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Enhancing the long-term financial plan:
What natural resource and commodity businesses need to succeed

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To thrive in a volatile and unpredictable post COVID-19 economy, companies need more flexible and rigorous financial plans.

The dynamic and often unpredictable realms of agriculture, energy, and mining demand a robust approach to financial forecasting and planning. Different organizations have varying flavors of the long-term financial plan, typically called the "Multi-Year Plan" or "Long-term Capital Plan", but commonalities exist across the industry. On an annual basis, entire finance teams will dedicate their time towards developing a multi-year financial plan which typically provides single point financial estimates, sometimes accompanied by key scenarios of interest, for management to review.

With **COVID-19** and the **2008 Financial Crisis**, the **21ˢᵗ century is now on track for one major volatility event per decade**. Given the turbulence seen in commodity prices, and the subsequent impact on company financials, (Exhibit 1) it raises an important question: are the prevailing long-term planning processes adequate?
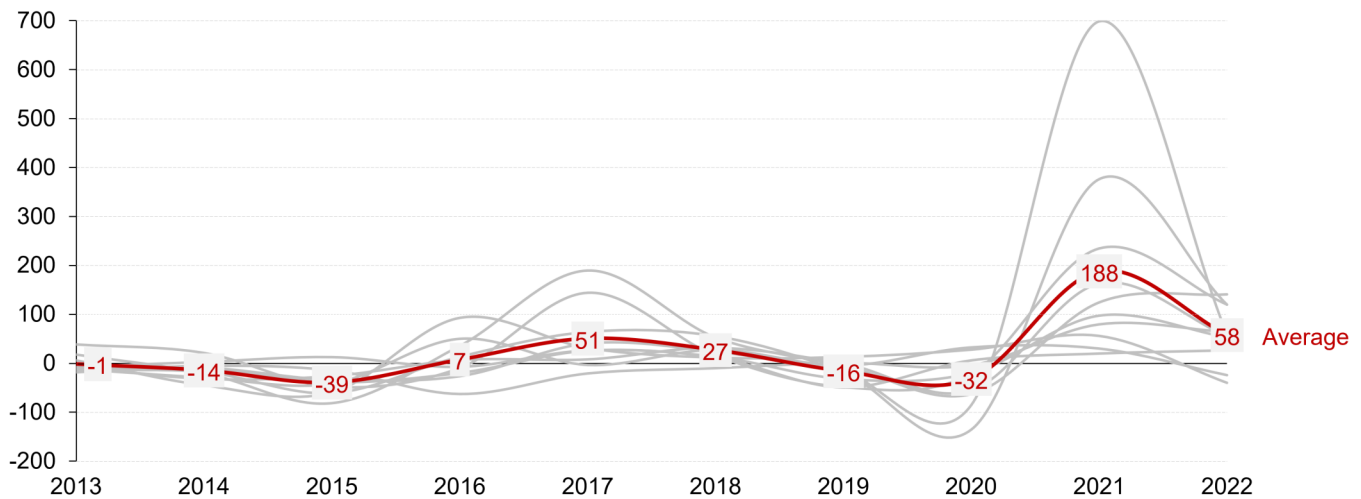
Exhibit 1: Commodity price volatility and its impact on profitability

