



FE-2 & RM&IM PROJECT WORK

REPORT

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Hedging Commodity Price Risk – Plan & Considerations



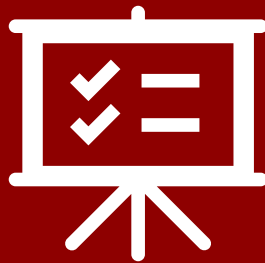
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INTRODUCTION



Before getting into the crux of the project, it is crucial to have a clear understanding of the topic and defining the objectives to be achieved. Throughout the process, these serve as a reminder of what our final learning goal. Not only that, but they also help us evaluate our performance once the project is completed. So, let us get some context first.

We have recently been appointed as the Treasury Head of a company that manufactures steel. One of the raw materials utilized in the process of manufacturing steel is gas. Thus, our company is exposed to the fluctuations in the price of gas. After significant research, our team strongly believes that our company should consider hedging specific cash flows from the manufacturing process requiring gas inputs. At the Investment Committee discussion, we present our plan to hedge commodity price fluctuation risk in line with the guideline issued by the industry regulator in relation to companies using commodity derivatives for hedging. The stakeholders express their concerns as to what could be the key challenges that the company might face in implementing the idea presented by us. A gist of the concerns expressed by the stakeholders is reproduced:

- Lack of knowledge about hedging and use of appropriate derivatives
- Impact of the hedging strategy and its benefits vis-à-vis its costs and risks
- Lack of clarity on the role and responsibility of personnel in the new plan
- No prior experience on the usage of automated systems

We have noted the concerns expressed at the Investment Committee discussion. This report shall evaluate the benefits and costs associated with the usage of commodity price derivatives and address the concerns stated hereinabove. In addition to this, this report will provide an impartial view to the Investment Committee by covering the following aspects:

- Ideal plan for implementation of the hedging program in a time-bound manner
- Types of derivatives that can be used to hedge commodity price risk
- Pointers to be kept in mind while selecting the derivatives to hedge commodity price risk
- Rational explanation as to why hedging is beneficial as compared to keeping the position open





WHAT IS HEDGING AND DERIVATIVES



Before dealing with the more detailed aspects, we must understand the concepts of hedging and derivatives.

There are several risk management strategies that a firm implements to offset their exposure to the numerous types of risk. These risk management strategies are not only used by financial institutions but also by business organizations who are exposed to commodity price risk, operations risk et al. Hedging is one such risk management strategy that is implemented to offset or neutralize probable losses that may arise by taking an opposite position in the same or any asset closely resembling the characteristics of the underlying asset. To put it simply, hedging is an insurance against an adverse event. If an adverse event does happen, an investor or organization that has hedged their position suffers a lesser impact. For example – an organization engaged in the exports with U.S.A. might hedge their exposure to fluctuations of the dollar.

Hedging involves the use of financial instruments called as derivatives. Derivatives are financial instruments whose value depends on the values of other, more basic, underlying variables. Often, the underlying variables are the prices of traded assets. For example – a stock option is a derivative whose value is dependent on the price of a stock. There are many types of derivatives namely forward contracts, futures, options, swaps et al. These derivatives are traded on Over-the-Counter markets as well as exchange-traded markets. The usage of derivatives as a tool for hedging requires thorough understanding of the dynamics of the type of derivative used. Moreover, it also requires the investor or organization to evaluate the cost, benefits, and risks associated with the derivative and hedging strategy.





ADVANTAGES AND COSTS AND RISKS OF HEDGING



In the previous section, we acquainted ourselves with the concept of hedging and derivatives. In this section, we will go a step forward and understand the purpose and importance of this risk management strategy. We will also consider the benefits of hedging vis-à-vis the costs and risks involved.

As we have previously understood, hedging is like taking out an insurance policy. It cannot guarantee the occurrence of an adverse event but can reduce or even eliminate the downside in case the unexpected event occurs. Hedging is not only implemented by investors but also by business organizations exposed to risk. Hedging gives such organizations surety about their profit levels, cash flow projections and enables them to manage their finances efficiently. It is an effective tool which helps companies tide over the fluctuations of the market. In addition to this, sometimes, hedging also helps organizations in increasing their profit levels. These reasons and many more make a strong argument on the need of hedging.

