

# Importance of Role of Financial Derivatives in Risk Management for business exchanging

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## Abstract

The goal of risk management is to manage risk, which involves picking the risks that the business is most at ease with and reducing the ones that it does not want. Financial derivatives were helpful in achieving risk management goals. Risks from conventional instruments may be effectively unbundled and controlled separately by using derivatives. Derivatives may save expenses and boost profits when used properly. Financial derivatives can be used to speculate by taking positions in anticipation of market movement or to hedge against undesirable risk. Organizations may now deliberately seek out certain risks and bet on the direction of interest-rate or exchange-rate fluctuations using financial derivatives, or they can use derivatives to protect themselves against unwelcome risk. Derivatives trading help improve market liquidity, raiseskills and knowledge among market players, and are vital ingredient of market reforms such as thetransition to rolling settlement. Derivatives trading include Futures contract, Option Contract, IndexFutures,IndexOptions,CommodityDerivatives,andSwaps. Whensusingfinancialderivatives,however, organizations should be careful to use only those instruments that they understand and that fitbest with their corporate risk management philosophy. The main objective of this paper is to study theimportance of derivative in risk management of the business.

**Keywords:** Derivatives, forwards, futures,options, swaps.

## Introduction

Various people define risk in terms that have different implications (Adams, 2014). People have different ideas on what the term "risk" means. The word "risk" is frequently used to refer to a variety of concepts (Rajic, 2015). According to Johansen and Raus (2014), if you asked individuals what they understood by the term risk, you would likely get a variety of answers. Risk was defined as an occurrence having unpredictability, severity, and results of an activity that humans value by Aven and Renn (2009). Rajic (2015) defined risk as the likelihood that an employee would be hurt. Risk then arises when the outcome does not turn out as predicted. There are two types of risk: internal risk and external risk. Internal risks are controllable while external risks are not in our control. Risk management refers to the process of understanding, mitigation and sharing of risk. Risk management plays a key role in the financial industry and an integral part of it. Markets andrisk management practices grow with the progress of business. The growth of the business and marketexpansion pose challenges for managing the risk. As a result, financial instruments evolved to managethe risks which are known as financial derivatives. Rao (2012) stated that derivatives are contracts wheretheyields of contracts depend upon underlying value. The underlying canbeaninterestrate,commodity or currency. Emira Kozarevic et al. (2014) defined the derivatives as securities whose valuesdepend upon the underlying assets. The assets can be a commodity, bond, foreign exchange rate, stockand weather disaseters (Hanic, 2014). Malleswari (2013) stated that there are different forms of contractbutmost commonformsincludefutures, forwards, options andswaps.

Financialderivativeisatoolusedbythecompaniestomanagetherisk.Insimpleword,itisused to hedge the risk which is being faced by the company. There are two importantfunctions whichare played by the financial derivatives namely hedging and speculation. Hedge instruments are usedwith an attempt to reduce the risk level attached with the underlying transactions (Hausin et al., 2008).Hedgers protect their assets or liabilities from the adverse change by entering into derivative contract.Speculation presumes the financial risk with the prediction of gain from market fluctuations (Dunbar,2016). Hedging and speculation are thetwo sides of same coin (Chui, 2012). Therefore, financialderivative play key role for managing risk. The efficient use of financial derivatives reduces risk levelandincreases rateofreturn. Thus,it isimprovingthefinancial healthofbusinessand climate.

It has been noted that almost all firms either operating domestically or globally, they face somekind of risks. The risks facing by firms might be interest rate, foreign exchange, commodity, credit,liquidity, operational and market risk etc. The risk could be controllable or beyond the limits of firms.Similarly, it could be managed internally or through some external channel.

Whether the firms develop its own risk management procedures or outsource this activity. The main concern of the firm is to manage the risks in such a way that foster its operating activities and increase its return. Therefore, it is deemed necessary to introduce such instruments in market that help to achieve the desired objectives. As a result, financial instruments are introduced that help the firm to manage their risks in such a way that reduce its costs and maximize the return. It has been witnessed that usage of derivatives instruments increased in order to manage the risk domestically and globally. Financial derivatives are categorized into two forms over the counter and exchange traded derivatives (Emira Kozarevic et al. (2014).