Select Commodity Prices, Annual % Change (2003-2022)
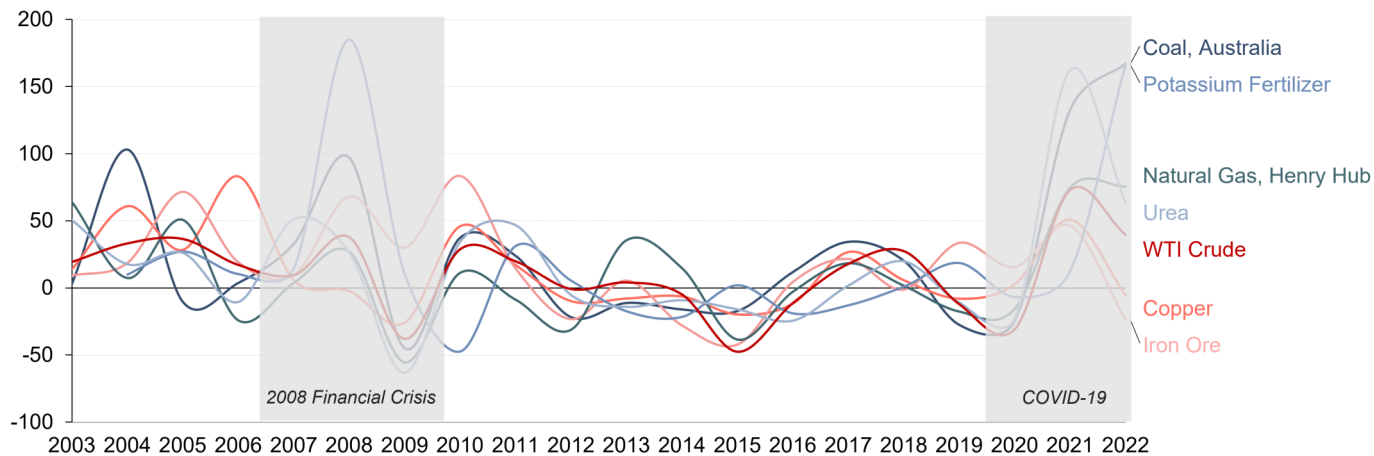
Source: Primary commodity price system database, International Monetary Fund

Largest Global Natural Resource and Commodity Companies, Annual % Change in Gross Profit (2013-2022)

Source: Yahoo Finance. The ten largest companies, as measured by market capitalization, included in the S&P Global Natural Resource ETF (agriculture, energy, mining). These companies comprise over one third of the index's market capitalization.

The COVID-19 market volatility translated into massive annual shifts in the earnings of natural resource and commodity businesses. However, even during periods of relatively stable commodity prices (e.g., 2013-2019), it's not uncommon for gross profits to oscillate by as much as +/-100%. With this context, the value of a single-point multi-year financial plan, even if accompanied by a few choice scenarios, is put into question.

This whitepaper presents the challenges organizations currently encounter in developing an effective long-term financial plan and introduces the integrated probabilistic planning approach as a solution to make financial planning a more valuable exercise. This solution is driven by three core pillars:

Embrace probabilistic thinking. Companies that understand and plan for a range of financial trajectories, using tools such as Monte Carlo simulation, are better equipped to navigate the inevitable ups and downs of the market.

Enhance the capital allocation framework. Companies that employ a collaborative process with a centralized investment committee enable better decision-making. Getting to "best in class" requires both a portfolio and project view of risk and return.

Understand risk in more depth. Companies that leverage advanced analytics better understand the uncertainty associated with investment decisions and financial plans. Executives that prioritize and focus on the top drivers of financial variability can direct risk management efforts more effectively.

The perils of neglecting probabilistic planning

The 2020 COVID-19 price crash saw 45 North American upstream oil and gas bankruptcy filings, including major multi-billion-dollar companies such as California Resources Corporation[1]. The narrative behind these bankruptcies is similar: producers took on too much debt and failed to adequately hedge price risk. It's tempting to dismiss COVID-19 as a "black swan" event, but that ignores the broader context of operating a business in a high volatility sector.

While certainly negative oil price days were unforeseen, prices in the ~$20-$30/bbl range over several months with an annual average of ~$40/bbl were not without precedent. Similar price levels were seen in 2015/2016 and were commonplace in the early 2000s, as shown in **Exhibit 2**.

