes, and internal controls
- Implementation of organization and processes
- Improving effectiveness and efficiency of trading execution
- Testing/audit of trading control framework

Trading systems

- Support in selection of the best fit commodity trading system
- Implementation and customizing of systems
- Testing of systems

Compliance

- Support in assessing regulatory requirements
- Support in registration with national authorities
- Review of compliance with regulatory requirements

Governance

- Support management in design of governance and control framework
- Support internal audit of trading activities
- Training for management, internal audit, and other employees

Accounting

- Support in evaluation of accounting impact on new products
- Support in writing accounting guidelines, including tools
- Support in development of book structures in accordance with IAS 39/FAS133
- Training regarding accounting issues

Taxes

- Support on transfer pricing issues
- Support on VAT issues

Corporate transactions

- Revaluation of commodity trading positions
- Due diligence of commodity trading activities
- Valuation of commodity trading business and contracts

Contacts

To have a deeper discussion about how commodity risk may impact your business, please contact:

Bob McCutcheon
US Metals Leader
Phone: 1.412.355.2935
Email:
robert.w.mccutcheon@us.pwc.com

Peter Frank
US Industrial Products
Director of Enterprise Risk
Management
Phone: 1-646-471-2787
Email: peter.frank@us.pwc.com

Neelam Sharma
US Industrial Products Director
Phone: 1-973-236-4963
Email: neelam.sharma@us.pwc.com

Dean Simone
Industrial Products Cross LOS
Assurance Leader
Phone: 1.267.330.2070
Email: dean.c.simone@us.pwc.com

Tracey Stover
US Industrial Products,
Chemicals Leader
Phone: 1.267.330.2425
Email: tracey.a.stover@us.pwc.com

Barry Misthal
US Industrial Products
Industrial Manufacturing Leader
Phone: 1.267.330.2146
Email: barry.misthal@us.pwc.com

Karen Vitale
US Industrial Products
Advisory Leader
Phone: 1.973.236.4459
Email: karen.vitale@us.pwc.com

H. Kent Goetjen
US Industrial Products
Engineering & Construction Leader
Phone: 1.860.241.7009
Email: h.kent.goetjen@us.pwc.com

Ken Evans
US Industrial Products
Transportation & Logistics Leader
Phone: 1-305-375-6307
Email: kenneth.evans@us.pwc.com

Michael Burak
Global Industrial Products
Tax Leader
Phone: 1.973.236.4459
Email: michael.burak@us.pwc.com

Todd Stroup
US Industrial Products, Forest,
Paper, and Packaging Leader
Phone: 1.678.419.1418
Email: todd.a.stroup@us.pwc.com

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