Paul Embrechts et al. (2006) defined the market risk as the risk that will change the investment value resulting from the movement of market risk factors. Market risk is a risk which is faced by the Commercial banks, investment banks, financial institutions, insurance companies, non-financial institutions and all the other firms which are operating domestically and globally. Firms concern are to manage the market risk at such level that it increases the firm values and save its costs. Market risk can be categorized into equity risk, interest rate risk, commodity risk and exchange rate risk. However, market risk can be easily differentiated from other types of risk especially from operational risk and credit risk. The importance of market risk cannot be ignored due to increase in the number of transactions across country borders.

The existence of market imperfection, financial distress situation, agency problems, and taxes are costly for a firm which lead a firm to hedge their risk that increase the firm value (Muller and Verschoor, 2005). Financial distress situation occur when a firm unable to pay its financial obligations. But, using the derivative instruments reduces its costs. Thus, firm with low liquidity and high leverage position can get the incentives through financial derivatives by hedging its risky activities. Agency problem arises due to the conflict between manager and shareholders which lead towards underinvestment problem. The issue can be resolved with the help of hedging which redistribute the cash. Similarly, firms having convex tax liabilities have an incentive for using the financial derivatives. Because, under convex functions, profitability of firm is close to zero. So, it is in the interest of firm to use hedging activities to mitigate its risks. The paper will primarily deal with the market risk and will attempt to answer the questions that what is market risk? How to measure the market risk? What are the methods to measure the market risk and how to manage it?

## Literature Review

The role of financial derivatives in risk management has been extensively studied by researchers. Chaudhury (2016) conducted a study on market risk and conservative VaR form with the aim to find out its reason. It is argued in the study that stress VaR which is added in the Basel III is overly conservative. The evidence is obtained by comparing the extended value at risk, pre VaR and new VaR. Trencu et al. (2015) conducted the study on market risk assessment from the perspective of financial crisis. They stated that managers require the information in advance about the market volatility and its impact on portfolio losses. VaR has been used as statistical tool for measuring the market risk as recommended by Basel Committee for providing the required capital in order to cover the risk. Koksal and Orhan (2012) investigated the study on emerging economies and market about market risk analysis by using the VaR approach. The performance of the VaR method has been examined as a tool of market risk measurement. The results revealed that performance of VaR is less pronounced in developed economies relative to emerging economies. It is recommended by authors that the VaR method as well as other methodology for measuring the market risk for correct risk management.

Uyungco and Li (2015) examined a study on the evaluation of value at risk model and its effectiveness by taking the evidence of Australian banks. The study focused to determine whether the selection of parameters and methodology help the banks during crisis for holding an adequate capital. Although, large criticisms had been made on the VaR over downside risk but historical model and one year parameter of VaR give the better estimation as compare to the long term. The finding revealed the high violation of VaR estimation under the simulation of Monte Carlo.

Simone Varotto (2011) investigated the new capital criteria and its impact on trading portfolio as directed by the Basel III committee. Stressed VaR and pre crisis VaR have been used in order to estimate the requirements of capital for the portfolio of corporate bonds as traded. The results are obtained by estimating the VaR under the condition of stress during the period of crisis and it revealed that market risk is associated with the portfolio of corporate bond. In a study of Acharya and Richardson (2009), expected short fall and VaR have been recommended for the division of aggregate losses associated with different components. These approaches will be useful and provide the estimation of marginal expected short fall of banks under collective shocks and its contribution in aggregate risk. Alexander and Sheedy (2008) formulated a methodology in order to investigate the market risk under stress conditions which contain both the fat tails and volatility. The increase in the relevance statistics and target probability can be obtained with the help of these tests.

Li and Marnic (2014) examined the use of financial derivatives of US bank holding companies. They find that systematic exposure of Bank holding companies is significantly and positively associated with the usage of financial derivatives. There is an increase

in the systematic of credit, exchange rate and interest rate risk due to greater usage of credit, exchange rate and interest rate derivatives. Moreover, there is persistence positive association between the derivatives for hedging and trading with risks. Vuilleme (2015) investigated that how the commercial bank manage the interest rate risk through derivatives. He stated that derivatives are used as a substitute in risk management in order to ensure the financial stability. He also reported that derivatives users enjoy the lending opportunities and hold the better position in good time. In addition to this, all the banks do not take the derivative position despite the appealing features of derivative contracts.