Exhibit 2: Monthly oil prices in nominal dollars

Cushing, Oklahoma West Texas Intermediate Spot Price, USD per Barrel
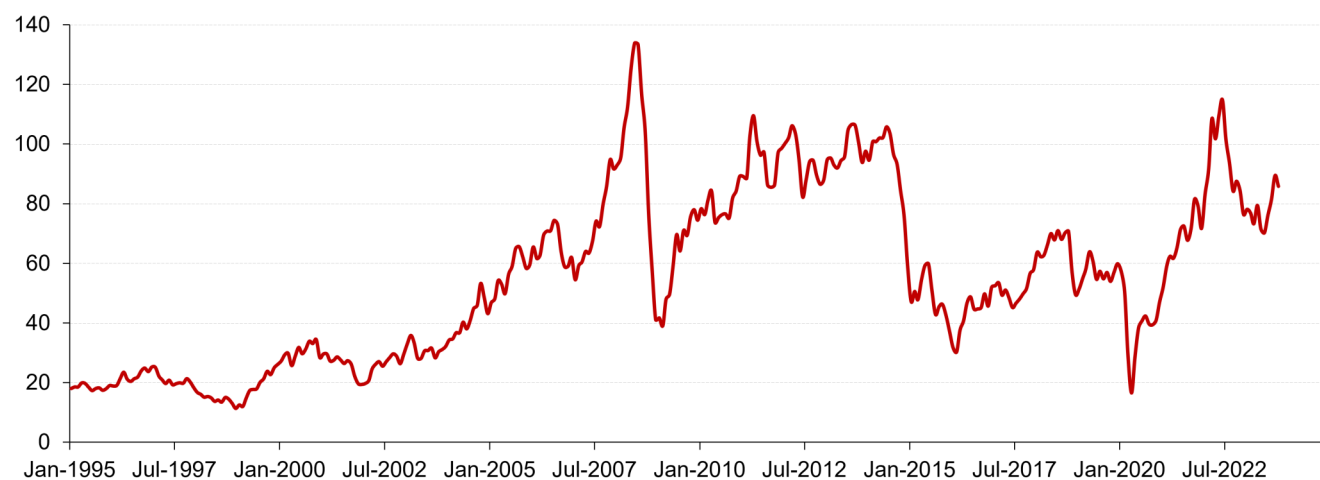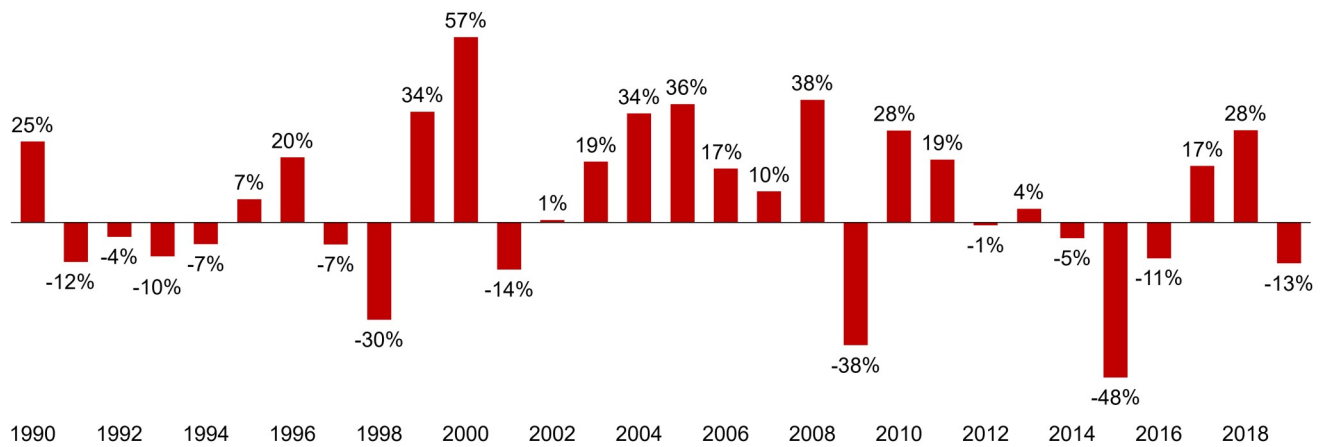

Source: U.S. Energy Information Administration (EIA)

An overly simplistic view on historical volatility can help illustrate the point.

Exhibit 3 shows the annual average percentage change in oil prices over the 30-years leading up to the 2020 price collapse. The three worst years witnessed declines of 48%, 38%, and 30%. Based on 2019 price levels, these decreases would equate to a 2020 price below $40/bbl – akin to a 10th percentile scenario or 1 in 10 chance, as extrapolated from the 30-year record.

Exhibit 3: Annual oil price deviation relative to previous year

Source: U.S. Energy Information Administration (EIA)

Strategic Decisions Group's proprietary probabilistic price forecasting model draws on historical volatility and futures market data. At the end of 2019 the model was projecting a $40/bbl year for 2020 as a ~5% probability. However, over the 2020-2025 planning period, the odds of encountering at least one year below $40/bbl escalated to ~45%.