Having understood the ‘why’ of hedging, let us evaluate its advantages vis-à-vis the costs and risks associated with it. The benefits of hedging are as under:

- Reduces or eliminates potential losses
- Capital protection in case of black swan events
- Increases liquidity which offers investors and companies greater flexibility
- Effective risk management strategy for investors and companies with low risk tolerance
- Companies can overcome uncertainty caused due to market fluctuations
- Using hedging companies can lock in their profit
- Most importantly, a successful hedge safeguards companies against commodity price changes, foreign exchange fluctuations and interest rate changes

While hedging does seem lucrative, there are several costs and risks one must bear in mind before implementing the strategy. A slight mismanagement in implementing the strategy could cost dearly and lead to exponential losses. There are several instances where a mismanaged hedging strategy has led to bankruptcy of companies. Hence, it is essential to consider the flipside of this risk management strategy which will enable the company to make an informed decision. The costs and risks associated with hedging are as under:

- While hedging reduces volatility, it also reduces the potential for higher gains
- Hedging involves the purchase of derivatives. If the transaction is not properly planned (size and timing), the transaction costs can be heavy and eat up the returns
- Mismanaged strategy can lead to liquidity crunch which may eventually lead to bankruptcy
- Lack of knowledge and gap in communication regarding hedging strategies between the Board and the management can lead to conflicts
- Hedging may sometimes lead to fraud
- Sometimes hedging requires active trading strategy. This could be costly
- Hedging seems to be futile or necessary if the market is performing well

- Insufficient supervision may lead to inflated profits
- Hedging lowers risk thereby returns. This is not attractive for risky investors who like to maximize their returns by investing in high-risk companies
- Hedging requires expertise and automated systems. Thus, the company might need to invest heavily in human and technology resources
- Any risk management strategy requires precise and thorough documentation and clear demarcation of roles and responsibilities. This might lead to diversion of resources in meeting the prerequisites before implementing the strategy

We are certain that the yin and yan of hedging presented hereinabove will give the Investor Committee a balanced view of hedging. In the coming section, we will introduce commodity price risk, how our company is exposed to it, and an ideal plan for implementing a time-bound hedging program to reduce the exposure or completely neutralize commodity price risk.





COMMODITY PRICE RISK AND THE HEDGING PLAN



As a steel manufacturer, our company heavily utilizes on gas as raw material. However, since our company does not deal with the production of gas, we procure it from third-party vendors. This exposes us to commodity price fluctuations. Hence, it becomes imperative for us to understand commodity price risk before formulating and implementing our hedging strategy.

Commodity price risk is the possibility that commodity price changes will cause financial losses for either commodity buyers or producers. Buyers face the risk that commodity prices will be higher than expected whereas producers or sellers face the risk that the commodity prices will be lower than expected. These price fluctuations can be because of individual factors or their interaction. Some factors include politics, seasons, weather, technology, and market conditions. Commodity price risk is faced by businesses and consumers and not just traders in the commodity markets. Sharp fluctuations in commodity prices are creating significant business challenges that can affect production costs, product pricing, earnings, and credit availability. This price volatility makes it imperative for an entity to manage the impact of commodity price fluctuations across its value chain to effectively manage its financial performance and profitability. Thus, it becomes essential to hedge commodity price to ensure stability in business operations and cashflow management. Commodity price risk is an important element of financial risk management and is significantly managed by companies by implementing hedging strategies. To hedge the commodity price risk faced by our company, we recommend implementing either of the following hedging plan:

- We require gas on a large scale 6 months from now to complete a steel order. We are concerned that 6 months hence the price of gas will be higher than what it is now, and we are exposed to the rising price of gas. This might lead to an increase in the price of the final product which may discourage our customers to purchase steel from our company. To eliminate these concerns and hedge the exposure, we recommend taking a long position in a vanilla call option for the tenor. A call option is an option contract between two parties where the buyer of the call option earns a right (not an obligation) to exercise the option to buy a particular asset from the call option seller for a stipulated period of time. Our position in the call option shall cover our total predicted exposure. In case our prediction is spot on, and the price of gas rises, we will have to pay more for the gas to our original seller. However, this loss is offset by the gain that we will realize on the long call option. The net effect will be that we will be purchasing gas at a certain price. On the contrary, if the price of gas decreases, will be benefit from the fall in the price, however, our call option will not be executed and will expire worthless. In this manner, we can implement this hedging strategy using options to mitigate our exposure to the fluctuations in the price of gas.
- Alternatively, we could also use futures or forwards in our hedging strategy. Our team suggests the use of futures since they are exchange-traded and regulated, thereby reducing the counterparty risk. Since we are using gas as our raw material, we could take long position in exchange-traded gas future contracts for 6 months. If the price of gas rises, the loss incurred in

