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The Financial Market Instruments for Risk Management in the Commodities Sector

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Abstract: Financial risk is caused by changes in commodity prices that affect the cash flows and market value of a company and therefore, its financial health and competitive position in product and labor markets. In the study the analysis was performed determining the risk of changing commodity prices. Reviewed risk management strategy changes in commodity prices. The study was proposed and discussed financial market instruments for risk management in the commodities sector. These tools include: forwards, options and swaps. The researchers conducted an analysis of the proposed financial instruments revealed their advantages and disadvantages.

Key words: Risk, commodity price risk, management, forwards, options, swaps, financial risk, financial market instruments

INTRODUCTION

This study is about managing commodity price risk. Financial risk is caused by changes in commodity prices that affect the cash flows and market value of a company and therefore, its financial health and competitive position in product and labor markets. The extent to which a company's cash flows and market value are affected by commodity price variability is called its risk exposure and often described as its risk profile.

Managing commodity price risk involves identifying and measuring the company's risk exposure, constructing policies for protecting the firm from financial risk and then implementing and monitoring those policies. Normally, the company's treasurer is responsible for risk management. In recent years, the task has become one of the most important functions of the treasurer's office.

MATERIALS AND METHODS

Theoretical basis of research were the research of Russian and Foreign scientists and specialists, the theological concept of different historical periods in finance and risk management. The methodological basis of research is the dialectical method of cognition, systemic and process approaches, methods of analysis and synthesis, generalization, logical and statistical methods of evaluation. Also there were applied methods of economic and mathematical modeling.

Theory: Financial risk can best be thought of as the variability in cash flows and market values caused by unpredictable changes in commodity prices, interest rates and exchange rates. Sometimes, the changes bring "good news" at other times, "bad news" (Ajupov *et al*., 2015a, b).

Usually, firms are most concerned about bad news out-comes because bad news events can severely damage the financial viability of the company and its competitive position in product and labor markets. So, firms often concentrate their risk management efforts on reducing the company's likelihood of experiencing financial distress while maintaining the company's ability to take advantage of any specialized skills or internalized knowledge management has about taking open positions (risk exposures) in certain markets (Ajupov *et al*., 2015a, b).

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Commodity price risk refers to the effects unexpected changes in commodity prices have on the income, cash flows and market value of a company.

Commodity prices change because of changes in underlying supply and demand what are called changes in real prices-and changes in the overall nominal price level-inflation. Note that periods of relative calm and relative turbulence exist in the time series. This pattern of changing volatility characterizes the price behavior of most commodities and financial assets (Glukhov, 2007).

Which sectors are exposed to Commodities Risk? Generally, producers of following sectors are mostly exposed to price falls which means they receive less revenue for commodities they produce:

- Mining and minerals sector like gold, steel, coal, etc.
- Agricultural sector like wheat, cotton, sugar, etc.
- Energy sectors like oil, gas, electricity, etc.
- Consumers of commodities like airlines, transport companies, clothing and food manufacturers are primarily exposed to rising prices which will increase the cost of commodities they produce
- Exporters/importers face the risk from the time lag between order and receipt of goods and exchange fluctuations

In a company such risks should be appropriately managed so that they can focus on their core operations without exposing a business to unnecessary risks.

RESULTS AND DISCUSSION

Measurement of risk requires a structured approach across all strategic business units like production dept, procurement dept, marketing dept, treasury dept, department of risk. Given the type of commodity risk many organizations will not only be exposed to a core commodity risk in which they are dealing but may have additional exposures within the business (Shen, 2015).

For example: a commodity producer such as steel is obviously exposed to movements in steel prices, however, the changes in Iron ore, coal, oil prices and natural gas prices also affect the profitability and cash flow. In addition, if any imports or exports happen, then the movements in the currencies also have an impact on the profitability/cash flow.

Sensitivity analysis is done by choosing arbitrary movements in commodity prices or basing commodity price movements in past history.

For example: a copper mining company will calculate the risk on the basis of how much it loose or gain based on the downward or upward movement of copper prices and related input commodities to make copper.