Major financial stress at these upstream producers over a typical five-year planning period had **odds that were similar to the flip of a coin**. While probabilistic forecasting is not flawless, the complete **absence** of such **analytics** can lead executives to **underestimate** the **risks** inherent in their business.
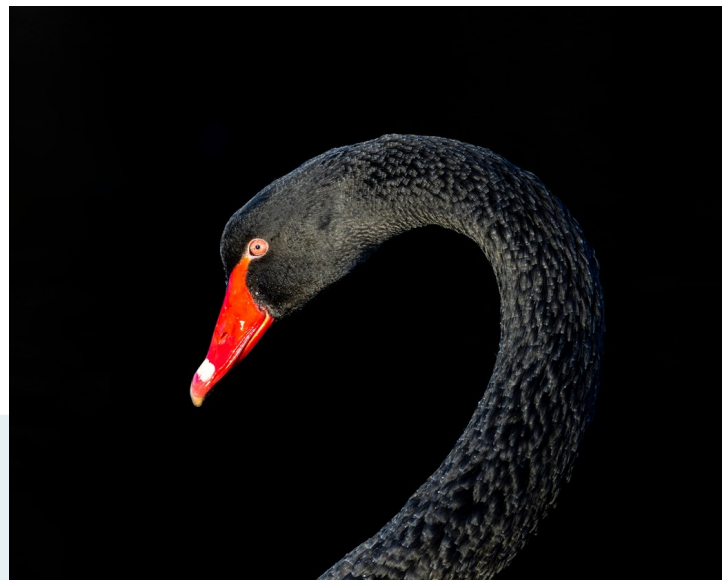
The oil and gas sector's struggle with the global shock of COVID-19 is just one example. The problem of price volatility is common across commodity markets and can be unique to local conditions.

Take for example, Winter Storm Uri in 2021, which overwhelmed the Texas power grid, resulting in widespread blackouts. Wholesale spot prices for electricity in the Electric Reliability Council of Texas (ERCOT) market skyrocketed from levels typically below ~$100/MWh up to $9,000/MWh.

This extreme surge put electricity providers under severe pressure with some declaring bankruptcy, such as Brazos Electric Power Cooperative, the largest and oldest power cooperative in Texas.[2]

Preventing bankruptcy is a cornerstone of financial planning and risk management. Yet, **a more common issue is the inability to invest effectively for the future**.

Energy, mining, and agriculture sectors often face long development timelines for large capital projects, usually spanning 3-10 years. It becomes difficult to invest in these timescales when the company's financial outlook and projected capital availability fluctuates significantly, as seen during the 2020-2023 cycle.

Recently, mining companies have cut back on investment capital in favor of increasing dividends and share buybacks[3]. Investor pressure coupled with a more conservative investment philosophy is potentially leaving value on the table as the energy transition accelerates demand for critical metals. The uncomfortable reality is that many organizations are biased by current market conditions, disregarding the fact that a project's value is contingent on commodity prices over the next two or three decades.

The challenge with point estimates and scenarios

Traditional financial plans often rely on **single point estimates**, which are **inadequate** for capturing the volatility inherent in commodity-linked businesses. Such estimates can misleadingly imply a degree of certainty that does not exist in these dynamic markets and fails to communicate with management where the business could realistically be over a multi-year period.

Scenario planning offers a broader view than single point estimates and is an improvement. However, commonly used "low" and "high" scenarios are often **nebulous** and lack a clear indication of their likelihood. Scenarios can also be selective, leading to **blind spots**, and due to the availability bias gravitate towards "hot topic" cases. Scenario planning promotes a "know and then act" framework where in reality management must "act and then know".

Scenarios are effective in stretching an organization's thinking and brainstorming new strategies for consideration. However, they are less valuable for understanding the range of financial outcomes a business may face in the coming years.

Additionally, the scenarios utilized in financial plans typically **fail to adequately reflect correlations** across different product lines and Business Units (BUs). This oversight can lead to a skewed understanding of how variables interact under different market conditions. The scenarios presented often either understate or overstate the likely financial impacts.

For example, **Exhibit 4** shows a variety of energy commodities in a hypothetical portfolio that have some degree of correlation. Yet, the scenarios presented to management might assume a universal "high" for all commodities or allow only one commodity price movement per scenario. The result is **misleading and uninformative findings** presented to management.