Emira Kozarevic et al. (2014) conducted a study on derivatives usage for risk management in emerging economies by taking the evidence of non-financial firms of Herzegovina and Bosnia. They showed that banks play an important role in the over the counter market by offering the various kinds of derivative instruments. They explicitly stated that there is low demand for the use of derivatives due to the lack of knowledge about derivatives benefits and less business operations in global markets. Gibson (2007) analyzed the relationship between credit derivatives and risk management from the perspective of commercial banks, investment banks and investors. He described that market users use the credit derivative as an important instrument for risk management. The risk on the offered loans is managed through credit derivatives by the commercial banks. The investment banks manage the underwriting securities risk with the help of credit derivatives. Similarly, the risk of credit exposure is aligned with the credit risk profile through the use of credit derivatives by investors. He also reported the challenges of model risk, counterparty risk, rating agency risk and settlement risk being posed by the credit derivatives during risk management.

Malleswari (2013) studied the derivatives role in risk management practices. He stated that change in the technology and growth of the international trade increase the volatility in market. As a result, demand of derivative instruments increase for better risk management. He also reported the three benefits of derivatives such as risk management, discovery of price and improved liquidity position. He described that why the credit derivatives are viewed negatively. It is not because of the instrument but due to the reason that how they are traded and used in the market. Financial derivatives are used as a hedging method that helps the organization to exchange the risk from one group to another group. The different strategies are used by organization in order to manage the risks which face in business life.

Rao (2012) examined the derivatives and its role in risk management. He found that risk management objectives can be fulfilled through the financial derivatives and risk raised from the traditional instruments can be managed independently through derivatives. He stated that derivatives can be used for hedging and speculation in volatile market. He also described that derivatives improve the liquidity position and performed the vital role for market reform. Organizations should be careful while selecting appropriate financial derivative for risk management. Because, financial derivatives help to save cost and increase return, if used correctly. Chui (2012) investigated the participants and products of derivatives markets. He found that global financial system and change in it invented the derivatives. He stated that using the financial derivatives improve the system and reward the incentive to users economically, if managed properly.

Masry (2006) conducted the study on the usage of derivatives for UK non-financial firms and its risk management practices. The study aimed to find out the reasons for using the derivatives as well as not using it for risk management. The study results revealed that small and medium firms did not use the derivatives as much as the large firms used. Similarly, derivatives are largely used and practiced by public companies instead of private companies. The results also indicated that most of firms did not use derivatives due to insignificant exposure and its disclosure as required by FASB rules. The study reported that derivatives are widely used to manage the foreign exchange and interest rate risk. He also found that cash flows volatility is main reason for hedging. Afza and Alam (2011) analyzed the factors of FX derivatives which affect on the non-financial firms decision making. Logit model and non-parametric tests applied in order to obtain results. They found that FX derivatives are used by those firms having foreign sales in order to reduce the exposure of foreign exchange rate. The firms of large size with financial distressed positions and financial constraints are more potential firms to use the foreign exchange rate.

Sprcic (2007) examined the derivatives roles in risk management practices by taking the evidence from large non-financial firms of Slovenian and Croatian. The study concluded the findings and disclosed that swaps and forwards are essential derivatives in Slovenian and Croatian. He also uncovered that future contracts are important for the companies of Slovenian as compared to the companies of Croatian, while over the counter options and exchange traded instruments are not essential for both countries in order to manage the risk. The comparative study also gave the evidence that companies of Slovenian use all kinds of instruments in order to manage their risks than Croatian companies. The decision to use derivatives depends upon the company size in Slovenian

companies whereas Croatian companies make the decision of derivatives usage on the basis of investment expenditure to asset ratio. Selvi and Turel (2010) conducted the comparative study on Turkish banks and non-financial firms over the usage of derivatives for risk management. The study aimed to find out that how non-financial firms and banks listed in Istanbul Stock exchange disclosed derivatives information and its accounting treatment. The study reported that listed non-financial firms (35%) and

deposit banks (85%) use derivatives. The study also revealed that deposit banks widely practice the swaps to hedge their risks and thereafter exercise the forward contracts, while, non-financial companies follow the forward contracts in order to mitigate their risks. Derivatives contracts are mostly made between deposit banks. The results also indicated that 39 percent of deposit banks used the futures instruments whereas only 11 percent of non-financial companies used it. The study reported that deposit banks and non-financial companies use the derivatives in order to hedge their foreign exchange and interest rate risk. Moreover, deposit banks play vital roles as speculators than non-financial companies.