In a portfolio approach, the company analysis commodity risk along with a more detailed analysis of potential impact on financial and operating activities (Aupov, 2007).

For example: organization that is exposed to changes in crude oil prices in addition to scenario testing of changes in crude oil prices also analyze the potential impact of the availability of crude oil, changes in political policies and impact on operational activities by any one of these variables.

In portfolio approach, the risk is calculated utilizing stress testing for each variable and combination of variables. The most appropriate method of managing risk depends on organization to organization and depends on following factors:

- Process of production
- Strategies adopted by company in marketing
- Sales and purchases timing
- Hedging products available in market (Costantino *et al*., 2016)

Large companies with greater commodity risks will often appoint financial institutions or risk management consultants to manage risk through financial market instruments. Risk management strategies are being implemented in two angles:

- Commodity producers
- Buyers of goods (Schone and Spinler, 2016)

Commodity risk management strategies for producers

Diversification: In the case of diversification, the producer generally, rotates his production (either rotation through different products or rotation of production facility of the same product) to manage the price risk or cost risk associated with production. While adopting diversification producer should ensure that alternative product should not subject to same price risk.

Diversification example: In the case of a farm business, rotation of crops to produce different products can greatly reduce the large loss from price volatility (Li and Chu, 2014).

While adopting the diversification producers may incur significant costs in the form of reduced efficiencies and lost economies of scale while resources are diverted to a different operation.

Flexibility: It is a part of a diversification strategy. Flexible business is one that has the ability to change in line with market conditions or events that may have an adverse impact on business.

Flexibility example: A steel company in falling prices scenario may instead of producing steel using coal may use low cost pulverized coal which has the same affect with lower cost. This flexibility has effect of improving financial performance.

Commodity risk management strategies for buyers of goods.The methods of managing commodity price risk for the business of purchasing commodities.

Supplier negotiation: In this buyer approaches supplier for an alternative pricing plan. They may lower prices on increased volume purchases or offer alternatives or may suggest a change to supply chain process.

Alternative sourcing: In this buyer appoint an alternative producer for getting same product or approach a different producer for substitute product in the production process. Companies generally have strategies in place to review the use of commodities within the business are risk compliant.

Production process review: In this company usually review the use of commodities in production process regularly with a view to change the mix of products to offset commodity price increases (Broll *et al*., 2013).

Consider financial market instruments for risk management in the commodities sector. Forward contracts and OTC options which are primarily trade-related instruments; as these contracts incorporate high credit risks, they are used only when trading partners have mutual confidence in each other. Forward contracts can also help in obtaining short-term export financing (Fraser and Simkins, 2011).

Forward contracts are agreements to purchase or sell a specified amount of a commodity on a fixed future date at a predetermined price. Physical delivery is expected and actual payment occurs at maturity (the future date that has been agreed to in the contract).

If the actual price at maturity (the spot price) is higher than the price in the forward contract, the buyer makes a profit and the seller suffers a corresponding loss. If, on the other hand, the spot price is lower, then it is the buyer who loses and the seller who profits.

A major advantage of forward contracts is that the establishment of a predetermined price eliminates the risk of price changes for both the buyer and the seller.

Forward contracts are relatively old risk management instruments but their origins are not clear. Presently, most forward trade is OTC with transactions being made directly or through brokers and dealers by telephone, telex and fax (Malik, 2010).

While many OTC forward markets for commodities are not very liquid (that is they register low trading levels) a few such as the Brent forward market for crude oil and those for several fuel products are liquid.

Forward markets for major currencies are also liquid and there is keen competition among institutions over forward quotations for transactions with maturity of up to 1 year. Elements of a forward contract are presented.

Elements of a forward contract: An agreement to buy or sell one currency for another. The currency exchange rate that is fixed at the moment of conclusion of the contract. The execution of the contract (supply of currency) is carried out at an agreed time in the future, either at a specific date or between two specified dates depending on the terms of the contract.