Exhibit 4: Imperfect price correlation among energy commodities

Select Energy Commodity Prices, Indexed 2013 = 100, $
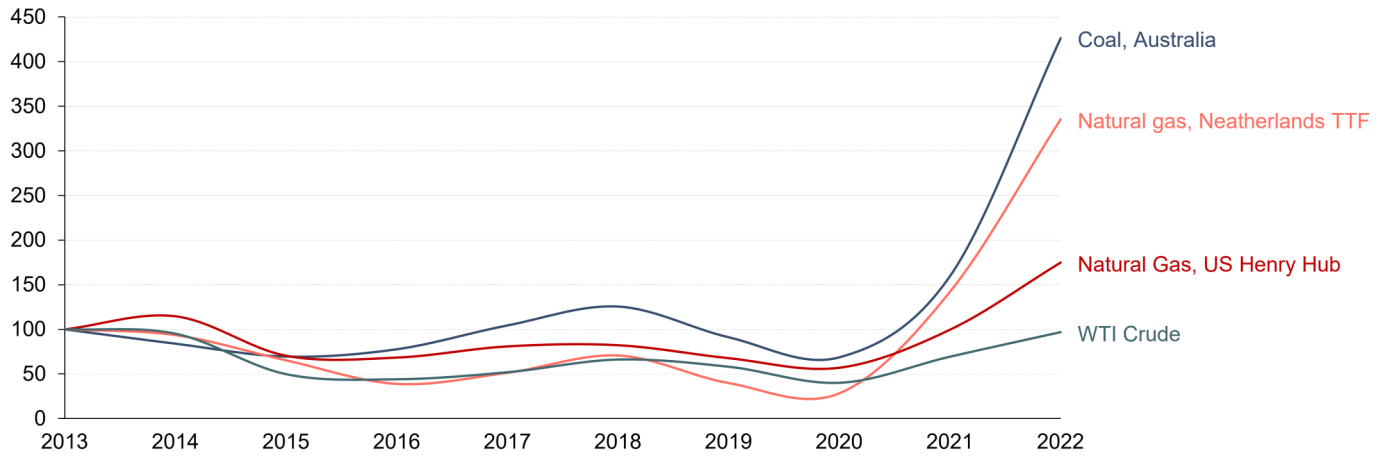
Source: Primary commodity price system database, International Monetary Fund

The struggle in capturing a broad spectrum of potential financial outcomes makes it **difficult to thoroughly comprehend and plan for risks** in the business.

While management will often have an intuitive sense of the key risks for the business, the long-term financial plan will likely have little to say quantitively on how probable or how big these risks are. Shining a light numerically on these risks can allow for a more robust discussion for budgeting and capital allocation.

The organizational complexity of financial planning

For many organizations **getting a quality single-point estimate can be difficult**. Often, there's ambiguity between what is considered an **estimate versus a target**. For instance, a multi-year plan's ambitious target might motivate employees but may not serve as a dependable guide for capital budgeting and corporate finance decisions.

Furthermore, the plan itself is often a roll-up of financials from different BUs and finance teams leading to **spreadsheet chaos**. The use of various spreadsheets with differing standards across an organization can cause inconsistencies and errors, making it difficult to have a unified view across the company. Financial planning is often an iterative process that can be **time-consuming** and **cumbersome**.

The budgeting and **capital allocation process** itself often **incentivizes biased inputs** from the BUs. Typically, the BUs aim to showcase their operations positively to secure more capital or resources. BU-driven project proposals often turn into sales pitches rather than being part of a collaborative, strategic capital allocation process. This also disrupts the risk management objective of a multi-year financial plan as **downside risks** are **understated**.

Ideally, management will develop investment capital alternatives in partnership with the BUs and objectively consider the risk and return of different strategies. However, traditional multi-year financial models often lack the flexibility to evaluate different strategic pathways efficiently for the business.

Moving towards a more valuable financial planning process

Addressing the challenges in long-term financial planning and forecasting for natural resource and commodity businesses necessitates a **shift from traditional models to an integrated probabilistic approach**. This requires a mindset change away from "rolling-up" BU financials towards a more collaborative process that leverages common corporate assumptions and explicitly brainstorms strategic alternatives before any spreadsheets are touched.

A robust probabilistic financial model, synchronized across all business units, can manage correlations and the evaluation of alternative strategies efficiently. Leveraging **Monte Carlo simulation**, these models **produce thousands of scenarios** for how the business may trend. Instead of a solitary forecast, this method provides a range of potential outcomes. The modelling should be sufficiently detailed to capture key business risks while also being adaptable for quick updates. This approach offers management a broader perspective of where the business might reasonably trend (Exhibit 5).