Kapitsinas (2008) examined derivatives contracts usage of non-financial firms for risk management by taking the evidence from Greece. A survey was sent to 110 non-financial firms for the purpose of collecting data and information about derivatives usage. The study results reported that mostly interest rate is hedge through derivatives contracts and thereafter foreign exchange risks by non-financial firms. Moreover, firms didn't seem to control its risks pertaining to equity. The large size of non-financial firms widely practice derivatives in their routine transactions as compared to small size non-financial firms. The finding indicated that 33.9 percent of non-financial firms used financial derivatives to manage their interest rate risk. The disclosure of information's and accounting treatments were major concerns for derivative users. The non-financial firms followed the risk assessment process with sophisticated techniques and used the derivatives under documented corporate policy. The other non-financial firms which did not use derivatives due to inadequate risk exposure.

Fantini (2014) explored the comparative study of financial derivatives usage of non-financial firms by taking the evidence from Italy and United Kingdom. The study focused to find the hedging determinants and its types used for hedging purpose. The findings reported that use of derivatives placed high costs which is unaffordable for businesses operating at small scale. The fx rate is significant for UK sample and insignificant for Italy due to their trade within European countries. However, interest rate is relevant for both countries. Both countries manage the interest rate risk through financial instruments. The small and medium firms exposed to long term debt which result high exposure of interest rate. The high interest rate exposure placed high cost of borrowing which could expose the financial distress situation. As a result, firms operating at large scale move to hedge their risks. The study found that interest rate is significant for both countries. It also reported that firm's size is core variable with respect to derivative adoption and its incentives.

## Theories and Methods

### Portfolio Theory

Before the development of the portfolio theory, investors make the investment decision on the basis of return and ignore the risk factor. But, Markowitz (1952, 1959) originated the portfolio theory for risk measurement which postulates that investors will make decision on the basis of expected return between portfolios. Portfolio risk can be measured with the help of standard deviation. Similarly, focus will be on the individual asset risks (Grant, 2001). So keeping the other things constant, an investor will choose portfolio which give maximum return with smallest standard deviation and such portfolio is called as an efficient portfolio. A rational investor will always find a portfolio which meets that conditions and will choose the efficient portfolio. Some efficient portfolios possess more risky elements that will give the expected return higher as compare to least risky. Therefore, a risk averse investor will choose a portfolio which give small expected return and small standard deviation. On the other hand, an investor with less risk averse nature will go for a portfolio having higher expected return.

### Capital Market Theory

The theory developed by Sharpe and Lintner (1964, 1965) and refined by various scholars such as Black and Merton. When the discussion of Markowitz theory ends then capital market theory begins. The final output of the theory is Capital Asset Pricing Model. The model contains market and individual stocks portfolio and finds out the required rate of return by pricing risky assets. The assumptions of the capital market theory are same of portfolio theory with some additional. However, ignoring those assumptions might have a minor effect on conclusion. Risk free asset lead the portfolio theory into the introduction of capital market theory. Therefore, risk free asset having zero variance is main factor for the development of capital market theory.

### Arbitrage Pricing Theory

The arbitrage pricing theory was introduced by the Ross in 1976 as an alternative to CAPM. The theory has less assumption as compare to CAPM and also overcome the weakness of Capital Asset Pricing model as well. The arbitrage pricing model measures potential assets ability to produce the profit or loss. The model attempts to relate the expected rate of return with the sensitivities factor of the primitive securities. Therefore, factor model is the core ingredient in APT, whereas multifactor model have an ability to measure the systematic risk of an asset. It asserts that expected return of an asset has linear

relationship with covariance of random variables. The covariance is a risk that diversification does not allow an investor to avoid it (Huberman and Wang, 2005).

### Extreme Value Theory

Avdulaj (2011) stated that the extreme value theory take into the account of those events which have high severity and low frequency. In simple word, it focuses on the event whose probability for occurrence is very low but impact could be catastrophic. The threshold exceedances and block maxima are the two main approaches for modeling the extreme value theory. Traditionally, the management of market risk was depending upon the nominal values of individual positions. The risk exposure of financial instruments and its nominal values were directly proportional to each other (Resti and Sironi, 2007). The modern approach to measure the market risk is Value at Risk (VaR), Expected Shortfall and stress testing.