The value of a forward position at maturity depends on the relationship between the delivery price (K) and the underlying price (St) at that time. For a long position this payoff is (Fig.1):

$$ft = St - K \quad (1)$$

For a short position it is (Fig.2):

$$ft = K - St \quad (2)$$

Since, the final value (at maturity) of a forward position depends on the spot price which will then be prevailing, this contract can be viewed, from a purely financial point of view as "a bet on the future spot price".

Figure 1 and 2 present the payoff patterns on long and short positions in a forward contract, respectively. It is important to note that the payoffs are linear in the underlying spot price.

Also, the positions are symmetrical around the horizontal axis. For a given spot price, the sum of the profit or loss for the long and the short is zero. This reflects the fact that forwards are private contracts between two parties. Forward contracts have their advantages and disadvantages they are presented in Fig. 3.

Options are risk management instruments that do not lock in prices but protect those who buy them against unfavourable price movements while retaining the possibility of profiting from favourable ones. An option

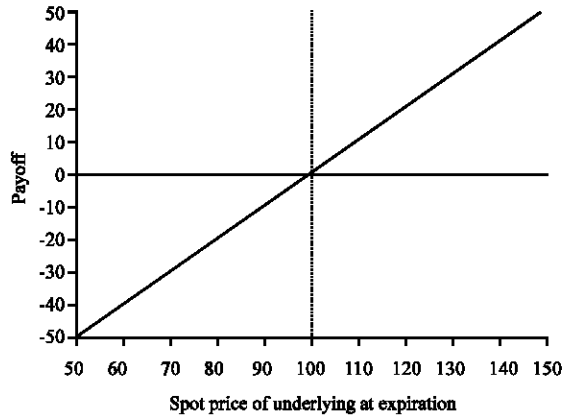

Fig. 1: Payoff of profits on long forward contract

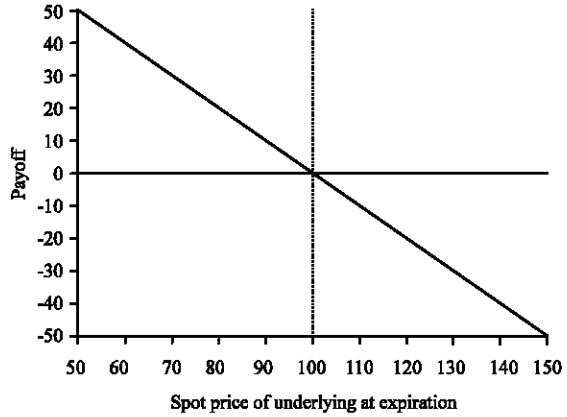

Fig. 2: Payoff of profits on short forward contract

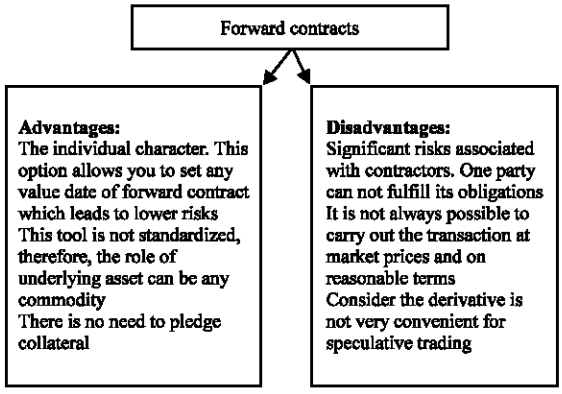

Fig. 3: The advantages and disadvantages of forward contracts

contract is the right (but not the obligation) to purchase or sell a certain commodity at a pre-arranged price (the «strike price») on or before a specified date. For this contract, the buyer or seller of the option has to pay a