Exhibit 5: Illustrative EBITDA projections with probabilistic ranges

Illustrative EBITDA Estimates, Billions $
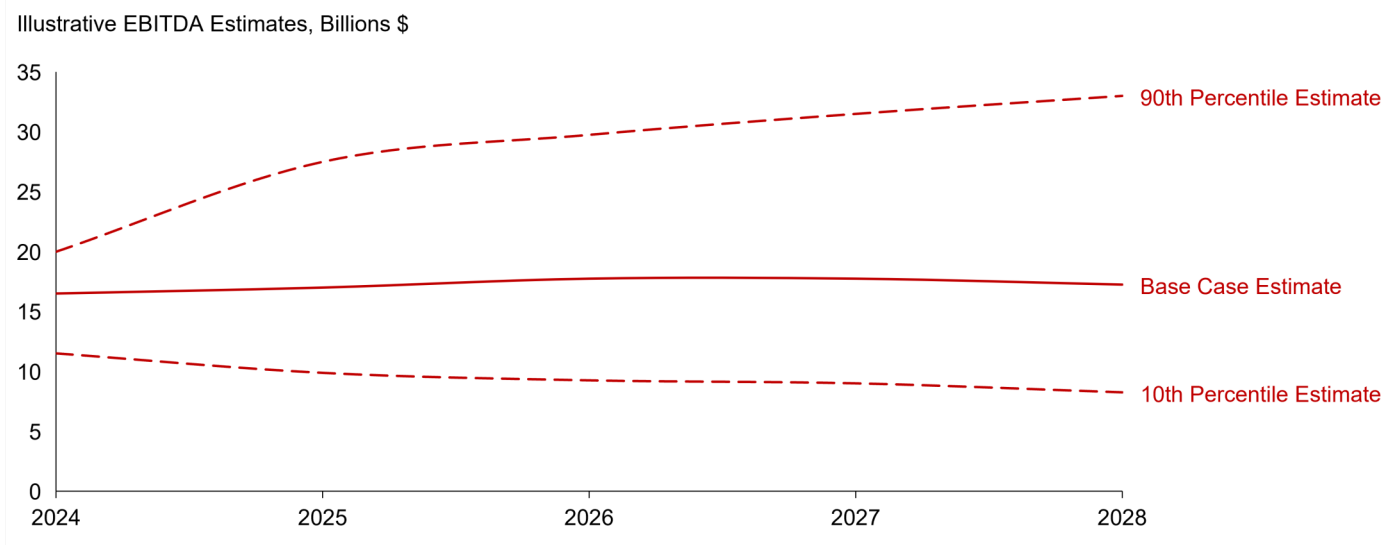
The integrated probabilistic approach **enhances capital planning discussions**. For instance, capital can be allocated to match different cash flow percentiles based on the company's risk appetite. A company may wish to establish a budget at the 30th percentile of estimated cash flows to establish a margin of safety. A probabilistic analysis also allows for the assessment of potential impacts of large project capital overruns, providing a more informed view for setting budgets.

Most importantly, alternative capital allocation strategies can be tested to better understand the range of financial risk and value generated (Exhibit 6). A **centralized investment committee** with clear decision criteria and a **consistent evaluation framework** ensures transparency and fairness in the capital allocation process.

Exhibit 6: Illustrative strategy comparison for investment expansion with higher risk and reward