buying gas at a higher price will be offset by our gains while settling our long position in the future contracts. In the event the price after 6 months decreases, our loss incurred due to the long position in the futures contract is offset by our gains earned due to purchasing gas at a lower price. However, in the latter scenario, we will be exposed to margin calls!

We can also hedge commodity price risk using complex derivatives such as vanilla swaps, commodity swaps, and options on swaps. However, these complex strategies entail higher costs and can cause misinterpretation when a stakeholder looks at it. Thus, we recommend hedging the fluctuations in the price of gas by implementing either of the above-mentioned strategies.

While we have presented our hedging plan by using options and futures, there are other derivatives that are utilized to hedge commodity price risk. In the upcoming section, we will evaluate them, look into the factors to be considered when deciding which derivative to use for hedging, and give reasons as to why we formulated a hedging strategy consisting of options or futures.





TYPES OF DERIVATIVES AND FACTORS FOR HEDGING COMMODITY PRICE RISK



In the first section we understood what derivatives are. In this section, we will go deeper into the types of derivatives that companies use to hedge commodity price risk.

1. **Commodity derivatives:** These are financial instruments that draw their value from the price movements of an underlying asset. Commodity derivatives are generally used to hedge raw material prices. These derivatives trade over organized exchanges or through OTC markets. Commodity derivatives can be preferred by companies as they might offer a perfect hedge.
2. **Options:** Options are financial derivatives that give the holder the right (not the obligation) to buy or sell an asset at a predetermined price at a fix time in the future. In the context of commodity price risk, options give greater flexibility. It is also useful when the company is not certain of the direction of the movement of the price of the commodity. Options are also beneficial in the sense that the delivery of asset is not always required, and the position can be closed before expiry. Both, call and put options can be used for hedging.
3. **Swaps:** A swap is a financial instrument which leads to the exchange of one cash flow for another. A fixed-floating commodity swap allows one party to pay the current price, or notional, amount of the commodity and receive a fixed payment in return. The current price depends on the value of an index for the commodity. The hedging counterparty pays a fixed amount and receives cash flows based on the current index value. The hedging counterparty typically is a consumer of the raw material and benefits when the price rises, since it will receive more than it pays out. If prices fall, the savings in raw material costs counterbalances the money lost on the swap.
4. **Futures and Forwards:** Futures and forwards are an effective hedging tool widely used by companies to hedge commodity price risk. The dynamics of futures and forwards are straightforward where a party promises to buy / sell an asset at a predetermined price at a time in future to the counter party. This differs from option in the sense that options give the right to the holder whereas futures and forward obligate the parties to fulfill their responsibilities. Generally, companies prefer options over futures and forwards.

There are several factors that an investor or business organization must consider before deciding on the derivatives to be used in the hedging strategy. Let us have a look at them:

1. **Cost:** The Cost of the derivative is one of the most important factors that the company should consider when deciding on the type of derivative to be used for hedging. It can make or break the hedging strategy since costly derivatives will negate the positive effects of the strategy. This also includes taxes.

2. **Outlay of Capital:** The company's successes and financial health is majorly determined by liquidity and capital management. Thus, a company should select a derivative that leads to a lesser capital outlay thereby offering them more liquidity to invest in other needs.
3. **Liquidity of the Derivative:** The liquidity of the derivative instrument is a crucial factor that companies need to consider. A highly liquid product – that is a derivative product displaying significant trading volumes on the exchange will be cheaper and easier to execute.
4. **Risks:** Derivatives instruments are not risk free. Every derivative instrument has its own risks and shortcomings. For instance, forwards and futures have the risk of counterparty defaulting on their obligations. Futures are also exposed to basis risk. The cost of options is the loss of premium amount paid. Apart from this, when trading in derivatives, the company or investor is always exposed to market risk, legal risk, and counterparty risk. Thus, when a company is determining which derivative to use, it must carefully consider the risks associated with those instruments and select the one in which they can best manage the risk.
5. **Payoff of the instrument:** Another important point that companies consider is the payoff of the instrument. One must select the instrument depending upon the compatibility of the commodity and the magnitude of hedge payoff.