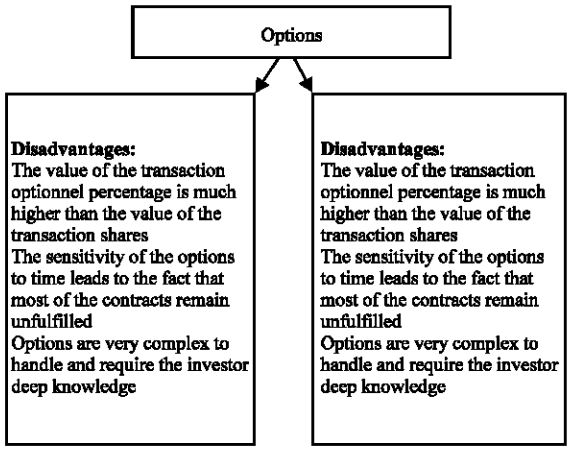

Fig. 4: The advantages and disadvantages of options

price to his counterpart at the time of contracting which is called the "premium"; if the option is not used, the premium is the maximum cost involved. If an option gives the right to buy at a pre-set price, it is termed a "call option" (Priovolos and Duncan, 1991).

This right to buy at a pre-set price is attractive for those who think that the market price will increase: it will enable them to buy at the lower price. It gives price protection to consumers and to processors and traders for the cost of the commodities they purchase. If an option gives the right to sell at a pre-set price it is a "put option". This protects the seller against a price decline.

Options can give the right to buy or sell a certain amount of a physical commodity or, more commonly, they can give the right to buy or sell a futures contract. This sounds like an unnecessary complication but in effect it avoids the complicated delivery problems that characterize options on physicals (Furlong *et al*., 2017).

The date on (or before) which the buyer can chose to buy or sell the commodity or the futures contract is called the "maturity" or «expiration» of the option contract.

For exchange-traded options, the date is usually similar to the maturity date of the underlying futures contracts while on the OTC market a wide variety of maturities going up to five years can be found. Options have their advantages and disadvantages they are presented in the Fig. 4.

Swaps between intermediaries and producers and commodity-linked loans and bonds which are instruments through which in many cases elements of price hedging are combined with financial deals. Swaps are often used to make the repayment of loans or investments more secure (although, they are also used as pure hedging instruments) while the primary aim of commodity-linked

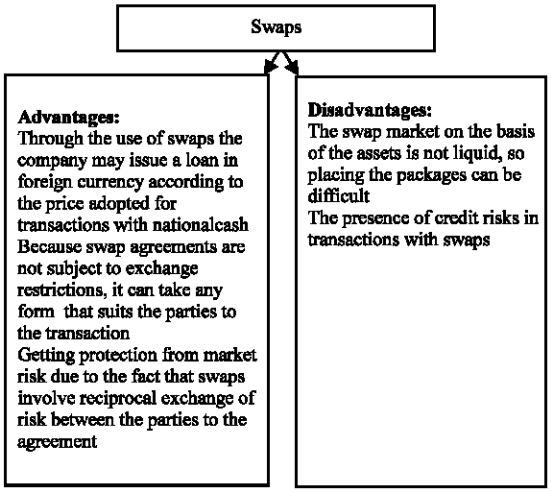

Fig. 5: The advantages and disadvantages of swaps

loans and bonds is to raise finance (Ajupov and Polteva, 2014). Swaps have their advantages and disadvantages they are presented in the Fig. 5.

A swap is a derivative in which two counter parties exchange cash flows of one party's financial instrument for those of the other party's financial instrument. The benefits in question depend on the type of financial instruments involved. For example, in the case of a swap involving two bonds, the benefits in question can be the periodic interest (coupon) payments associated with such bonds. Specifically, two counter parties agree to exchange one stream of cash flows against another stream. These streams are called the legs of the swap.

The swap agreement defines the dates when the cash flows are to be paid and the way they are accrued and calculated. Usually at the time when the contract is initiated at least one of these series of cash flows is determined by an uncertain variable such as a floating interest rate, foreign exchange rate, equity price or commodity price.

CONCLUSION

Many enterprises exposed to such financial risk as the risk of changes in commodity prices. Through such financial instruments as forwards, options and swaps businesses can these risks be minimized. But be aware that the use of a particular financial tool has its shortcomings.

Therefore, managers must constantly analyze and assess financial risks, to choose the optimum methods of risk management for the company and constantly monitor risks.

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