Illustrative Free Cash Flow Estimates, Billions $
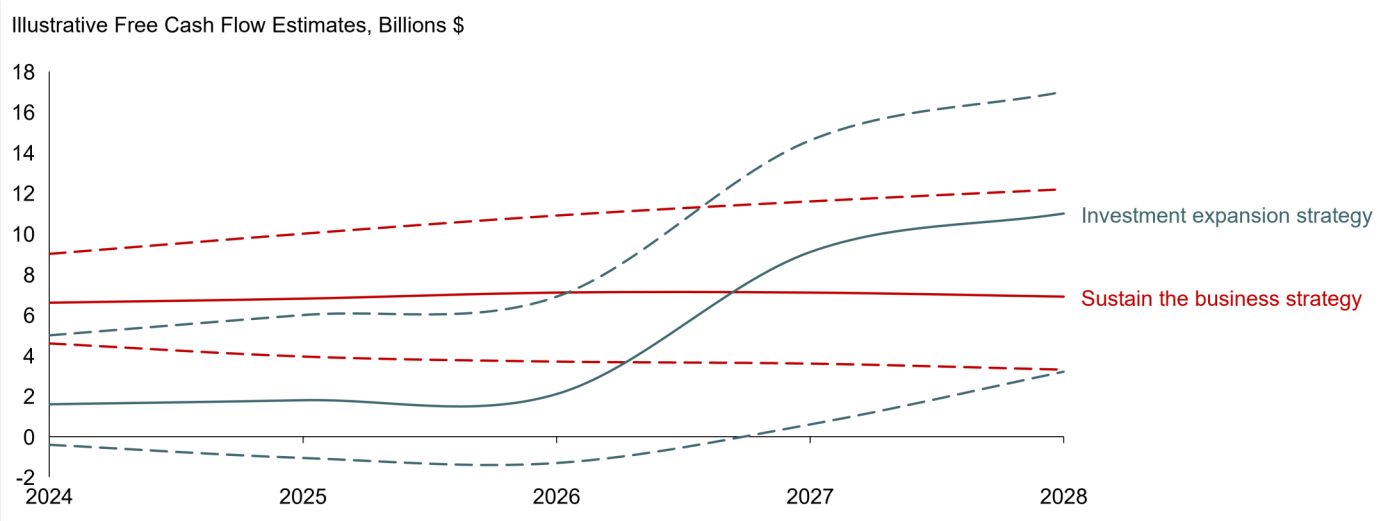
Adopting a probabilistic financial planning approach facilitates **deeper conversations on risk**. It quantifies and makes transparent the uncertainty associated with key assumptions. **Exhibit 7**, for example, presents an illustrative "tornado diagram" for a hypothetical commodity mining company. It ranks pivotal assumptions in the multi-year financial plan according to their volatility and ability to impact the overall financials.

Typically, a handful of risks account for most of the volatility in company earnings. This allows management to prioritize and focus on the top drivers of financial variability and direct risk management efforts more effectively. It also facilitates effective discussion on company strategy and whether certain BUs are generating a sufficient return relative to their risk levels.

Exhibit 7: Hypothetical financial risks for a company with operations in copper, gold, and silver

Illustrative Free Cash Flow, 2024-2028 [billion $]
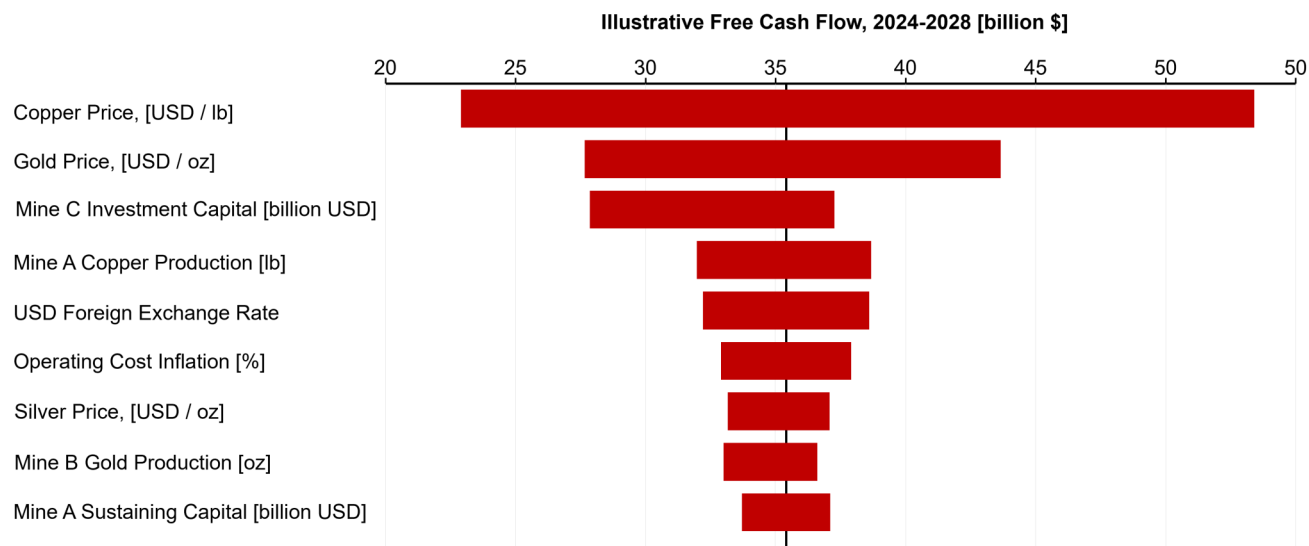
Properly accounting for correlations across product lines and BUs can lead to a more realistic understanding of potential financial outcomes. In an organization's portfolio of products, several commodity prices, each with their distinct correlations, will jointly influence financial outcomes.