Every company must bear in mind these factors before deciding on the derivative used. Not only will these factors ease the process of selection but also increase the efficiency of the hedging strategy.

Our investors might question if hedging necessary considering the expertise and financial resources required. Well, as highlighted before in this report, hedging is not always necessary and can sometimes lead to an adverse outcome. However, in our case, hedging does seem to be an effective risk management strategy. Let us evaluate its benefits versus the impact of keeping our position open.





BENEFITS OF HEDGING VERSUS OPEN POSITION TO COMMODITY PRICE RISK



Hedging provides a strong argument for mitigating our exposure to commodity price risk. It not only reduces our downside but also provides stability to our business operations and cashflow management. While some of our investor might advise against it, we believe that we must implement a hedging program rather than keeping our position open. This section will provide an argument for it by listing its benefits and considering what might be the impact if we keep our position open.

1. **Cash flow benefits:** One of the major benefits of hedging commodity price risk is the cashflow flexibility that it provides. Managing cashflow is a major challenge for a company. As a result, companies must be vigilant in keeping their businesses financially viable. Fluctuating commodity prices especially on a significant part of the value chain can cause cash flow fluctuations in the business. Hence, forecasting and protecting future cash flows become vitally important. One of the advantages of hedging commodity price risk is the ability to minimize cash flow fluctuations attributed by commodity price movements. Hedging insulates the company from such volatile price movements and is poised to stabilize cash flow volatility by creating an offsetting impact in case of commodity price fluctuations – with the aim to almost achieve a zero-sum game for the commodity exposures covered under that hedge. If done correctly hedging, helps mitigate the overall exposure to fluctuating commodity price.
2. **Cost benefits:** Hedging the commodity price risk using exchange traded derivative contracts tends to lower the cost of hedging as compared to undertaking an over-the counter derivative contract for the purpose of hedging – especially where the traded derivative contract is highly liquid. This is essential for us as we do not have the necessary liberty to pass on the costs of commodity price fluctuation and hedges on to the customer – due to competition and other market pressures.
3. **Accounting benefits:** Depending on our country's accounting rules and regulations, our company can receive several accounting benefits by implementing a hedging strategy.

On the flipside, if we were to keep our positions open, we could be severely exposed to the fluctuations in the price of gas. Gas being a highly liquid and in-demand commodity, makes it prone to fluctuations. Also, the heavy capital and infrastructural investment required in manufacturing oil makes its supply limited to a few suppliers who could control its price. If market conditions do not remain normal, there is a high possibility of fluctuations in the price of the oil. This could lead to mismanagement of cashflow and a high input cost. If this were to happen and we were to keep our profitability at previous levels, it would mean to increase the price of steel and pass the increased cost to the customers. In a cut-throat market, this would mean losing out on our clients. Thus, in our case, it is always beneficial to hedge commodity price risk as it provides greater stability to our business and finances.

In the next section, we will address the remaining concerns expressed by the Investor Committee and conclude the report.





OTHER CONCERNS AND CONCLUSION



Our Investor Committee also expressed some other valid concerns pertaining to the cost of automated systems required for hedging, the management of front and back-end investment functions, lack of documentation of the process and lack of clarity on the role and responsibilities in the new framework.

With regards to the lack of experience in operating automated systems, this concern can be overcome by providing necessary training and continuously learning. Sure, it can take some time, but it is essential as it provides our company an edge over the competitors. The second concern expressed by the management needs to be dealt with seriously and on an urgent basis. A separation of front and back-end operations is essential as it reduces the risk of fraud. It also gives clarity to the employees regarding their role and responsibility. Lastly, before implementing any risk management strategy, it is essential to ensure there is proper documentation in place covering all aspects of the strategy and that there is a clear assignment of roles and responsibilities of the personnel involved in the strategy.

We hope that this report provided an overview of hedging and derivatives, suggested a detailed plan for mitigating commodity price risk through hedging, and addressed the Investor Committee's concerns. We must remember that when we deal with gas and other similar commodities as an input, hedging or any other risk management strategy is inevitable!

**THANK
YOU!**