### Value at Risk (VaR)

It attempts to determine the portfolio loss under distress situation. It is an approach which measures the market risk on the basis of loss distribution (Avdulaj, 2011). The VaR does not fulfill the purpose if it does not have probability and risk horizon specification. The time horizon for the loss could be a day, month, quarter or year. The VaR helps to answer the question that how much the things get bad. The importance of the VaR can be seen as that it becomes the part of Basel Committee which bound the bank to test their VaR model on regular basis. There are three approaches which are followed in order to calculate the VaR named as Historical, Monte Carlo and Analytic.

### Expected Shortfall

The expected shortfall helps to answer that if things get bad then how much a company expect to lose it. It is also known as Conditional Value at Risk (CVaR). The expected shortfall has two parameters confidence level and time horizon which is measured in term of days. So, it is closely connected with Value at Risk but express better that what could be happened in worst case. Therefore, it is more natural approach to measure the risk as compare to VaR by giving the greater visibility over tail loss distribution.

### Stress Testing

Stress testing is an approach which based on the stimulation technique of computer for measuring the market risk for certain time period under the conditions of abnormal market. Hughes and Macdonald (2002) stated that stress testing gives the summarized information of firm's extreme exposure under possible circumstances. Similarly, Resti and Sironi (2007) described that stress testing help to manage and identify the exceptional losses under simulated conditions by revaluating the portfolio.

### Applications

Before the development of VaR, risk had been measured with the help of Gap Analysis, Duration Analysis and Scenario Analysis (Dowd, 2002). Then, JP Morgan developed the risk metrics which help for the awareness and establishment of the VaR. The VaR set up itself as a core element for the view of financial risk and its management system (Jorion, 2007). The VaR approach is suitable for businesses who are engaged in trading but also useful for the managers of assets and financial institutions. Therefore, it is not only applied to the values of balance sheet but also to cash flows. This resultant extension of the VaR is known as Cash flow at Risk. It is used as a passive application in order to present the risk number to stakeholders.

Institutions from all over the world try to learn and use the VaR methodology as a tool of risk control as well as for measuring the overall risk exposure. The traders can complement its position limits through the limits of VaR which is helpful for risk and leverage. The exposure of the global risk can be monitored with the help of VaR by considering the diversification. The evolution of the VaR application shifted to defensive nature. Now, the VaR evolved itself at such level that helps to institutions for making decision about risk and return. Thus, VaR has been evolved as an active risk management tool. With the help of VaR, competitive position can be identified across sectors (Jorion, 2007). The allocation of the economic capital can be decided by taking into account the risk level of business. The evolution of the VaR application can be seen through the below diagram.

## Conclusion

Risk is an instance when the outcome may differ from what was anticipated. There are two types of risk: internal risk and external risk. The term "risk management" describes the procedure for identifying, reducing, and communicating risks. This is about anticipating what could happen rather than trying to predict what will happen in the future. As a result, proactive management is used instead of reactive management. The financial sector relies heavily on risk management, which is a crucial component of it. Markets and risk management techniques expand as business expands. Risk management is made more difficult by the expansion of the market and the growth of the company. Financial mechanisms have developed as a response to mitigate the risks, which are known as financial derivatives. There are different forms of contract but most common forms include futures, forwards, options and swaps.

Exchange traded derivatives are those which are traded through stock exchange. On the other hand, over the counter derivatives are those financial instruments whose terms and conditions are settled between two parties through negotiation. Although, the core purpose of derivatives are to control the certain level of risks but they are also utilized for the purpose of speculative activities by taking more risk in order to increase the return. Therefore, whether activity is trade base or over the counter, firms are in position to mitigate their risk with the help of financial derivatives. So, it is not hard to say that financial derivatives play a key role in emerging markets. There are various approaches to estimate the risk but in this paper, VaR has been used to measure the risk.

Financial derivative is a tool used by the companies to manage the risk. In simple word, it is used to hedge the risk which is being faced by the company. There are two important functions which are played by the financial derivatives namely hedging and speculation. Hedge instruments are used with an attempt to reduce the risk level attached with the underlying transactions. Hedgers protect their assets or liabilities from the adverse change by entering into derivative contract. Speculation presumes the financial risk with the prediction of gain from market fluctuations. Therefore, financial derivative play key role for managing risk. The efficient use of financial derivatives reduces risk level and increases rate of return. Thus, it is improving the financial health of business and climate.

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