The range of financial results shown should consider these correlations in the analysis as well as the fact that some commodities are cost inputs while others generate revenue. For instance, natural gas is a key cost component in the production of ammonia and eventually urea. Hence, high prices received for the end product will be partially offset by the high cost of feedstock. By capturing these interdependencies, a more effective discussion on the product portfolio and market strategy can take place.

A probabilistic financial model that's seamlessly integrated across all BUs can be updated efficiently. This integration means that changes in inputs or decisions, like investment capital thresholds, can be quickly reflected in the model. **As management grows comfortable with ranged estimates, the need for precise updates diminishes, freeing up valuable resources and time.**

The adoption of a probabilistic approach has yielded immediate and tangible benefits for numerous organizations. Consider the case of a global commodity mining and manufacturing company producing multiple commodities. The company's financial planning process was notoriously time-consuming and failed to deliver the insights management required for effective capital allocation. In response, the finance team invested in developing a probabilistic planning process.

This new framework was designed to capture the uncertainty and when relevant correlations associated with variables such as commodity prices, production, regulations, foreign exchange, inflation, operating costs, and mine capital. The outcome was transformative. Management gained a more nuanced and comprehensive understanding of the company's financial trajectory. Importantly, this enabled a more robust process for capital allocation and portfolio strategy.

But perhaps the most significant shift was cultural: the organization moved away from crafting overly "precise" financial plans to engaging in richer discussions about market strategy and risk mitigation.

Implementing an integrated probabilistic planning process requires organizations to embrace probabilistic thinking, enhance their capital allocation framework, and understand risk in more depth (Exhibit 8).

For over four decades Strategic Decisions Group (SDG) has been on the forefront of decision science and strategic planning. By embracing SDG's approach, clients gain a more nuanced, realistic, and agile understanding of their financial landscape, enhancing both strategic decision-making and overall financial resilience.

Exhibit 8: Moving towards a more valuable financial planning process

Integrated probabilistic planning process best practices

Embrace probabilistic thinking

- Enhance multi-year financial plan spreadsheets with Monte Carlo simulation capabilities
- Shift focus away from "precise" financial plan estimates and move towards discussion on the range and likelihood of potential financial trajectories
- Calibrate forecasts to understand the accuracy of your financial plan estimates

Enhance the capital allocation framework

- Establish a centralized investment committee with a common evaluation framework
- Analyze risk and return from a portfolio perspective before focusing on project decisions
- Establish clear decision criteria and ensure critical assumptions are discussed in depth
- Develop portfolio and project level strategic alternatives for consideration collaboratively

Understand risk in more depth

- Utilize decision science to understand the key drivers of financial plan variability
- Leverage advanced analytics, such as stochastic price models, to go deeper on risks
- Analyze historical deviations from the financial plan and uncover organizational bias
- Deep dive on scenarios with significant financial stress and develop mitigation plans

References Index

[1] S&P Global, North America posts 45 upstream bankruptcies in 2020: report.

[1] Reuters, U.S. oil producers on pace for most bankruptcies since last oil downturn.

[2] Reuters, Texas power cooperative files for bankruptcy, citing $1.8 billion in grid debt

[3] S&P Global, Growing mining industry dividends, buybacks going 'too far'

About SDG

Strategic Decisions Group is a strategy consulting firm renowned for applying leading-edge theory to uncover opportunities for creating shareholder value. We guide our clients to find innovative, creative strategies to thrive today, while also helping them build internal competencies to meet competitive challenges in the future. As a result, we are the preferred strategic partner to many in the Fortune Global 500.

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